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MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

HRA Stage 2 information to support an appropriate assessment

Part Three: Special Protection Areas (SPA) and Ramsar Site assessments

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Image of an offshore wind farm

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Glossary

Term	Meaning
Annex II Species	Animal or plant species of community interest, defined in Annex II of the Council Directive 92/43/EEC on the Conservation of natural habitats and of wild fauna and flora (Habitats Directive), whose conservation requires the designation of Special Areas of Conservation (SAC).
Applicant	Morgan Offshore Wind Limited.
Appropriate Assessment	A step-wise procedure undertaken in accordance with Article 6(3) of the Habitats Directive, to determine the implications of a plan or project on a European site in view of the site's conservation objectives, where the plan or project is not directly connected with or necessary to the management of a European site but likely to have a significant effect thereon, either individually or in-combination with other plans or projects.
Competent Authority	The term derives from the Habitats Regulations and relates to the duties which the Regulations impose on public bodies and individuals. Regulation 6(1) defines competent authorities as 'any Minister, government department, public or statutory undertaker, public body of any description or person holding a public office'.
Conservation Objectives	In its most general sense, a conservation objective is the specification of the overall target for the species and/or habitat types for which a site is designated in order for it to contribute to maintaining or reaching favourable conservation status of the habitats and species concerned, at the national, the biogeographical or the European level.
Development Consent Order (DCO)	An order made under the Planning Act 2008 granting development consent for a Nationally Significant Infrastructure Project.
Environmental Statement	The document presenting the results of the Environmental Impact Assessment (EIA) process for the Morgan Offshore Wind Project: Generation Assets.
European Commission	The executive body of the European Union responsible for proposing legislation, enforcing European law, setting objectives and priorities for action, negotiating trade agreements and managing implementing European Union policies and the budget.
European site	A Special Area of Conservation (SAC), possible SAC (pSAC), or candidate SAC, (cSAC), a Special Protection Area (SPA) or potential SPA (pSPA), a site listed as a site of community importance (SCI).
Evidence Plan	The Evidence Plan is a mechanism to agree upfront what information the Applicant needs to supply to the Planning Inspectorate as part of the Development Consent Order (DCO) application for the Morgan Offshore Wind Project.
Expert Working Group (EWG)	Expert working groups set up with relevant stakeholders as part of the Evidence Plan process.
Habitat	The environment that a plant or animal lives in.
Habitats Directive	The Habitats Directive is the short name for European Union Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora. The Directive led to the establishing of European sites and setting out how they should be protected, it also extends to other topics such as European protected species.
Habitats Regulations	The Conservation (Natural Habitats, &c.) Regulations 1994, the Conservation of Habitats and Species Regulations 2017 and the Conservation of Offshore Marine Habitats and Species 2017.

Term	Meaning
Habitats Regulations Assessment	A process required by the Habitats Regulations of identifying likely significant effects of a plan or project on a European site and (where likely significant effects are predicted or cannot be discounted) carrying out an appropriate assessment to ascertain whether the plan or project will adversely affect the integrity of the European site. If an adverse effect on European site integrity cannot be ruled out, the latter stages of the process require consideration of the derogation provisions in the Habitats Regulations.
In-combination Effects	The combined effect of the Morgen Generation Assets in-combination with the effects from a number of different plans or projects on the same feature/receptor.
Inter-array cables	Cables which connect the wind turbines to each other and to the offshore substation platforms. Inter-array cables will carry the electrical current produced by the wind turbines to the offshore substation platforms.
Interconnector cables	Cables that may be required to interconnect the Offshore Substation Platforms in order to provide redundancy in the case of cable failure elsewhere.
Likely Significant Effect	Any effect that may reasonably be predicted as a consequence of a plan or project that may affect the conservation objectives of the features for which the European site was designated but excluding trivial or inconsequential effects. A likely effect is one that cannot be ruled out on the basis of objective information. A 'significant' effect is a test of whether a plan or project could undermine the site's conservation objectives.
Local Authority	A body empowered by law to exercise various statutory functions for a particular area of the United Kingdom. This includes County Councils and District Councils.
Marine Licence	The Marine and Coastal Access Act 2009 requires a marine licence to be obtained for licensable marine activities. Section 149A of the Planning Act 2008 allows an applicant for a DCO to apply for 'deemed marine licence' as part of the DCO process.
Maximum Design Scenario (MDS)	The scenario within the design envelope with the potential to result in the greatest impact on a particular topic receptor, and therefore the one that should be assessed for that topic receptor.
Morgan and Morecambe Offshore Wind Farms: Transmission Assets	The transmission assets for the Morgan Offshore Wind Project and the Morecambe Offshore Windfarm. This includes the Offshore Substation Platforms (OSPs), interconnector cables, Morgan offshore booster station, offshore export cables, landfall site, onshore export cables, onshore substations, 400kV grid connection cables and associated grid connection infrastructure such as circuit breaker infrastructure.
Morgan Array Area	The area within which the wind turbines, foundations, inter-array cables, interconnector cables, scour protection, cable protection and offshore substation platforms (OSPs) forming part of the Morgan Offshore Wind Project: Generation Assets will be located.
Morgan Offshore Wind Project: Generation Assets	This is the name given to the Morgan Generation Assets project as a whole (includes all infrastructure and activities associated with the project construction, operations and maintenance, and decommissioning).
Morgan Offshore Wind Project	The Morgan Offshore Wind Project is comprised of both the generation assets and offshore and onshore transmission assets and associated activities.
Natura 2000 Network	A coherent European ecological network of Special Areas of Conservation and Special Protection Areas comprising sites located within European Union Member States.

Term	Meaning
Offshore Substation Platform (OSP)	A fixed structure located within the wind farm sites, containing electrical equipment to aggregate the power from the wind turbine generators and convert it into a more suitable form for export to shore.
Ramsar site	A wetland site designated to be of international importance under the Ramsar Convention. The Convention on Wetlands, known as the Ramsar Convention.
Special Area of Conservation (SAC)	Special Areas of Conservation (SACs) are areas designated under the European Union (EU) Habitat's Directive to help conserve certain plant and animals species listed in the Directive. Article 3 of the Habitats Directive requires the establishment of a European network of important high-quality conservation sites that will make a significant contribution to conserving the 189 habitat types and 788 species identified in Annexes I and II of the Directive (as amended). The listed habitat types and species are those considered to be most in need of conservation at a European level (excluding birds).
Special Protection Area (SPA)	Special Protection Areas (SPAs) are sites classified under the EU Birds Directive 2009/147/EC of the European Parliament and of the Council on the conservation of wild birds.to protect rare or vulnerable birds (as listed on Annex I of the Directive), as well as regularly occurring migratory species.
Species	A group of living organisms consisting of similar individuals capable of exchanging genes or interbreeding.
Statutory Consultee	Organisations that are required to be consulted by an applicant pursuant to the Planning Act 2008 in relation to an application for development consent. Not all consultees will be statutory consultees (see non-statutory consultee definition).
The Planning Inspectorate	The agency responsible for operating the planning process for development consent under the Planning Act 2008.
Wind Turbines	The wind turbine generators, including the tower, nacelle and rotor.

Acronyms

Acronym	Description
AEOI	Adverse Effect on Integrity
BDMPS	Biologically Defined Minimum Population Scales
CAP	Conservation Advice Package
DAERA	Department for Agriculture, Environment and Rural Affairs
DCO	Development Consent Order
EIA	Environmental Impact Assessment
EU	European Union
EWG	Expert Working Group
HRA	Habitats Regulations Assessment
ISAA	Information to Support an Appropriate Assessment
JNCC	Joint Nature Conservation Committee
LAT	Lowest Astronomical Tide

Acronym	Description
LSE	Likely Significant Effect
MDS	Maximum Design Scenario
MHWS	Mean High Water Springs
MLWS	Mean Low Water Springs
MMO	Marine Management Organisation
NPWS	National Parks and Wildlife Service
NRW	Natural Resources Wales
OSP	Offshore Substation Platform
PEIR	Preliminary Environmental Information Report
pSPA	Potential Special Protection Area
RSPB	Royal Society for the Protection of Birds
SAC	Special Area of Conservation
SD	Standard Deviation
SMP	Seabird Monitoring Programme
SNCB	Statutory Nature Conservation Bodies
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest
TWT	The Wildlife Trusts
UK	United Kingdom
ZoI	Zone of Influence

Units

Unit	Description
%	Percentage
km	Kilometres
km^2	Square kilometres
m	Metres
rpm	Revolutions Per Minute
MW	Megawatt

1 Habitats Regulations Assessment Stage 2 Information to support an Appropriate Assessment – Part Three: Special Protection Area (SPA) and Ramsar Site Assessments

1.1 Introduction

1.1.1 Purpose of the Information to Support an Appropriate Assessment

1.1.1.1 This Information to Support an Appropriate Assessment (ISAA) has been prepared by RPS and Niras, on behalf of the Applicant (EnBW & bp), to support the Habitats Regulations Assessment (HRA) required under Section 63 of the Conservation of Habitats and Species Regulations 2017 and Section 28 of the Conservation of Offshore Marine Habitats and Species Regulations 2017 for the Morgan Offshore Wind Project: Generation Assets (hereafter referred to as the Morgan Generation Assets).

1.1.1.2 The ISAA builds upon the HRA Stage 1 Screening Report (Document Reference E1.4) and considers the likely significant environmental effects of the Morgan Generation Assets as they relate to relevant European site integrity. This report will provide the Competent Authority with the information required to undertake an HRA Stage 2 Appropriate Assessment.

1.1.1.3 The scope of the ISAA covers all relevant European sites and designated features where Likely Significant Effects (LSEs) have been identified due to the potential impacts arising from the Morgan Generation Assets. This includes both 'offshore' European sites and features (seaward of Mean High Water Springs (MHWS)), and potential impacts of offshore infrastructure on 'onshore' European sites (landward of Mean Low Water Springs (MLWS)).

1.1.2 Structure of the ISAA

1.1.2.1 As detailed in section 1.2.6 of Part One of this ISAA, for clarity and ease of navigation, the ISAA is structured and reported in several 'Parts', as follows:

- Part One – Introduction and Background
- Part Two – Special Areas of Conservation (SACs) assessments
- Part Three (this document) – Special Protection Areas (SPAs) and Ramsar Site assessments.

1.1.2.2 Each 'Part' of the ISAA is supported by a series of topic specific appendices and relevant documentation including European site summaries.

1.1.3 Structure of this document

1.1.3.1 This document constitutes Part Three of the ISAA and provides consideration of the implications of the Morgan Generation Assets on SPAs and Ramsar sites.

1.1.3.2 This document is structured as follows:

- Section 1.1: Introduction – this section details the purpose and structure of the ISAA
- Section 1.2: Consultation – this section provides a summary of the consultation of relevance to the qualifying features of SPAs and Ramsar sites, the responses provided, and how these have been addressed within this Part of the ISAA

- Section 1.3: Summary of HRA Stage 1 Screening – this section presents the SPAs and Ramsar sites potentially at risk of LSE (both alone and in combination) and the features and pathways for which HRA Stage 2 Appropriate Assessments are required.

1.1.3.3 Information for the HRA Stage Two Appropriate Assessments is then provided in:

- Section 1.4: Information to inform the Appropriate Assessments, including maximum design scenarios, designed in measures, an outline of the approach taken to baseline data, conservation objectives and the in-combination assessment.
- Section 1.5: Assessment of potential Adverse Effect on Integrity (AEOI): Step 1. This provides a non-detailed assessment of all sites impacted by collision and displacement impacts which an apportioning report has been undertaken (Volume 5, Annex 5.5: Offshore ornithology apportioning technical report of the Environmental Statement (Document Reference F4.5.5). Some SPAs and Ramsar sites are then taken forward to section 1.6 if further assessment was found to be required.
- Section 1.6: Assessment of potential AEOI: Step 2. This provides a detailed assessment of all sites for which, following a brief assessment (using the apportioning report (Document Reference F4.5.5), further consideration was needed to conclude if AEOI would occur.

1.1.3.4 The scope of this Part of the HRA Stage 2 ISAA covers all relevant SPAs (and Ramsar sites) and relevant qualifying interest features where LSEs have been identified due to potential impacts arising from the Morgan Generation Assets. This report will provide the competent authority with the information required to undertake an HRA Stage Two Appropriate Assessment (see HRA Stage 2 ISAA Part 1 – Introduction (Document Reference E1.1) for more detail on the HRA process).

1.2 Consultation

1.2.1.1 Consultation has been undertaken with statutory stakeholders during key stages of the Morgan Generation Assets with regards to ornithological features of SPAs and Ramsar sites as part of the Evidence Plan process. Full details of the consultation undertaken for the Morgan Generation Assets are provided in the Consultation Report (Document Reference E3) and the Technical Engagement Plan (Document Reference E4). These documents contain full minutes of all expert working group (EWGs) meetings.

1.2.1.2 A summary of the consultation undertaken to date which is relevant to this Part of the HRA Stage 2 ISAA (and the consideration of SPAs and Ramsar sites), the Morgan Generation Assets and the HRA process in general, is presented in Table 1.1.

Table 1.1: Summary of key consultation relevant to the HRA Stage 2 ISAA Part 3 – Special Protection Area (SPA) and Ramsar Site Assessments for the Morgan Generation Assets.

Date	Consultee	Type of Consultation	Summary of Consultation	Where addressed
Steering Group				
November 2021	Natural Resources Wales (NRW), Natural England, Marine Management Organisation (MMO), Joint Nature Conservation Committee (JNCC) and the Planning Inspectorate.	Steering Group meeting	• Meeting purpose was to set up and establish the Evidence Plan process and to gain feedback on the EWGs • No specific discussion of the HRA process.	No action required. Please see HRA Stage 2 ISAA Part 1 - Introduction (Document Reference E1.1) for Evidence Plan Process.
July 2022	NRW, Natural England, MMO, JNCC and Planning Inspectorate	Steering Group meeting	• LSE Methodology circulated to members of the Steering Group to gain feedback and agreement on the methodology to be used.	Feedback has been incorporated into HRA Stage 1 Screening Report (Document Reference E1.4) and HRA Stage 2 ISAA – Part 3 - Special Protection Area (SPA) and Ramsar Site Assessments (Document Reference E1.3).
July 2022	NRW, Natural England, MMO, JNCC and Planning Inspectorate	Steering Group meeting	• LSE Methodology circulated to members of the Steering Group to gain feedback and agreement on the methodology to be used • Methodology approach presented included the process for identifying European sites and species where there is the potential for a LSE. The process and associated buffers used to screen in sites was presented for ornithology (onshore and offshore). • NRW advised that all European sites with named features whose foraging ranges fall within the mean maximum foraging range +1 standard deviation (Mean Max +1 Standard Deviation (SD)) in Woodward *et al.* (2019), should be scoped in and included in the screening process. • JNCC advised species specific foraging ranges (Woodward *et al.,* 2019). • In section 1.2.7.15 JNCC noted the Statutory Nature Conservation Bodies (SNCBs) advice on the spatial extent of displacement impacts to	Feedback received on the LSE screening methodology has been incorporated into the HRA Stage 1 Screening Report (Document Reference E1.4) which precedes this HRA Stage 2 ISAA – Part 3 – Special Protection Area (SPA) and Ramsar Site Assessments (Document Reference E1.3).

Date	Consultee	Type of Consultation	Summary of Consultation	Where addressed
			seaducks and diver species other than red-throated diver is 4 km, and the spatial extent of displacement impacts to red-throated diver is 10 km, making the potential ZoI at least 10 km.	
February 2023	NRW, Natural England, MMO, JNCC and Planning Inspectorate	Steering Group meeting	• Approach to LSE screening for SPAs: – The Applicant presented an updated HRA methodology as a result of feedback on the original approach to screening of SPAs • NRW responded that they would consider what has been proposed. Initial thoughts were that this may be a good way of working through the SPAs but requires further discussion with their ornithologists. NRW also wanted this to be discussed at the offshore EWG	Feedback has been incorporated into the HRA Stage 1 Screening Report (Document Reference E1.4) and has therefore influenced the sites assessed and methodology followed in this ISAA.
June 2023	NRW, Natural England, MMO, JNCC and the Planning Inspectorate	Steering Group meeting	• LSE screening and ISAA methodology updates to include change in approach to screening for SPAs. For details see information provided for the February 2023 Steering Group meeting.	Feedback has been incorporated into the HRA Stage 1 Screening Report (Document Reference E1.4) and has therefore influenced the sites assessed and methodology followed in this ISAA.
Expert Working Groups				
December 2021	NRW, Natural England, MMO, JNCC, The Wildlife Trusts (TWT), Royal Society for the Protection of Birds (RSPB)	EWG01 meeting	• Meeting to introduce the Morgan Generation Assets and to establish the EWG • Discussion of ongoing surveys, preliminary findings and the approach to baseline characterisation.	Feedback has been incorporated into Volume 2, Chapter 5: Offshore ornithology of the Environmental Statement (Document Reference F2.5) and this HRA Stage 2 ISAA Report – Part 3 – Special Protection Area (SPA) and Ramsar Site Assessments (Document Reference E1.3).
July 2022	Natural England, NRW, MMO, JNCC, RSPB and TWT.	EWG02 meeting	• Meeting to agree the approach to baseline characterisation, collision risk modelling and displacement • Opportunity for discussion of the Scoping Opinion • LSE Methodology presented and discussed to the EWG for agreement on the methodology to be used.	Feedback has been incorporated into the HRA Stage 1 Screening Report (Document Reference E1.4) which precedes this HRA Stage 2 ISAA – Part 3 – Special Protection Area (SPA) and Ramsar Site Assessments (Document Reference E1.3).

Date	Consultee	Type of Consultation	Summary of Consultation	Where addressed
November 2022	Natural England, NRW, MMO, JNCC and TWT.	EWG03 meeting	• Baseline characterisation • Baseline populations • Approach to LSE screening.	Feedback has been incorporated into HRA Stage 1 Screening (Document Reference E1.4) which precedes this HRA Stage 2 ISAA – Part 3 – Special Protection Area (SPA) and Ramsar Site Assessments (Document Reference E1.3).
February 2023	Natural England, NRW, MMO, Isle of Man, RSPB and TWT.	EWG04 meeting	• Further project updates around avian flu in 2023 survey results • LSE methodology updates as described above under the June 2023 Steering Group Meeting.	Feedback was included within the updated HRA methodology note sent to consultees and included within the Technical Engagement Plan (Document Reference E4).
June 2023	Natural England, JNCC, NRW, MMO, and Isle of Man.	EWG05 meeting	• Discussion on Section 42 (S42) comments and clarifications required • LSE methodology updates.	The S42 comments have been incorporated within the HRA Stage 1 Screening report Document Reference E1.4). An updated HRA methodology note was shared with the consultees post meeting and included within the Technical Engagement Plan (Document Reference E4).
August 2023	Natural England	Letter response to the updated HRA methodology note (included within the Technical Engagement Plan (Document Reference E4)).	• Natural England retain concerns regarding the approach to non-breeding season LSE screening. Natural England do not consider it appropriate to consider breeding season foraging ranges to identify sites for consideration in the non-breeding season • Natural England advise that the Applicant reviews the approach taken in the Morecambe Generation Assets Preliminary Environmental Information Report (PEIR). In this case, potential connectivity (and thus, LSE if there is an impact pathway) has only been assumed for cases where the contribution of an SPA population is thought to represent >1% of the Biologically Defined Minimum Population Scales (BDMPS) population. This provides a proportionate and sensible screening approach to reduce the site/species combinations for consideration, while ensuring those that may be at risk are properly considered.	Comments noted and the approach proposed by Natural England for screening of non-breeding birds has been adopted in the HRA Stage 1 Screening Report (Document Reference E1.4).

Date	Consultee	Type of Consultation	Summary of Consultation	Where addressed
August 2023	NRW	Email response to the updated HRA methodology note (included within the Technical Engagement Plan (Document Reference E4)).	• NRW generally advise that for seabird species covered by Furness (2015) all sites within the relevant species-specific BDMPS region are screened in at the LSE stage due to connectivity during the non-breeding season and there being potential impact pathways • NRW suggest that the Applicant considers the approach taken in the Morecambe Generation Assets PEIR where potential connectivity has been assumed for SPA populations that contribute >1% of the BDMPS population. • In addition, NRW advise that where the Morgan Generation Assets sit within the broad migration fronts (as defined in Wright *et al*., 2012) of non-breeding waterbird features of sites and there is hence potential for collision, these sites should also be screened in for LSE and taken through to the Stage 2 ISAA. The relevant Welsh sites were identified in NRW's response to the PEIR. NRW note that it is likely that once the predicted collision risk impacts have been apportioned to the individual sites, these sites could most likely be considered at Step 1 of the Stage 2 ISAA.	Comments noted and the approach proposed by NRW for screening of non-breeding birds has been adopted in the HRA Stage 1 Screening Report (Document Reference E1.4).
October 2023	Natural England, JNCC, NRW, RSPB TWT, Isle of Man Government, MMO, Niras	EWG06 meeting	• The HRA process was not specifically discussed. • Use of avoidance rates was discussed and the difference between the applicant's and the EWG's opinion of which rate to use was explored. The applicant requested a clarification/justification of the EWGs opinion to use species group avoidance rate (see line below).	Both species group and species specific avoidance rates are considered in the assessments presented.
October 2023	JNCC, Natural England and NRW	Letter response to the request for clarification on rationale for species group avoidance rate.	• JNCC, Natural England and NRW provided a note clarifying the rationale for their preference for using the species group avoidance rate, over the species specific rates.	Both species group and species specific avoidance rates are presented within this document as discussed at EWG 06. An impact is taken through for further assessment if either of the impacts, when using the species group or species specific avoidance rate, results

Date	Consultee	Type of Consultation	Summary of Consultation	Where addressed
			• The consultees consider the species group avoidance rate to be more precautionary.	an impact above the thresholds set out in the methodology.
December 2023	Natural England, JNCC, NRW, RSPB TWT, Isle of Man Government, MMO, Niras	Offshore ornithology EWG07 meeting	• Results of the LSE process were presented for lesser black-backed gull as an example species. • Consultees indicated that they believed there was a low risk of an AEOI from the project alone	No action required.
March 2024	Natural England, RSPB, MMO, JNCC, TWT, Isle of Man Government	Offshore ornithology EWG08 meeting	• Presentation of final impact assessment and HRA. • Discussion on remaining outstanding agreements.	No action required.
S42 Consultation				
June 2023	NRW, JNCC, Natural England	S42 Consultation	• Consultees do not agree with the use of stable age structures for age-class apportioning or the removal of sabbaticals from impacts in the PEIR. • Consultees do not consider it appropriate to base the cumulative (and hence also in-combination) assessments on so many unknowns for impacts from many of the relevant other projects. Whilst these historic projects may not have undertaken quantitative assessments, or assessments using current approaches, estimates will need to be generated for these unknown projects in order to undertake meaningful assessments • The combined impact of displacement plus collision risk for the Morgan Generation Assets alone should be undertaken for black-legged kittiwake and northern gannet. • Consultees did not agree with the HRA method presented within the PEIR documentation.	New HRA method presented to the EWG (at Offshore ornithology EWG05 meeting) which addressed the concerns and comments provided by NRW, JNCC and Natural England. New method used within this HRA Stage 2 ISAA – Part 3 – Special Protection Area (SPA) and Ramsar Site Assessments (Document Reference E1.3) in line with Volume 2, Chapter 5: Offshore ornithology of the Environmental Statement (Document Reference F2.5) following the S42 consultation response. The Applicant has followed the methodology for in-combination assessments applied for previous offshore wind farm projects providing as much information for all projects of relevance to the in-combination assessments required,

Date	Consultee	Type of Consultation	Summary of Consultation	Where addressed
June 2023	RSPB	Section 42 Consultation	• Main breeding seabird species of interest to the RSPB include Manx shearwater, gannet, kittiwake, guillemot and razorbill along with non-breeding red-throated diver and common scoter. RSPB also have concerns with breeding lesser black-backed gull.	All species suggested by the RSPB have been considered as part of the HRA process and incorporated into this HRA Stage 2 ISAA – Part 3 - Special Protection Area (SPA) and Ramsar Site Assessments (Document Reference E1.3), where applicable.

1.3 HRA Stage 1 Screening conclusions

1.3.1 Overview

1.3.1.1 This section summarises all pathways identified for potential LSE (arising alone and/or in-combination) and defines the scope of the Stage 2 assessments within this Part of the HRA Stage 2 ISAA Report. The screening methodology has been agreed by JNCC and Natural England (see Technical Engagement Plan (Document Reference E4)).

1.3.2 Screening outcomes for the Morgan Generation Assets alone

1.3.2.1 The potential for LSE as a result of the Morgan Generation Assets was identified in the HRA Stage 1 Screening Report (Document Reference E1.4) with respect to 35 SPAs with offshore ornithological features and three Ramsar sites. The three Ramsar sites (Morecambe Bay, Ribble and Alt Estuaries and Isles of Scilly) will be assessed alongside the corresponding SPAs due to the features of each Ramsar site also forming part of the SPA designation.

Offshore ornithological features

1.3.2.2 As detailed in the HRA Phase 1 Screening Report (Document Reference E1.4), a total of 35 SPAs designated for ornithological features were advanced to the HRA Stage 2 ISAA Report with these located in Scotland, Wales, England, Northern Ireland and the Republic of Ireland. These comprised three marine SPAs (Irish Sea Front SPA, North-west Irish Sea SPA and Seas off St Kilda SPA), 32 breeding seabird colony SPAs and three Ramsar sites:

- Morecambe Bay and Duddon Estuary SPA (and Ramsar site)
- Ribble and Alt Estuaries SPA (and Ramsar site)
- Irish Sea Front SPA
- Bowland Fells SPA
- North-west Irish Sea SPA
- Copeland Islands SPA
- Glannau Aberdaron ac Ynys Enlli/ Aberdaron Coast and Bardsey Island SPA
- Lambay Island SPA
- Ireland’s Eye SPA
- Howth Head Coast SPA
- Ailsa Craig SPA
- Wicklow Head SPA
- Rathlin Island SPA
- Forth Islands SPA
- Flamborough and Filey Coast SPA
- Skomer, Skokholm and the Seas off Pembrokeshire SPA
- North Colonsay and Western Cliffs SPA
- Grassholm SPA

- Saltee Islands SPA
- Rum SPA
- Mingulay and Berneray SPA
- Buchan Ness to Collieston Coast SPA
- Troup, Pennan and Lion's Heads SPA
- The Shiant Isles SPA
- East Caithness Cliffs SPA
- Isles of Scilly SPA (and Ramsar site)
- Seas off St Kilda SPA
- Handa SPA
- St Kilda SPA
- Cape Wrath SPA
- Flannan Isles SPA
- Sule Skerry and Sule Stack SPA
- North Rona and Sula Sgeir SPA
- West Westray SPA
- Hermaness, Saxa Vord and Valla Field SPA.

1.3.3 Screening outcomes for the Morgan Generation Assets in-combination

1.3.3.1 All offshore ornithology sites which could not be excluded from the alone assessment are also included within the in-combination assessment following LSE screening. Further information on in-combination assessment methodology is presented within section 1.4.7.

1.3.4 Summary table of HRA Stage 1 Screening Report outcomes

1.3.4.1 Table 1.2 presents a summary of the 35 SPAs (and 3 Ramsar sites) and relevant qualifying features for which LSE could not be ruled out and therefore an Appropriate Assessment is required to be undertaken. The distances presented within Table 1.2 were calculated as a straight line between the relevant SPA and Ramsar site and the Morgan Generation Assets boundary.

Table 1.2: A summary of all European sites for which the potential for LSE could not be discounted in E1.4 HRA Phase 1 Screening Report (Document Reference E1.4), and for which Appropriate Assessment is required.

European site	Distance to Morgan Generation Assets (km)	Relevant qualifying features	Project phase	Potential impact
Morecambe Bay and Duddon Estuary SPA/Morecambe Bay Ramsar	31.1	Lesser black-backed gull *Larus fuscus* Herring gull *Larus argentatus* Breeding seabird assemblage	Operations and maintenance	• Collision risk • In-combination effects.
Ribble and Alt Estuaries SPA/ Ribble and Alt Estuaries Ramsar	51.0	Lesser black-backed gull *Larus fuscus* Breeding seabird assemblage	Operations and maintenance	• Collision risk • In-combination effects.
Irish Sea Front SPA	56.7	Manx shearwater *Puffinus puffinus*	Operations and maintenance	• Disturbance and displacement from airborne sound and presence of vessels and infrastructure • In-combination effects.
Bowland Fells SPA	70.0	Lesser black-backed gull *Larus fuscus*	Operations and maintenance	• Collision risk • In-combination effects.
North-west Irish Sea SPA	88.2	Kittiwake *Rissa tridactyla*	Operations and maintenance	• Disturbance and displacement from airborne sound and presence of vessels and infrastructure • Collision risk • In-combination effects.
		Herring gull *Larus argentatus* (non-breeding season)	Operations and maintenance	• Collision risk • In-combination effects.

European site	Distance to Morgan Generation Assets (km)	Relevant qualifying features	Project phase	Potential impact
		Guillemot *Uria aalge* (non-breeding season) Razorbill *Alca torda* (non-breeding season)	Operations and maintenance	• Disturbance and displacement from airborne sound and presence of vessels and infrastructure • In-combination effects.
Copeland Islands SPA	112.3	Manx shearwater *Puffinus puffinus*	Operations and maintenance	• Disturbance and displacement from airborne sound and presence of vessels and infrastructure • In-combination effects.
Glannau Aberdaron ac Ynys Enlli/Aberdaron Coast and Bardsey Island SPA	128.7	Manx shearwater *Puffinus puffinus*	Operations and maintenance	• Disturbance and displacement from airborne sound and presence of vessels and infrastructure • In-combination effects.
Lambay Island SPA	130.4	Kittiwake *Rissa tridactyla* Breeding seabird assemblage	Operations and maintenance	• Disturbance and displacement from airborne sound and presence of vessels and infrastructure • Collision risk • In-combination effects.
		Herring gull *Larus argentatus* (non-breeding season)	Operations and maintenance	• Collision risk • In-combination effects.

European site	Distance to Morgan Generation Assets (km)	Relevant qualifying features	Project phase	Potential impact
		Guillemot *Uria aalge* (non-breeding season) Razorbill *Alca torda* (non-breeding season)	Operations and maintenance	• Disturbance and displacement from airborne sound and presence of vessels and infrastructure • In-combination effects.
Ireland's Eye SPA	138.6	Kittiwake *Rissa tridactyla*	Operations and maintenance	• Disturbance and displacement from airborne sound and presence of vessels and infrastructure • Collision risk • In-combination effects.
Howth Head Coast SPA	139.3	Kittiwake *Rissa tridactyla*	Operations and maintenance	• Disturbance and displacement from airborne sound and presence of vessels and infrastructure • Collision risk • In-combination effects.
Ailsa Craig SPA	142.3	Gannet *Morus bassanus* Kittiwake *Rissa tridactyla* Breeding seabird assemblage	Operations and maintenance	• Disturbance and displacement from airborne sound and presence of vessels and infrastructure • Collision risk • In-combination effects.
Wicklow Head SPA	165.4	Kittiwake *Rissa tridactyla*	Operations and maintenance	• Disturbance and displacement from airborne sound and presence of vessels and infrastructure • Collision risk • In-combination effects.

European site	Distance to Morgan Generation Assets (km)	Relevant qualifying features	Project phase	Potential impact
Rathlin Island SPA	186.1	Kittiwake *Rissa tridactyla* Breeding seabird assemblage	Operations and maintenance	• Disturbance and displacement from airborne sound and presence of vessels and infrastructure • Collision risk • In-combination effects.
		Guillemot *Uria aalge* (non-breeding season) Razorbill *Alca torda* (non-breeding season)	Operations and maintenance	• Disturbance and displacement from airborne sound and presence of vessels and infrastructure • In-combination effects.
Forth Islands SPA	219.9	Gannet *Morus bassanus* (non-breeding seasons) Breeding seabird assemblage	Operations and maintenance	• Disturbance and displacement from airborne sound and presence of vessels and infrastructure • Collision risk • In-combination effects.
Flamborough and Filey Coast SPA	233.5	Kittiwake *Rissa tridactyla* (non-breeding seasons) Breeding seabird assemblage	Operations and maintenance	• Disturbance and displacement from airborne sound and presence of vessels and infrastructure • Collision risk • In-combination effects.
Skomer, Skokholm and the Seas off Pembrokeshire SPA	252.0	Kittiwake *Rissa tridactyla* (non-breeding seasons) Breeding seabird assemblage	Operations and maintenance	• Disturbance and displacement from airborne sound and presence of vessels and infrastructure • Collision risk • In-combination effects.

European site	Distance to Morgan Generation Assets (km)	Relevant qualifying features	Project phase	Potential impact
		Lesser black-backed gull *Larus fuscus*	Operations and maintenance	• Collision risk • In-combination effects.
		Manx shearwater *Puffinus puffinus* Guillemot (non-breeding season only) Razorbill *Alca torda* (non-breeding seasons)	Operations and maintenance	• Disturbance and displacement from airborne sound and presence of vessels and infrastructure • In-combination effects.
North Colonsay and Western Cliffs SPA	257.6	Kittiwake *Rissa tridactyla* Breeding seabird assemblage	Operations and maintenance	• Disturbance and displacement from airborne sound and presence of vessels and infrastructure • Collision risk • In-combination effects.
		Guillemot *Uria aalge* (non-breeding seasons	Operations and maintenance	• Disturbance and displacement from airborne sound and presence of vessels and infrastructure • In-combination effects.
Grassholm SPA	260.3	Gannet *Morus bassanus*	Operations and maintenance	• Disturbance and displacement from airborne sound and presence of vessels and infrastructure • Collision risk • In-combination effects.
Saltee Islands SPA	265.9	Gannet *Morus bassanus* Kittiwake *Rissa tridactyla* Breeding seabird assemblage	Operations and maintenance	• Disturbance and displacement from airborne sound and presence of vessels and infrastructure • Collision risk

European site	Distance to Morgan Generation Assets (km)	Relevant qualifying features	Project phase	Potential impact
				• In-combination effects.
		Guillemot (non-breeding season only) Razorbill *Alca torda* (non-breeding seasons)	Operations and maintenance	• Disturbance and displacement from airborne sound and presence of vessels and infrastructure • In-combination effects.
Rum SPA	340.7	Manx shearwater Breeding seabird assemblage	Operations and maintenance	• Disturbance and displacement from airborne sound and presence of vessels and infrastructure • In-combination effects.
Mingulay and Berneray SPA	370.3	Guillemot *Uria aalge* (non-breeding seasons) Razorbill *Alca torda* (non-breeding season) Breeding seabird assemblage	Operations and maintenance	• Disturbance and displacement from airborne sound and presence of vessels and infrastructure • In-combination effects.
Buchan Ness to Collieston Coast SPA	385.7	Kittiwake *Rissa tridactyla* (non-breeding seasons) Breeding seabird assemblage	Operations and maintenance	• Disturbance and displacement from airborne sound and presence of vessels and infrastructure • Collision risk • In-combination effects.
Troup, Pennan and Lion's Heads SPA	414.7	Kittiwake *Rissa tridactyla* (non-breeding seasons) Breeding seabird assemblage	Operations and maintenance	• Disturbance and displacement from airborne sound and presence of vessels and infrastructure • Collision risk

European site	Distance to Morgan Generation Assets (km)	Relevant qualifying features	Project phase	Potential impact
				• In-combination effects.
The Shiant Isles SPA	442.5	Razorbill *Alca torda* (non-breeding season) Breeding seabird assemblage	Operations and maintenance	• Disturbance and displacement from airborne sound and presence of vessels and infrastructure • In-combination effects.
East Caithness Cliffs SPA	449.8	Kittiwake *Rissa tridactyla* (non-breeding seasons) Breeding seabird assemblage	Operations and maintenance	• Disturbance and displacement from airborne sound and presence of vessels and infrastructure • Collision risk • In-combination effects.
Isles of Scilly SPA/Isles of Scilly Ramsar	464.8	Lesser black-backed gull *Larus fuscus* (non-breeding season) Great black-backed gull *Larus marinus* (non-breeding season) (SPA feature only) Breeding seabird assemblage	Operations and maintenance	• Collision risk • In-combination effects.
		Manx shearwater *Puffinus puffinus* (SPA feature only) Breeding seabird assemblage	Operations and maintenance	• Disturbance and displacement from airborne sound and presence of vessels and infrastructure • In-combination effects.

European site	Distance to Morgan Generation Assets (km)	Relevant qualifying features	Project phase	Potential impact
Seas off St Kilda SPA	474.3	Guillemot *Uria aalge* (non-breeding seasons) Fulmar *Fulmarus glacialis*	Operations and maintenance	• Disturbance and displacement from airborne sound and presence of vessels and infrastructure • In-combination effects.
		Gannet *Morus bassanus*	Operations and maintenance	• Disturbance and displacement from airborne sound and presence of vessels and infrastructure • Collision risk • In-combination effects.
Handa SPA	480.2	Guillemot *Uria aalge* (non-breeding seasons) Razorbill *Alca torda* (non-breeding season) Breeding seabird assemblage	Operations and maintenance	• Disturbance and displacement from airborne sound and presence of vessels and infrastructure • In-combination effects.
St Kilda SPA	490.4	Gannet *Morus bassanus* (non-breeding season) Breeding seabird assemblage	Operations and maintenance	• Disturbance and displacement from airborne sound and presence of vessels and infrastructure • Collision risk • In-combination effects
		Guillemot *Uria aalge* (non-breeding seasons) Fulmar *Fulmarus glacialis* Manx shearwater *Puffinus puffinus*	Operations and maintenance	• Disturbance and displacement from airborne sound and presence of vessels and infrastructure • In-combination effects.
Cape Wrath SPA	502.3	Kittiwake *Rissa tridactyla* (non-breeding seasons) Breeding seabird assemblage	Operations and maintenance	• Disturbance and displacement from airborne

European site	Distance to Morgan Generation Assets (km)	Relevant qualifying features	Project phase	Potential impact
				sound and presence of vessels and infrastructure • Collision risk • In-combination effects.
		Guillemot *Uria aalge* (non-breeding seasons)	Operations and maintenance	• Disturbance and displacement from airborne sound and presence of vessels and infrastructure • In-combination effects.
Flannan Isles SPA	510.8	Guillemot *Uria aalge* (non-breeding seasons) Breeding seabird assemblage	Operations and maintenance	• Disturbance and displacement from airborne sound and presence of vessels and infrastructure • In-combination effects.
Sule Skerry and Sule Stack SPA	548.9	Gannet *Morus bassanus* (non-breeding seasons Breeding seabird assemblage	Operations and maintenance	• Disturbance and displacement from airborne sound and presence of vessels and infrastructure • Collision risk • In-combination effects.
		Guillemot *Uria aalge* (non-breeding seasons)	Operations and maintenance	• Disturbance and displacement from airborne sound and presence of vessels and infrastructure • In-combination effects.
North Rona and Sula Sgeir SPA	567.8	Gannet *Morus bassanus* (non-breeding seasons) Breeding seabird assemblage	Operations and maintenance	• Disturbance and displacement from airborne sound and presence of vessels and infrastructure • Collision risk

European site	Distance to Morgan Generation Assets (km)	Relevant qualifying features	Project phase	Potential impact
				• In-combination effects.
West Westray SPA	580.3	Kittiwake *Rissa tridactyla* (non-breeding seasons) Breeding seabird assemblage	Operations and maintenance	• Disturbance and displacement from airborne sound and presence of vessels and infrastructure • Collision risk • In-combination effects.
Hermaness, Saxa Vord and Valla Field SPA	763.5	Gannet *Morus bassanus* (non-breeding seasons) Breeding seabird assemblage	Operations and maintenance	• Disturbance and displacement from airborne sound and presence of vessels and infrastructure • Collision risk • In-combination effects.

1.4 Information to support the Appropriate Assessment

1.4.1 Overview

1.4.1.1 As described in the HRA Stage 2 ISAA Part 1 – Introduction (Document Reference E1.1), a European site is progressed to the Appropriate Assessment stage (Stage Two of the HRA process) where it is not possible to exclude an LSE on one or more of its qualifying interest features in view of the site's conservation objectives. European sites, features and potential impacts requiring an Appropriate Assessment for the Morgan Generation Assets are therefore those for which LSE could not be ruled out during the Screening exercise and following consultation (see Table 1.1).

1.4.1.2 Information to help inform the Appropriate Assessment for SPAs (and Ramsar sites) is provided in the following sections of this Part of the HRA Stage 2 ISAA Report. The information provided includes a description of the SPAs (and Ramsar sites) under consideration, their qualifying interest features, and an assessment of potential effects on site integrity in light of the conservation objectives of each site.

1.4.2 Maximum design scenarios

1.4.2.1 For all SPAs (and Ramsar sites) considered in this Part of the HRA Stage 2 ISAA Report, the assessments have been based on a realistic Maximum Design Scenario (MDS). Each MDS has been derived from the design envelope for the Morgan Generation Assets. Volume 1, Chapter 3: Project description of the Environmental Statement (Document Reference F1.3) describes the design of the Morgan Generation Assets and identifies the range of potential parameters for all relevant components.

1.4.2.2 The MDS for each of the potential impacts for ornithological features are tabulated separately in this HRA Stage 2 ISAA Report according to the effect-pathway under consideration. The assessment scenarios are consistent with those used for assessment in Volume 2, Chapter 5: Offshore ornithology of the Environmental Statement (Document Reference F2.5).

1.4.3 Measures adopted as part of the Morgan Generation Assets

1.4.3.1 An iterative approach to the Morgan Generation Assets Environmental Impact Assessment (EIA) and HRA process has been utilised to inform the Morgan Generation Assets design (through the identification of likely significant effects and development of measures to address these), this is explained in more detail in Volume 1, Chapter 5: Environmental Impact Assessment methodology of the Environmental Statement. The incorporation of such measures within the design of the Morgan Generation Assets demonstrates commitment to implementing the identified measures.

1.4.3.2 The term 'measures adopted as part of the Morgan Generation Assets' is used in this HRA Stage 2 ISAA Report to include the following measures (adapted from IEMA, 2016):

- Measures included as part of the project design. These include modifications to the location or design envelope of the Morgan Generation Assets which are integrated into the application for consent. These measures are secured through the consent itself through the description of the development and the parameters secured in the Development Consent Order (DCO) (Document Reference C1) and/or marine licences (referred to as primary mitigation in IEMA, 2016)

- Measures required to meet legislative requirements, or actions that are generally standard practice used to manage commonly occurring environmental effects and are secured through the DCO requirements and/or the conditions of the marine licences (referred to as tertiary mitigation in IEMA, 2016).

1.4.3.3 The relevant measures adopted as part of the Mogan Generation Assets for each of the potential impacts for ornithological features are tabulated separately in this HRA Stage 2 ISAA Report according to the effect-pathway under consideration.

1.4.4 Baseline information

1.4.4.1 Baseline information on the European sites identified for further assessment within the HRA Stage 2 ISAA Report has been gathered through a comprehensive desktop study of existing studies and datasets. The key data sources used in section 1.4.7 are summarised below. Any additional sources of information used in this Part of the HRA Stage 2 ISAA Report are also summarised.

1.4.4.2 For offshore ornithology SPA and Ramsar sites, the main source of baseline information comes from the 24 month site-specific aerial survey data and baseline characterisation for ornithology. The detailed methods, results and analysis of the aerial surveys are presented within documentation associated with the Environmental Statement:

- Volume 4, Annex 5.1: Offshore ornithology baseline characterisation report of the Environmental Statement
- Volume 4, Annex 5.2: Offshore ornithology displacement technical report of the Environmental Statement
- Volume 4, Annex 5.3: Offshore ornithology collision risk modelling Technical Report of the Environmental Statement
- Volume 4, Annex 5.4: Offshore ornithology migratory bird collision risk modelling technical report of the Environmental Statement
- Volume 4, Annex 5.5: Offshore ornithology apportioning technical report of the Environmental Statement.

1.4.4.3 In addition to the baseline surveys, information was presented from multiple reports which investigated the ornithological assemblage of Liverpool Bay and the Irish Sea (Lawson *et al*., 2016; Waggitt *et al*., 2020; HiDef Aerial Surveying Limited, 2023; Bradbury *et al.,* 2014).

1.4.4.4 The site descriptions, conservation objectives and condition assessment (if relevant) of any site which was identified for further assessment (integrity test: Step 2) within this Part of the HRA Stage 2 ISAA are also presented within the baseline section (section 1.6.2).

1.4.5 Conservation objectives and advice

1.4.5.1 The SNCBs have produced conservation advice for European sites under their statutory remit. This conservation advice provides supplementary information on sites and features, and although the content provided is similar, the format of the advice provided varies between the different SNCBs.

1.4.5.2 Conservation objectives set the framework for establishing appropriate conservation measures for each feature of the site and provide a benchmark against which plans or projects can be assessed. The conservation objectives set out the essential elements

needed to ensure that a qualifying habitat or species is maintained or restored at a site. If all the conservation objectives are met, then the integrity of the site will be maintained, and deterioration or significant disturbance of the qualifying features avoided.

1.4.5.3 In this HRA Stage 2 ISAA Report, the Applicant has referenced the most up-to-date conservation objectives and conservation advice available. It is recognised that in the conservation advice documents, if any feature of the SPA is in unfavourable condition, the integrity of the site is deemed to be compromised and the overarching objective is therefore to restore site integrity.

1.4.5.4 Due to the location and scale of the Morgan Generation Assets, European sites with the potential to be impacted fall variously under the remit of Natural England, NRW, NatureScot, Department for Agriculture, Environment and Rural Affairs (DAERA), National Parks and Wildlife Service (NPWS) and the JNCC.

1.4.5.5 Natural England has published a 'European Site Conservation Objectives: Supplementary advice on conserving and restoring features' document. The document presents attributes which are ecological characteristics of the designated species and habitats within a site. Each attribute has a target which is either quantitative or qualitative depending on the available evidence. Targets are also listed for the desired state to be achieved for the attribute. For Welsh sites conservation advice has been developed by NRW in the form of a 'Regulation 37 Document'.

1.4.5.6 For some European sites under the statutory remit of NatureScot, NRW and/or Natural England, a Conservation Advice Package (CAP) document has been produced. Of the SPAs screened into this HRA Stage 2 ISAA Report, a CAP document has been produced for the following sites:

- Morecambe Bay and Duddon Estuary SPA
- Ribble and Alt Estuaries SPA
- Isles of Scilly SPA
- Flamborough and Filey Coast SPA.

1.4.5.7 CAP documents for other European sites have not yet been produced. These documents contain revised and updated conservation objectives for the features of each site, site-specific clarifications and advice in order for the conservation objectives to be achieved, and advice on management required to achieve the conservation objectives.

1.4.5.8 For European sites located within the Republic of Ireland, there are currently no CAP documents. However, conservation objectives have been published for all sites and these have been considered within this HRA Stage 2 ISAA Report.

1.4.5.9 For European sites which fall within both Welsh and English or English and Scottish territorial waters the two relevant governing SNCBs can publish separate conservation objectives for the same European site. Where this is the case for European sites assessed within this HRA Stage 2 ISAA Report, the most recently published conservation objectives have been used.

1.4.5.10 Where Ramsar site's interests coincide with qualifying features within an SPA, the advice for overlapping designations is considered to be, in most cases, sufficient to support the management of the Ramsar interests.

1.4.6 Approach to the in-combination assessments

1.4.6.1 The Habitats Regulations require the consideration of the potential effects of a project on European sites both alone and in-combination with other plans or projects.

1.4.6.2 When undertaking an in-combination assessment projects, plans or activities with which the Morgan Generation Assets may interact to produce an in-combination effect must be identified. These interactions may arise within the construction, operations and maintenance or decommissioning phases.

1.4.6.3 The process of identifying those projects, plans or activities for which there is the potential for an interaction to occur is referred to as 'screening'. A specialised process has been developed to methodically and transparently screen the large number of projects, plans and activities that may be considered cumulatively alongside the Morgan Generation Assets. This involves a staged process that considers the level of detail available for projects, plans and activities, as well as the potential for interactions on a conceptual, physical and temporal basis.

1.4.6.4 The projects, plans and activities screened into the in-combination assessment have been consulted upon with the SNCBs through this HRA Stage 2 ISAA, in order to seek agreement on the projects, plans and activities to be considered in the cumulative assessment.

1.4.6.5 The in-combination assessment has taken into account the potential impact associated with the Morgan Generation Assets together with the Transmission Assets, the Morecambe Offshore Windfarm Generation Assets and other projects and plans. The projects and plans selected as relevant to the in-combination assessment are presented in this HRA Stage 2 ISAA – Part 3 Special Protection Area (SPA) and Ramsar Site assessments, based on the results of the screening exercises for ornithology (as presented in Volume 2, Chapter 5: Offshore ornithology (Document Reference F2.5) of the Environmental Statement). Each project has been considered on a case-by-case basis for screening in or out of the assessment based upon data confidence, effect-receptor-pathways and the spatial/temporal scales involved.

1.4.6.6 The in-combination effects assessment is presented in a series of tables (one for each potential in-combination impact) which assess the following three Scenarios:

- Scenario 1: Morgan Generation Assets together with the Transmission Assets
- Scenario 2: Morgan Generation Assets together with the Transmission Assets and Morecambe Generation Assets
- Scenario 3: Morgan Generation Assets together with Morgan Transmission Assets, alongside all other projects, plans and activities. This assessment has been allocated into 'tiers' reflecting the current stage of the other projects plans and activities within the planning and development process. This tiered approach is adopted to provide a clear assessment of the Morgan Generation Assets and the Transmission Assets, alongside other projects plans and activities.

1.4.6.7 This approach provides a framework for placing relative weight on the potential for each project/plan to be included in the in-combination assessment to ultimately be realised, based upon the project/plan's current stage of maturity and certainty in the project's parameters. The allocation of each project, plan and activity into tiers is not affected by the screening process but is merely a categorisation applied to all projects, plans and activities that have been screened in for assessment. The tiered approach uses the following categorisations:

- Tier 1

  - 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 on-going impact
- Tier 2
  - Scoping report has been submitted and is in the public domain
- Tier 3
  - Scoping report has not been submitted and is not in the public domain
  - Identified in a relevant development plan
  - Identified in other plans and programmes.

1.4.6.8 An overview of the projects or activities considered for each receptor group are tabulated separately in each of the receptor chapters according to the effect-pathway under consideration.

1.4.6.9 As part of the in-combination assessment all projects for which collision risk estimates or population estimates are available are considered. This approach is consistent with the approach taken for previous offshore wind farm projects in UK waters. In some cases, SPAs and Ramsar sites for which LSE has been identified in relation to potential impacts associated with the Morgan Generation Assets may not have been given detailed consideration in the assessments produced previously for other projects considered in-combination. This often means that apportioning values in the breeding season for some SPAs (and Ramsar sites) are not provided in project-specific documentation for older projects. Where this occurs, available breeding season apportioning values from the nearest project for which a value is available have been applied. Where this approach has been followed, it has been identified above relevant tables in sections 1.5 and 1.6.

1.4.6.10 In the non-breeding seasons, although apportioning values may not have been calculated for SPAs in project-specific documentation for projects considered in-combination, apportioning values for these seasons are readily calculated from Furness (2015) and, generally the same as those used for the Morgan Generation Assets.

1.4.6.11 Differing levels of detail are available from projects in-combination depending on the species and SPA of interest. As part of the S42 consultation the SNCBs did not agree with the presentation of ‘unknown’ for projects which did not provide an apportioned, or total impact. Natural England provided an advice note following EWG 5 to provide a way to present older projects data which included calculating impact estimates for projects for which project-specific estimates were not available. The Morgan Generation Assets has followed the approach undertaken by all previous projects in UK waters and has not calculated in-combination collision risk estimates for projects for which project-specific values are not available. Although the lack of estimates introduces uncertainty into in-combination assessments, calculating estimates for a project also leads to the introduction of uncertainty and no further certainty that the resulting in-combination assessments are any more accurate due to the various factors and assumptions required for collision risk modelling. The assessments conducted present as much information as possible for all projects providing qualitative discussion on projects for which quantified estimates are not available.

1.4.6.12 Where information is available for a project, collision risk estimates have been updated using the avoidance rate recommended by the EWG for the relevant species to provide a precautionary approach that ensures sites are not omitted from the assessment prematurely. Assumptions in relation to in-combination displacement impacts are provided for each relevant SPA in section 1.5.3.

1.4.6.13 Where a project is progressed to the integrity test: Step 2 (section 1.61.4.7), further information is provided on the likely impact associated with projects for which impact estimates are not available. Where consideration of in-combination impacts is required in the integrity test: Step 1, consideration has been given as to whether the inclusion of projects for which quantified impact estimates are unavailable would alter the conclusions reached.

1.4.7 Updated HRA methodology for offshore ornithological features

1.4.7.1 The approach undertaken for ornithology Stage 1 HRA Screening in the PEIR, set out the Applicant's aim to develop a proportionate HRA, whilst making the assessment more accessible for stakeholders. However, the feedback from stakeholders in the offshore ornithology EWG and formally via the Section 42 responses was that this methodology is not what has been applied to other wind farms historically. The Applicant therefore proposed an updated methodology for the Stage 1 HRA Screening Report (Document Reference E1.4) and Stage 2 ISAA to be submitted with the application for development consent, in the form of a technical note which was issued to stakeholders as part of the EWG process. The technical note is appended to the Technical Engagement Plan (Document Reference E4) alongside the EWG discussion on the document.

1.4.7.2 As part of the EWG process, stakeholders agreed with the following two-step approach to the HRA Stage 2 ISAA for offshore ornithological features outlined below (see Technical Engagement Plan (Document Reference E4)).

1.4.7.3 Step 1 involves a high level initial assessment focusing on the apportioning assessment (Volume 4, Annex 5.5: Offshore Ornithology Apportioning Technical Report of the Environmental Statement) to present where there is low risk of an adverse effect on the integrity of an SPA or Ramsar site. Some sites will not be considered further if the defined criteria are met, whereas other sites where an adverse effect on site integrity cannot be ruled out, are taken forward to the integrity test: Step 2. Figure 1.1provides a diagram of the two-step approach to the HRA Stage 2 ISAA for offshore ornithological features.

1.4.7.4 Within integrity test: Step 2 a more detailed assessment has been undertaken on the SPAs (and Ramsar sites) where there is a risk of an adverse effect on the integrity.

1.4.7.5 Step 2 uses further detailed information from collision risk modelling (Volume 4, Annex 5.3: Offshore Ornithology Collision Risk Modelling Technical Report of the Environmental Statement) and displacement analyses (Volume 4, Annex 5.2: Offshore ornithology displacement technical report of the Environmental Statement) to examine the potential impacts against each conservation objective for the relevant SPAs to make a conclusion with regard to adverse effects on integrity.

1.4.7.6 Throughout all tables in this report, numbers are presented to an appropriate number of decimal places. Underlying calculations are conducted utilising the full number and therefore totals provided in tables may not equal the constituent numbers within the same table.

1.4.7.7 As shown within Table 1.2 the SPAs and Ramsar sites screened into this part of the HRA Stage 2 ISAA have relevant qualifying features which can be impacted during the

breeding and non-breeding season (i.e. the Morgan Generation Assets could potentially impact the species year round). However, some SPAs and Ramsar sites only have the potential to be impacted during the non-breeding season. Criteria for screening in or out a non-breeding season site is presented in the HRA LSE Screening Report (Document Reference E1.4). Figure 1.1 provides a diagram of the two-step approach to the HRA Stage 2 ISAA for offshore ornithological features.

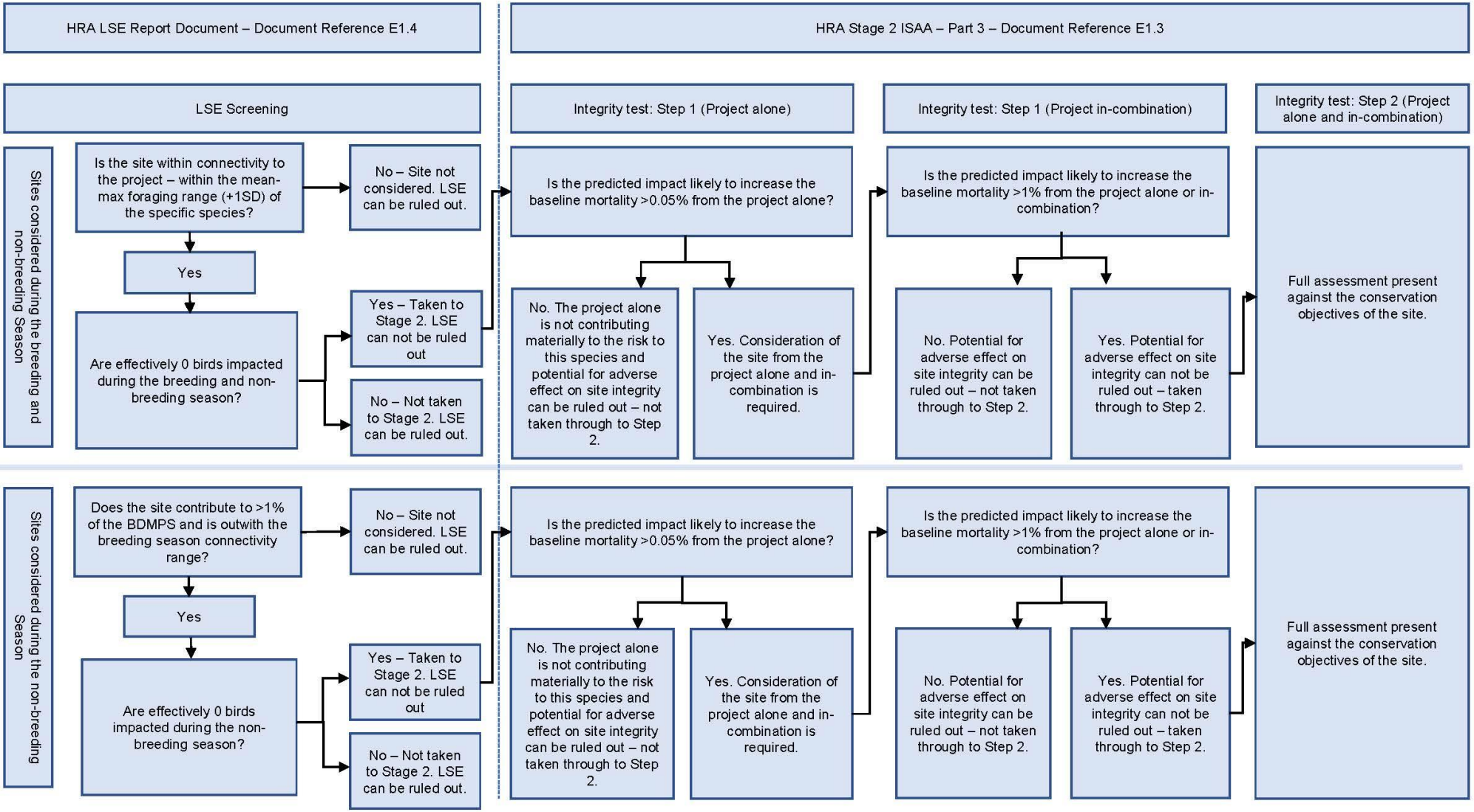

Figure 1.1: Flow diagram of the approach to the HRA for offshore ornithological features.

Integrity test: Step 1

1.4.7.8 Where the potential impact of the Morgan Generation Assets alone represents less than a 0.05% increase in baseline mortality of the relevant SPA population, then consideration is not given to the potential impact of the Morgan Generation Assets in-combination with other plans and projects. In these instances it is considered that the Morgan Generation Assets will not contribute to the existing in-combination impact as the impact predicted for the Morgan Generation Assets is not measurable and is within the limits of natural variation. If the Morgan Generation Assets alone contributed to an increase in baseline mortality of more than 0.05% in-combination impacts were also considered within the integrity test: Step 1.

1.4.7.9 For sites for which LSE was concluded in relation to potential impacts during the breeding and/or non-breeding seasons, if the predicted impact associated with the Morgan Generation Assets alone and in-combination represents less than a 1% increase in the baseline mortality of the designated population for a qualifying feature, then a high level assessment has been presented and a conclusion of no AEOI has been concluded.

1.4.7.10 If the predicted impact magnitude is more than a 1% increase in the baseline mortality for either the Morgan Generation Assets alone or the Morgan Generation Assets in-combination with other projects, an AEOI cannot be ruled out and the SPA (and/or Ramsar) and associated qualifying features have been progressed to the Integrity test: Step 2.

1.4.7.11 The impacts used in this step reflect the range of impacts predicted in Volume 4, Annex 5.2: Offshore ornithology displacement technical report of the Environmental Statement and Volume 4, Annex 5.3: Offshore Ornithology Collision Risk Modelling Technical Report of the Environmental Statement. If any part of the impact range breaches the baseline mortality thresholds defined above then the qualifying feature is progressed to the next stage of the process (i.e. consideration of in-combination impacts or the integrity test: Step 2).

1.5 Assessment of potential Adverse Effect on Integrity: Step 1

1.5.1 Sites considered within the assessment of potential Adverse Effect on Integrity: Step 1

1.5.1.1 The HRA Stage 1 Screening Report (Document Reference E1.4) identified the potential for LSEs on 35 SPAs and three Ramsar sites designated for offshore ornithological features (Table 1.3 and Figure 1.2). All features are considered throughout the annual cycle, unless otherwise specified in Table 1.3.

Table 1.3: European sites and relevant offshore ornithological features for which the potential for LSE could not be ruled out and therefore considered in the HRA Stage 2 ISAA.

European site	Relevant qualifying features (brackets indicate where there is an impact pathway exists in the non-breeding season only)
Morecambe Bay and Duddon Estuary SPA/Morecambe Bay Ramsar site	Lesser black-backed gull Herring gull Breeding seabird assemblage
Ribble and Alt Estuaries SPA (and Ramsar site)	Lesser black-backed gull Breeding seabird assemblage
Irish Sea Front SPA	Manx shearwater
Bowland Fells SPA	Lesser black-backed gull
North-west Irish Sea SPA	Kittiwake Herring gull (non-breeding season only) Guillemot (non-breeding season only) Razorbill (non-breeding season only)
Copeland Islands SPA	Manx shearwater
Glannau Aberdaron ac Ynys Enlli/ Aberdaron Coast and Bardsey Island SPA	Manx shearwater
Lambay Island SPA	Kittiwake Herring gull (non-breeding season only) Guillemot (non-breeding season only) Razorbill (non-breeding season only) Breeding seabird assemblage
Ireland's Eye SPA	Kittiwake
Howth Head Coast SPA	Kittiwake
Ailsa Craig SPA	Gannet Kittiwake Breeding seabird assemblage
Wicklow Head SPA	Kittiwake

European site	Relevant qualifying features (brackets indicate where there is an impact pathway exists in the non-breeding season only)
Rathlin Island SPA	Kittiwake Guillemot (non-breeding season only) Razorbill (non-breeding season only) Breeding seabird assemblage
Forth Islands SPA	Gannet (non-breeding seasons only) Breeding seabird assemblage
Flamborough and Filey Coast SPA	Kittiwake (non-breeding seasons only) Breeding seabird assemblage
Skomer, Skokholm and the Seas off Pembrokeshire SPA	Kittiwake (non-breeding seasons only) Lesser black-backed gull Manx shearwater Guillemot (non-breeding season only) Razorbill (non-breeding seasons only) Breeding seabird assemblage
North Colonsay and Western Cliffs SPA	Kittiwake Guillemot Uria aalge *(non-breeding season)* Breeding seabird assemblage
Grassholm SPA	Gannet
Saltee Islands SPA	Gannet Kittiwake Guillemot (non-breeding season only) Razorbill (non-breeding seasons only) Breeding seabird assemblage
Rum SPA	Manx shearwater Breeding seabird assemblage
Mingulay and Berneray SPA	Guillemot (non-breeding season only) Razorbill (non-breeding season only) Breeding seabird assemblage
Buchan Ness to Collieston Coast SPA	Kittiwake (non-breeding seasons only) Breeding seabird assemblage
Troup, Pennan and Lion's Heads	Kittiwake (non-breeding seasons only) Breeding seabird assemblage
The Shiant Isles SPA	Razorbill (non-breeding seasons only) Breeding seabird assemblage
East Caithness Cliffs SPA	Kittiwake (non-breeding seasons only) Breeding seabird assemblage

European site	Relevant qualifying features (brackets indicate where there is an impact pathway exists in the non-breeding season only)
Isles of Scilly SPA/Isles of Scilly Ramsar site	Lesser black-backed gull (non-breeding seasons only) Great black-backed gull (non-breeding season only) Manx shearwater Breeding seabird assemblage
Seas off St Kilda SPA	Guillemot (non-breeding season only) Fulmar Gannet
Handa SPA	Guillemot (non-breeding season only) Razorbill (non-breeding seasons only) Breeding seabird assemblage
St Kilda SPA	Guillemot (non-breeding season only) Gannet (non-breeding seasons only) Fulmar Manx shearwater Breeding seabird assemblage
Cape Wrath SPA	Kittiwake (non-breeding seasons only) Guillemot (non-breeding season only) Breeding seabird assemblage
Flannan Isles SPA	Guillemot (non-breeding seasons only) Breeding seabird assemblage
Sule Skerry and Sule Stack SPA	Guillemot (non-breeding season only) Gannet (non-breeding seasons only) Breeding seabird assemblage
North Rona and Sula Sgeir SPA	Gannet (non-breeding seasons only) Breeding seabird assemblage
West Westray SPA	Kittiwake (non-breeding seasons only) Breeding seabird assemblage
Hermaness, Saxa Vord and Valla Field SPA	Gannet (non-breeding seasons only) Breeding seabird assemblage

Figure 1.2: Location of SPAs and Ramsar sites designated for offshore ornithological features for which an Appropriate Assessment is required.

1.5.2 Impacts considered within the assessment of potential Adverse Effect on Integrity: Step 1

1.5.2.1 The impacts considered within the HRA Stage 1 Screening Report (Document Reference E1.4) for which LSE could not be ruled out for the SPAs and/or Ramsar sites identified in Table 1.3 and are therefore assessed within integrity test: Step 1 are as follows:

- During the operations and maintenance phase
  - Disturbance and displacement from airborne sound and presence of vessels and infrastructure
  - Collison risk
  - In-combination effects.

1.5.2.2 The following sections provide a brief overview, the impact specific MDS and the mitigation measures proposed for each impact being considered within the Integrity test: Step 1.

Disturbance and displacement from airborne sound and presence of vessels and infrastructure

1.5.2.3 Airborne sound and the presence of vessels and infrastructure, during the operations and maintenance phase may disturb seabirds from offshore foraging or non-foraging areas (e.g. rafting, moulting). This disturbance and subsequent displacement may cause changes in behaviour and may lead to a reduction in foraging opportunities or increased energy expenditure, resulting in decreased survival rates or productivity in the population. Additional information on airborne sound associated with the Morgan Generation Assets is provided in the Airborne Construction Sound Technical Report of the Environmental Statement (Document Reference: F4.1.4.1).

1.5.2.4 The MDS considered within this assessment is shown in Table 1.4.

Table 1.4: MDS considered for the assessment of potential impacts on offshore ornithological features on SPAs and Ramsar sites designated for offshore ornithological features from disturbance and displacement from airborne sound, and presence of vessels and infrastructure during the operations and maintenance phase.

Project phase	Maximum design scenario	Justification
Operations and maintenance	• Presence of up to 96 operating wind turbines and up to four Offshore Substation Platforms (OSPs) occupying the Morgan Array Area of up to 280 km^2 • Minimum spacing of 1400 m between wind turbines • Up to 719 operations and maintenance vessel movements (return trips) each year • Up to a total of 16 operations and maintenance vessels on site at any one time	Represents the maximum density of wind turbines and structures across the maximum Morgan Array Area that would cause greatest extent of disturbance and displacement to birds or the greatest duration of impact. Represents the maximum underwater sound impacts from impact piling for each of the relevant infrastructure foundation options. Represents the maximum number of vessel and helicopter movements that would cause greatest visual and noise disturbance and displacement to birds from the Morgan Array Area.

Project phase	Maximum design scenario	Justification
	• Up to 639 helicopter return trips per year with up to seven on site at any one time • Up to 214 inspection drones return trips per year (operated from vessel, two inspections per wind turbine per year as a maximum) • Operational lifetime of up to 35 years.	

Collision risk

1.5.2.5 During the operations and maintenance phase of the Morgan Generation Assets, the turning rotor blades of the wind turbines may present a risk of collision for seabirds. When a collision occurs between the turning rotor blade and the bird, it is assumed to result in direct mortality of the bird, which potentially could result in population level impacts.

1.5.2.6 Stationary structures, such as the tower, nacelle or when rotors are not operating, are not expected to result in a material risk of collision.

1.5.2.7 The MDS considered within this assessment is shown in Table 1.5.

Table 1.5: MDS considered for the assessment of potential collision risk impacts on SPAs and Ramsar sites designated for offshore ornithological features

Project phase	Maximum design scenario	Justification
Operations and maintenance	Presence of up to 96 wind turbines within the Morgan Array Area Minimum lower blade tip height of 34 m above Lowest Astronomical Tide (LAT) Minimum hub height of 159 m above LAT Maximum blade tip height of 293 m above LAT Maximum rotor diameter of 250 m Maximum chord width of 6.8 m Average rotor speed of 6.2 Revolutions Per Minute (rpm) (with maximum speed of 8.4 rpm) Operational lifetime of up to 35 years.	The potential for collision risk is derived from wind turbines parameters including rotor diameter, chord width, rotor speed and minimum lower blade tip height. The parameters associated with the most numerous wind turbine parameters (no. 96) represents the MDS because it will result in the greatest potential for collision risk.

Measures adopted as part of the Morgan Generation Assets

1.5.2.8 Measures adopted as part of the Morgan Generation Assets which are of relevance to the assessment of potential impacts on ornithological features from collision risk are presented in Table 1.6.

Table 1.6: Measures adopted as part of the Morgan Generation Assets relevant to the assessment of adverse effect on SPAs and Ramsar sites designated for offshore ornithological features from collision risk.

Measures adopted as part of the Morgan Generation Assets	Justification	How the measure will be secured
Primary measures: Measures included as part of the project design		
The Applicant has committed to a minimum lower blade tip height (air draught) of 34 m above LAT.	Air draught is known to be an important factor for collision risk, with typically fewer collisions predicted with increasing air draught.	To be secured within the Draft DCO (Document Reference C1).
Tertiary measures: Measures required to meet legislative requirements, or adopted standard industry practice		
Offshore EMP that will include measures to minimise disturbance to rafting birds from transiting vessels.	The development of and adherence to an Offshore EMP which will include measures to minimise disturbance to rafting birds from transiting vessels.	To be secured through a condition in the deemed marine licences of the DCO.
The Offshore EMP will include a Marine Pollution Contingency Plan (MPCP).	Implementation of an EMP including a MPCP which will include planning for accidental spills, address all potential contaminant releases and include key emergency details.	To be secured through a condition in the deemed marine licences of the DCO.

1.5.3 Assessment of potential Adverse Effect on Integrity - Integrity test: Step 1

Overview

1.5.3.1 The Integrity test: Step 1 has utilised the impact magnitudes as predicted in the relevant technical reports (Volume 4, Annex 5.2: Offshore ornithology displacement technical report of the Environmental Statement and Volume 4, Annex 5.3: Offshore Ornithology Collision Risk Modelling Technical Report of the Environmental Statement) and then apportioned to each SPA using the apportioning values in Volume 4, Annex 5.5: Offshore Ornithology Apportioning Technical Report of the Environmental Statement. The breeding season apportioning values presented in the following tables incorporate both SPA proportions and adult: immature ratios as presented in Volume 4, Annex 5.5: Offshore Ornithology Apportioning Technical Report. The apportioning values do not include consideration of sabbatical birds.

1.5.3.2 Where the potential impact (either individual impacts or for certain species combined impacts) of the Morgan Generation Assets alone represents less than a 0.05% increase in the baseline mortality of the relevant populations, then consideration is not given to the impact of the Morgan Generation Assets in-combination with other plans and projects. In these instances, it is considered that the Morgan Generation Assets will not contribute to the existing in-combination impact as the impact predicted for the Morgan Generation Assets is not measurable and is within the limits of natural variation.

1.5.3.3 Conclusions for all breeding seabird assemblages are considered to be the same as for individual features and therefore if an individual feature is progressed to the integrity test: Step 2 then the associated breeding assemblage will also be considered.

1.5.3.4 The SPA populations used in Step 1 represent the most recent population for each feature with these primarily sourced from the Seabirds Count dataset (Burnell *et al.,* 2023) or where a more recent complete count is available from the Seabird Monitoring Programme (SMP) database (JNCC, 2023) or other relevant sources.

1.5.3.5 For potential in-combination impacts (disturbance and displacement from airborne noise, underwater sound, and presence of vessels and infrastructure during the operations and maintenance phase), the seasonal abundance values and seasonal collision values are presented in Volume 2, Chapter 5: Offshore Ornithology of the Environmental Statement (Document Reference F2.5). Apportioning values have been sourced from project-specific literature where available. If unavailable the apportioning value calculated for the nearest project has been applied. The assumptions in relation to apportioning are provided alongside relevant tables in the SPA-specific sections below.

Methodology for disturbance and displacement from airborne noise, underwater sound, and presence of vessels and infrastructure during the operations and maintenance phase impacts

Evidence-based displacement and mortality rates

1.5.3.6 Since displacement sensitivity varies between species, the displacement rates and associated mortality rates used to assess the effects of the operations and maintenance phase of the Morgan Generation Assets have been derived from previous studies, guidance documents and advice received by SNCBs during the Evidence Plan Process.

1.5.3.7 There is limited empirical evidence on which mortality rate to use when assessing the impacts of displacement of offshore wind farms, however, the current SNCBs guidance, based on expert opinion, is to consider a mortality rate of up to 10% (JNCC et al., 2022). Van Kooten *et al*. (2019) studied the effects of displacement on seabirds using energy-budget models for two scenarios using habitat utilization maps and a fixed 10% mortality rate. The evidence from this study suggests that a 1% mortality rate for displaced birds is more appropriate than the potentially over-precautionary 10% mortality rate. Similarly, Searle et al. (2014; 2018) used time and energy budget models to investigate the effects of displacement and barrier effects on breeding populations of seabirds, including auks during the chick rearing period. The study reported changes in time and energy budgets which could impact future survival of auks, however the simulations concluded that the displacement effects were unlikely to result in a mortality rate increase of over 0.5%. Therefore, in line with the advice from the JNCC *et al*. (2022), a 1 to 10% mortality of displaced individuals is presented for all species in this assessment, although the Applicant considers that 1% mortality rate to be the more likely impact for all species based on the studies discussed above.

Guillemot and razorbill

1.5.3.8 Evidence shows that auk species have a moderate vulnerability to displacement from structures (Wade *et al.,* 2016). Furthermore, displacement impacts from post-consent monitoring studies (from 13 different European offshore windfarm sites) have been collated and reviewed by Dierschke *et al.,* (2016), which found auk species to show ‘weak displacement’ overall, but results were highly variable. Similarly, a recent review submitted by Hornsea Four Offshore Wind Farm (APEM, 2022) summarises all current post consent-monitoring studies undertaken to date within the UK waters and provides an extensive study and analysis of the empirical data from offshore wind farms. This review found that auk displacement varies considerably across different sites, with

displacement rates ranging from +112% to -75%. However, this review concluded that a displacement rate of 50% and mortality rate of 1% was appropriate for use in relation to displacement assessments being undertaken for the Hornsea Four offshore wind farm. The review suggests that in areas of high abundance, displacement is limited and postulates that this may be due to higher importance of the underlying habitat to birds meaning birds are more likely to tolerate the presence of structures in the area. For areas with low abundance, displacement rates were increased and the review postulates that this may be that birds are able to forage in other areas as competition between birds is reduced. Although greater than 50% displacement was observed at five developments in the study, all had very low auk abundance of auks within the study area. Where auk abundance was greater, <50% displacement was recorded. Therefore, considering the abundance of auks within the Morgan Generation Assets plus a 2 km buffer, a 50% displacement rate is considered appropriate (and given the findings at Beatrice noted above) precautionary for the Morgan Generation Assets. The conclusions drawn in this review have however been questioned (Natural England, 2022d).

1.5.3.9 Monitoring of impacts at projects in the Irish Sea, indicate weak attraction/weak avoidance of auk species (APEM, 2022). The most recent study on displacement at the Beatrice offshore wind farm utilising an approach investigating the distribution of seabirds in relation to turbine locations suggested that auk species did not avoid turbines (MacArthur Green, 2023). The abundance of both guillemot and razorbill increased significantly from the pre-construction period into the post-construction period. This would suggest that these species are not displaced by offshore wind farms and that the use of a 50% displacement rate, as suggested by APEM (2022) is highly precautionary.

1.5.3.10 Based on the review of the relevant literature, a displacement rate of 50% during the operations and maintenance phase of the Morgan Generation Assets has been deemed appropriate for the auk species (i.e. guillemot and razorbill) considered in this assessment. This rate is considered to be highly precautionary as a study of offshore wind farms in the German North Sea found reduced displacement rates (~20%) of guillemots during the breeding season compared to the non-breeding season (Peschko *et al.,* 2020) and the most recent studies have shown no displacement of auks (MacArthur Green, 2023). This is an important consideration as the mean displacement rates derived from the Dierschke *et al*. (2016) review were primarily from data collected in the non-breeding season. Therefore, by applying a single displacement rate of 50% across all seasons ensures a precautionary rate is used for the assessment.

1.5.3.11 Furthermore, evidence suggests that although auk species are somewhat sensitive to displacement, the effects are short-term, and studies indicate auk habituation to offshore windfarms. For example, a study at Thanet Offshore Windfarm found auk species became habituated and the displacement rate of 75% to 85% in the first year of operations fell to 31% to 41% within years two and three of operations (Royal Haskoning, 2013). Further evidence is emerging through additional post-construction monitoring of offshore windfarms, for instance, there are reports of auk numbers increasing and observations of foraging behaviour within wind farm areas (Leopold and Verdaat, 2018). This suggests the displacement rates of auk species within the Morgan Generation Assets will reduce over time, and, given that the site is close to other offshore wind farms (such as Burbo Bank and West of Duddon Sands), some habituation may have already occurred within local populations that would result in reduced avoidance of the Morgan Generation Assets compared to a new offshore wind farm in a previously unimpacted region.

1.5.3.12 The conclusion from the literature review suggests that a displacement rate of 50% (range 30% to 70%) during the operations and maintenance phase of the Morgan Generation Assets and 2 km buffer is the most applicable for auk species, whilst still being suitably precautionary for assessment.

Manx shearwater

1.5.3.13 As there is limited evidence regarding displacement rates in Manx shearwater, it was advised by the SNCBs at the Offshore Ornithology EWG meeting (held 13 July 2023, see S42 Consultation, see Annex 5, Chapter 2: Offshore ornithology displacement technical report) that these are to be treated similarly to the auk species, using a 50% (range 30% to 70%) displacement rate. The use of a 50% displacement rate in Manx shearwater is also likely to be highly precautionary since this species shows weak avoidance to offshore wind farms and the population vulnerability to displacement is very low (Dierschke *et al.,* 2016; Wade *et al.,* 2016). If previous guidance (JNCC, 2022) were to be followed this would suggest a far lower displacement rate range of 0-10%.

Gannet

1.5.3.14 To assess the effects of the operations and maintenance phase of the Morgan Generation Assets on the gannet population in the area, a displacement rate of 70% (range 60% to 80%) and a mortality rate of 1% (range 1% to 10%) was used.

1.5.3.15 Evidence suggests that gannet show a limited vulnerability to disturbance from ship and helicopter traffic (Wade *et al.,* 2016), however, their avoidance rates to offshore wind farms can be high. Natural England recently reviewed nine studies that reported on gannet avoidance rates using a variation of survey methods (Pavat *et al.,* 2023). The avoidance rates reported range from 61.7% to 100%. Another review by APEM (2022) looked at studies across 25 offshore wind farms, over different seasons, and reported displacement rates of 40% to 60% during the breeding season, and 60% to 80% during the non-breeding season. In light of literature, and following guidance from Natural England (pers. comm., 7 July 2022), using a displacement rate of 70% has been deemed appropriate for this assessment.

1.5.3.16 Based on expert judgement a mortality rate of 1% (range 1% to 10%) was selected for this assessment. This decision is supported by additional evidence that suggests that gannet have a large mean-maximum (315 km) and maximum (709 km) foraging range (Woodward *et al.*, 2019) and feed on a diverse range of prey items and thus displaced birds will have access to suitable alternative foraging opportunities despite the potential reduced foraging activities within the Morgan Generation Assets.

Kittiwake

1.5.3.17 Kittiwake are considered to have a moderate habitat flexibility and low vulnerability to displacement (Wade *et al.,* 2016). However, following an agreement through the Evidence Plan Process and at the recommendation of JNCC, the species has been considered within the displacement assessment.

1.5.3.18 Studies regarding the displacement at Egmond aan Zee OWF (Leopold *et al.,* 2011), Bligh Bank OWF and Thorntonbank OWF (Vanermen, 2013). Horns Rev OWF, Princess Amalia Windpark (Furness, 2013) reported no significant displacement of kittiwake.

1.5.3.19 A study by Peschko (2020) used a long-term dataset covering 14 years before and 3 years after the construction of OWFs in the southern North Sea to assess the

displacement of kittiwake. They found a 45% decrease in density during the breeding season.

1.5.3.20 The EWG recommended the use of a 30-70% displacement rate range and a 1-10% mortality rate range. NatureScot advise a 30% displacement rate and 1% to 3% mortality rate for kittiwake in both the breeding and non-breeding season (Nature Scot, 2023) and when following joint SNCB guidance (JNCC *et al.,* 2022) a 10-30% displacement rate range would be used. In light of this guidance and additional evidence stated, for the purpose of this assessment, precautionary rates of 50% for displacement and 1% for mortality have been used for the operations and maintenance phase of the Morgan Generation Assets.

Fulmar

1.5.3.21 Fulmar is generally considered to have a very low vulnerability to disturbance and displacement impacts, often associating with vessels at sea (Wade *et al.,* 2016). Monitoring at several offshore wind farms has found no significant level of displacement for fulmar (Leopold *et al.,* 2013; Vanermen *et al.,* 2016; Vanermen *et al.,* 2019; Dierschke *et al.,* 2016). Densities of fulmars in such studies are often low, however, making the detection of any displacement effects challenging.

1.5.3.22 Joint SNCB guidance (JNCC et al., 2022) states that fulmar may not be displaced or hardly displaced and following the displacement vulnerability scores in Wade *et al.* (2016) would lead to the use of a 10% displacement rate. For the purpose of this assessment, precautionary rates of 0-10% for displacement and 1% for mortality have been used for the operations and maintenance phase of the Morgan Generation Assets.

Summary

1.5.3.23 Displacement impacts in the integrity test: Step 1 have been estimated using the displacement and mortality rates for each species presented in Table 1.7.

Table 1.7: Displacement and mortality rates used for assessment in integrity test: Step 1.

Species	Displacement rate (%)	Mortality rate (%)
Kittiwake	50	1
Guillemot	50	1
Razorbill	50	1
Fulmar	1 to 10	1
Manx shearwater	50	1
Gannet	70	1

1.5.3.24 The area in which the Morgan Generation Assets is located (i.e. the eastern Irish Sea) is not considered to be of importance for any of the species included in Table 1.7 (see Volume 4, Annex 5.1: Offshore Ornithology Baseline Characterisation Report of the Environmental Statement).

Methodology for collision risk impacts

1.5.3.25 Collision risk modelling has incorporated draft guidance on recommended avoidance rates, bird size, flight speed, flight type and nocturnal activity scores from Natural England (Natural England, pers. comm., 7 July 2022). Throughout the document, outputs have been presented alongside other parameter values (e.g. Oszanlav-Harris *et al.*, 2023; Skov *et al.,* 2018) to capture the uncertainty in various parameter values. In some instances, values for certain species (e.g. Manx shearwater) had not been provided within the Natural England guidance document. Parameters for these species therefore followed best available evidence (e.g. Gibb *et al.,* 2017; Wade *et al.,* 2016; Oszanlav-Harris *et al.,* 2023).

Morecambe Bay and Duddon Estuary SPA / Morecambe Bay Ramsar site

1.5.3.26 The Step 1 integrity test for the Morecambe Bay and Duddon Estuary SPA / Morecambe Bay Ramsar site is presented below for the Morgan Generation Assets alone (Table 1.8). The assessment considers the lesser black-backed gull and herring gull features of the SPA and Ramsar site in relation to potential collision risk impacts. The population at the SPA for both species was sourced from the SMP database for 2023 (JNCC, 2023).

Table 1.8: Step 1 integrity test for the Morecambe Bay and Duddon Estuary SPA / Morecambe Bay Ramsar site from the Morgan Generation Assets acting alone.

[a] Count is for the South Walney colony only but represents a larger population than recorded during the Seabirds Count and has therefore been used on a precautionary basis

Qualifying feature	Seasonal apportioning values				Total predicted impact (birds/annum)	SPA population (breeding adults)	% increase in baseline mortality	Conclusion
	Breeding	Post-breeding	Non-breeding	Pre-breeding				
Lesser black-backed gull	0.093	0.031	0.048	0.031	<0.1 to 0.1	1,724	0.01 to 0.03	No potential for AEOI
Herring gull	0.159	N/A	0.016	N/A	0.2 to 0.5	1,544[a]	0.07 to 0.18	No potential for AEOI from the Morgan Generation Assets alone

1.5.3.27 The predicted impact of the Morgan Generation Assets alone on the lesser black-backed gull feature of the Morecambe Bay and Duddon Estuary SPA / Morecambe Bay Ramsar site represents a 0.01% to 0.03% increase in baseline mortality of the SPA population. The predicted impact of the Morgan Generation Assets alone on the herring gull feature of the Morecambe Bay and Duddon Estuary SPA / Morecambe Bay Ramsar site represents a 0.07% to 0.18% increase in the baseline mortality of the SPA population. It should, however, be noted that, for both features, the impact magnitude is lower than 0.5 birds/annum, noting that there is considerable precaution in the assessment. There is therefore considered to be no adverse effect on the site integrity of the Morecambe Bay and Duddon Estuary SPA/Morecambe Bay Ramsar site as a result of potential impacts on lesser black-backed gull from the Morgan Generation Assets.

1.5.3.28 No in-combination assessment has been undertaken for lesser black-backed gull as the potential impact from the Morgan Generation Assets alone is predicted to be less than a 0.05% increase in baseline mortality. Therefore, it is considered that the Morgan Generation Assets will not make a measurable contribution to the existing in-combination impact. It can be concluded beyond reasonable scientific doubt that there is no risk of an AEOI of the Morecambe Bay and Duddon Estuary SPA /

Morecambe Bay Ramsar site as a result of collision risk with respect to operations and maintenance of the Morgan Generation Assets alone and in-combination with other plans and projects. The Morecambe Bay and Duddon Estuary SPA / Morecambe Bay Ramsar site have not been taken through to the integrity test: Step 2 and therefore potential impacts on the lesser black-backed gull feature of the Morecambe Bay and Duddon Estuary SPA / Morecambe Bay Ramsar have not been considered further.

1.5.3.29 As the potential impact for herring gull represents more than 0.05% of the baseline mortality of the SPA population, consideration is given to the existing in-combination impact (Table 1.9).

Table 1.9: Step 1 integrity test for the herring gull feature of the Morecambe Bay and Duddon Estuary SPA / Morecambe Bay Ramsar site from the Morgan Generation Assets acting in combination with other projects/plans in relation to collision risk.

Project	Seasonal apportioning values		Seasonal collision values	
	Breeding	Non-breeding	Breeding	Non-breeding
Awel y Môr	0.062	0.016	0.1	0.0
Burbo Bank Extension	0.060	0.016	1.0	0.2
Erebus	No connectivity	0.016	-	0.0
Mona Offshore Wind Project	0.110	0.016	0.0	0.0
Morecambe Offshore Wind Farm: Generation Assets	0.000	0.016	0.0	0.0
Morgan Generation Assets	0.159	0.016	0.4	0.2
Ormonde	0.411	0.016	0.0	0.0
Twinhub	No connectivity	0.016	-	0.2
Walney 3 + 4	0.411	0.016	17.0	0.4
White Cross	No connectivity	0.016	-	0.0
Annual total			19.5	

1.5.3.30 The total potential in-combination impact on herring gull at the Morecambe Bay and Duddon Estuary SPA / Morecambe Bay Ramsar site is 19.5 collisions/annum. This represents a 7.57% increase in the baseline mortality of the population at the SPA.

Herring gull as a feature of the Morecambe Bay and Duddon Estuary SPA / Morecambe Bay Ramsar site has therefore been progressed to the Integrity test: Step 2.

Ribble and Alt Estuaries SPA / Ribble and Alt Estuaries Ramsar site

1.5.3.31 The Step 1 integrity test for the Ribble and Alt Estuaries SPA / Ribble and Alt Estuaries Ramsar site is presented below for the Morgan Generation Assets alone (Table 1.10). The assessment considers the lesser black-backed gull feature of the SPA in relation to potential collision risk impacts. The population at the SPA was sourced from Burnell *et al.* (2023).

Table 1.10: Step 1 integrity test for the Ribble and Alt Estuaries SPA / Ribble and Alt Estuaries Ramsar site from the Morgan Generation Assets acting alone.

Qualifying feature	Seasonal apportioning values				Total predicted impact (birds/annum)	SPA population (breeding adults)	% increase in baseline mortality	Conclusion
	Breeding	Post-breeding	Non-breeding	Pre-breeding				
Lesser black-backed gull	0.197	0.051	0.080	0.051	<0.1 to 0.1	8,978	<0.01 to 0.01	No potential for AEOI

1.5.3.32 The predicted impact of the Morgan Generation Assets alone on the lesser black-backed gull feature of the Ribble and Alt Estuaries SPA / Ribble and Alt Estuaries Ramsar site represents less than a 0.05% increase in baseline mortality of the population at this SPA. The impact magnitude for lesser black-backed gull is also lower than 0.5 birds/annum. There is therefore considered to be no AEOI of the Ribble and Alt Estuaries SPA / Ribble and Alt Estuaries Ramsar site as a result of potential impacts on lesser black-backed gull from the Morgan Generation Assets.

1.5.3.33 No in-combination assessment has been undertaken for lesser black-backed gull as the potential impact from the Morgan Generation Assets alone is predicted to be less than a 0.05% increase in baseline mortality. Therefore, it is considered that the Morgan Generation Assets will not make a measurable contribution to the existing in-combination impact. It can be concluded beyond reasonable scientific doubt that there is no risk of an AEOI on the Ribble and Alt Estuaries SPA / Ribble and Alt Estuaries Ramsar site as a result of collision risk with respect to the operations and maintenance phase of the Morgan Generation Assets alone and in-combination with other plans and projects. The Ribble and Alt Estuaries SPA / Ribble and Alt Estuaries Ramsar site are not taken through to the integrity test: Step 2 and therefore potential impacts on the lesser black-backed gull feature of the Ribble and Alt Estuaries SPA / Ribble and Alt Estuaries Ramsar site have not been considered further.

Irish Sea Front SPA

1.5.3.34 The Irish Sea Front SPA was designated to protect a sea area utilised by Manx shearwaters from a number of SPAs for which LSE was identified in relation to potential impacts on Manx shearwater (Copeland Islands SPA, Glannau Aberdaron ac Ynys Enlli / Aberdaron Coast and Bardsey Island SPA and Skomer, Skokholm and the seas off Pembrokeshire / Sgomer, Sgogwm a moroedd Benfro SPA (JNCC, 2016)). Conclusions of no adverse effect have been reached for these SPAs with this conclusion therefore considered to be equally applicable to the Irish Sea Front SPA.

1.5.3.35 No in-combination assessment has been undertaken for Manx shearwater at those SPAs from which birds may utilise the Irish Sea Front SPA as the potential impact from the Morgan Generation Assets alone is predicted to be less than a 0.05% increase in baseline mortality. Therefore, it is considered that the Morgan Generation Assets will not make a measurable contribution to the existing in-combination impact at these sites or the Irish Sea Front SPA. It can therefore be concluded beyond reasonable scientific doubt that there is no risk of an AEOI on the Irish Sea Front SPA as a result of disturbance and displacement from airborne sound and presence of vessels and infrastructure with respect to operations and maintenance of the Morgan Generation Assets alone and in-combination with other plans and projects. The Irish Sea Front SPA has not been taken through to the integrity test: Step 2 and therefore potential impacts on the Manx shearwater feature of the Irish Sea Front SPA have not been considered further.

Bowland Fells SPA

1.5.3.36 The Step 1 integrity test for the Bowland Fells SPA is presented below for the Morgan Generation Assets alone (Table 1.11). The assessment considers the lesser black-backed gull feature of the SPA in relation to potential collision risk impacts. The population at the SPA was sourced from Burnell *et al.* (2023).

Table 1.11: Step 1 integrity test for the Bowland Fells SPA from the Morgan Generation Assets acting alone.

Qualifying feature	Seasonal apportioning values				Total predicted impact (birds/annum)	SPA population (breeding adults)	% increase in baseline mortality	Conclusion
	Breeding	Post-breeding	Non-breeding	Pre-breeding				
Lesser black-backed gull	0.358	0.028	0.044	0.028	0.1 to 0.1	29,254	<0.01 to <0.01	No potential for AEOI

1.5.3.37 The predicted impact of the Morgan Generation Assets alone on the lesser black-backed gull feature of the Bowland Fells SPA represents less than a 0.01% to 0.01% increase in baseline mortality of the population at the SPA. The impact magnitude for lesser black-backed gull is also lower than 0.5 birds/annum, noting that there is considerable precaution in the assessment. There is therefore considered to be no AEOI the Bowland Fells SPA as a result of potential impacts on lesser black-backed gull from the Morgan Generation Assets.

1.5.3.38 No in-combination assessment has been undertaken for lesser black-backed gull as the potential impact from the Morgan Generation Assets alone is predicted to be less than a 0.05% increase in baseline mortality. Therefore, it is considered that the Morgan Generation Assets will not make a measurable contribution to the existing in-combination impact. It can be concluded beyond reasonable scientific doubt that there is no risk of an AEOI on the Bowland Fells SPA as a result of collision risk with respect to operations and maintenance of the Morgan Generation Assets alone and in-combination with other plans and projects. The Bowland Fells SPA has not been taken through to the integrity test: Step 2 and therefore potential impacts on the lesser black-backed gull feature of the Bowland Fells SPA have not been considered further.

North-west Irish Sea SPA

1.5.3.39 A LSE was identified in relation to impacts associated with the kittiwake, herring gull, guillemot and razorbill features of the North-west Irish Sea SPA. The North-west Irish Sea SPA is designated to protect important areas utilised by species breeding at adjacent breeding SPAs as well as the wintering areas of a number of other species. In relation to kittiwake this includes the following SPAs: Lambay Island SPA, Ireland's Eye SPA and Howth Head Coast SPA. For herring gull, guillemot and razorbill this includes Lambay Island SPA. Conclusions of no adverse effect have been reached for Lambay Island SPA and Howth Head Coast SPA for all species with these conclusions therefore considered to be equally applicable to the North-west Irish Sea SPA. However, further consideration is required in relation to potential impacts on the kittiwake feature of the Ireland’s Eye SPA due to the estimated in-combination impact applicable to the species exceeding 1% of the SPA population and therefore the North-west Irish Sea SPA has been progressed to the integrity test: Step 2 in relation to impacts on kittiwake only.

Copeland Islands SPA

1.5.3.40 The Step 1 integrity test for the Copeland Islands SPA is presented below for the Morgan Generation Assets alone (Table 1.12). The assessment considers the Manx shearwater feature of the SPA in relation to disturbance and displacement from airborne sound and presence of vessels and infrastructure. The population at the SPA is from 2007 and was sourced from Burnell *et al.* (2023).

Table 1.12: Step 1 integrity test for the Copeland Islands SPA from the Morgan Generation Assets acting alone.

Qualifying feature	Seasonal apportioning values			Total predicted impact (birds/annum)	SPA population (breeding adults)	% increase in baseline mortality	Conclusion
	Breeding	Post-breeding	Pre-breeding				
Manx shearwater	0.035	0.006	0.006	0.2	9,700	0.02	No potential for AEOI

1.5.3.41 The predicted impact of the Morgan Generation Assets alone on the Manx shearwater feature of the Copeland Islands SPA represents less than a 0.05% increase in baseline mortality of the SPA population. The impact magnitude for Manx shearwater is also lower than 0.5 birds/annum, noting that there is considerable precaution in the assessment. There is therefore considered to be no adverse effect on the site integrity of the Copeland Islands SPA as a result of potential impacts on Manx shearwater from the Morgan Generation Assets.

1.5.3.42 No in-combination assessment has been undertaken for Manx shearwater as the impact from the Morgan Generation Assets alone is predicted to be less than a 0.05% increase in baseline mortality. Therefore, it is considered that the Morgan Generation Assets will not make a measurable contribution to the existing in-combination potential impact. It can be concluded beyond reasonable scientific doubt that there is no risk of an AEOI on the Copeland Islands SPA as a result of disturbance and displacement from airborne sound and presence of vessels and infrastructure with respect to operations and maintenance of the Morgan Generation Assets alone and in-combination with other plans and projects. The Copeland Islands SPA has not been taken through to the integrity test: Step 2 and therefore impacts on the Manx shearwater feature of the Copeland Islands SPA have not been considered further.

Glannau Aberdaron ac Ynys Enlli / Aberdaron Coast and Bardsey Island SPA

1.5.3.43 The Step 1 integrity test for the Glannau Aberdaron ac Ynys Enlli/Aberdaron Coast and Bardsey Island SPA is presented below for the Morgan Generation Assets alone (Table 1.13). The assessment considers the Manx shearwater feature of the SPA in relation to disturbance and displacement from airborne sound and presence of vessels and infrastructure. The population at the SPA is from 2001 and was sourced from Burnell *et al.* (2023).

Table 1.13: Step 1 integrity test for the Glannau Aberdaron ac Ynys Enlli/Aberdaron Coast and Bardsey Island SPA from the Morgan Generation Assets acting alone.

Qualifying feature	Seasonal apportioning values			Total predicted potential impact (birds/annum)	SPA population (breeding adults)	% increase in baseline mortality	Conclusion
	Breeding	Post-breeding	Pre-breeding				
Manx shearwater	0.085	0.020	0.020	0.6	41,350	0.01	No potential for AEOI

1.5.3.44 The predicted potential impact of the Morgan Generation Assets alone on the Manx shearwater feature of the Glannau Aberdaron ac Ynys Enlli/Aberdaron Coast and Bardsey Island SPA represents less than a 0.05% increase in baseline mortality of the SPA population. The potential impact magnitude for Manx shearwater is also lower than one bird/annum, noting that there is considerable precaution in the assessment. There is therefore considered to be no AEOI of the Glannau Aberdaron ac Ynys Enlli/Aberdaron Coast and Bardsey Island SPA as a result of potential impacts on Manx shearwater from the Morgan Generation Assets.

1.5.3.45 No in-combination assessment has been undertaken for Manx shearwater as the potential impact from the Morgan Generation Assets alone is predicted to be less than a 0.05% increase in baseline mortality. Therefore, it is considered that the Morgan Generation Assets will not make a measurable contribution to the existing in-combination impact. It can be concluded beyond reasonable scientific doubt that there is no risk of an AEOI on the Glannau Aberdaron ac Ynys Enlli/Aberdaron Coast and Bardsey Island SPA as a result of disturbance and displacement from airborne sound and presence of vessels and infrastructure with respect to operations and maintenance of the Morgan Generation Assets alone and in-combination with other plans and projects. The Glannau Aberdaron ac Ynys Enlli/Aberdaron Coast and Bardsey Island SPA has not been taken through to the integrity test: Step 2 and therefore potential impacts on the Manx shearwater feature of the Glannau Aberdaron ac Ynys Enlli/Aberdaron Coast and Bardsey Island SPA have not been considered further.

Lambay Island SPA

1.5.3.46 The Step 1 integrity test for the Lambay Island SPA is presented below for the Morgan Generation Assets alone (Table 1.14). The assessment considers the kittiwake feature of the SPA in relation to potential disturbance and displacement from airborne sound and presence of vessels and infrastructure and collision risk impacts, the herring gull feature of the SPA in relation to potential collision risk impacts and the guillemot and razorbill features of the SPA in relation to potential disturbance and displacement from airborne sound and presence of vessels and infrastructure. The populations at the SPA were sourced from Burnell *et al.* (2023).

Table 1.14: Step 1 integrity test for the Lambay Island SPA from the Morgan Generation Assets acting alone.

Qualifying feature	Seasonal apportioning values				Total predicted impact (birds/annum)	SPA population (breeding adults)	% increase in baseline mortality	Conclusion
	Breeding	Post-breeding	Non-breeding	Pre-breeding				
Kittiwake	0.033	0.003	N/A	0.004	0.2 to 0.5	6,640	0.02 to <0.05	No potential for AEOI
Herring gull (non-breeding season)	No connectivity	N/A	0.017	N/A	0.1 to 0.1	1,812	0.02 to 0.04	No potential for AEOI
Guillemot (non-breeding season)	No connectivity	N/A	0.059	N/A	1.1	80,377	0.02	No potential for AEOI
Razorbill (non-breeding seasons)	No connectivity	0.010	0.017	0.010	0.1	9,853	0.01	No potential for AEOI

1.5.3.47 The predicted impact of the Morgan Generation Assets alone on the kittiwake feature of the Lambay Island SPA when combining collision and displacement impacts represents less than a 0.05% increase in baseline mortality of the SPA population. The impact magnitude for kittiwake is also lower than 0.5 birds/annum, noting that there is considerable precaution in the assessment. There is therefore considered to be no adverse effect on the site integrity of the Lambay Island SPA as a result of potential impacts on kittiwake from the Morgan Generation Assets.

1.5.3.48 The predicted impact of the Morgan Generation Assets alone on the herring gull feature of the Lambay Island SPA when considering collision impacts represents less than a 0.05% increase in baseline mortality of the SPA population. The impact magnitude for herring gull is also lower than 0.5 birds/annum, noting that there is considerable precaution in the assessment. There is therefore considered

to be no adverse effect on the site integrity of the Lambay Island SPA as a result of potential impacts on herring gull from the Morgan Generation Assets.

1.5.3.49 The predicted impact of the Morgan Generation Assets alone on the guillemot and razorbill features of the Lambay Island SPA when considering displacement impacts represents less than a 0.05% increase in baseline mortality of the SPA population. The impact magnitude for razorbill is also lower than 0.5 birds/annum, noting that there is considerable precaution in the assessment. There is therefore considered to be no adverse effect on the site integrity of the Lambay Island SPA as a result of potential impacts on guillemot and razorbill from the Morgan Generation Assets.

1.5.3.50 No in-combination assessment has been undertaken for kittiwake, herring gull, guillemot and razorbill as the potential impact from the Morgan Generation Assets alone is predicted to be less than a 0.05% increase in baseline mortality. Therefore, it is considered that the Morgan Generation Assets will not make a measurable contribution to the existing in-combination impact. It can be concluded beyond reasonable scientific doubt that there is no risk of an AEOI on the Lambay Island SPA as a result of disturbance and displacement from airborne sound and presence of vessels and infrastructure and/or collision risk with respect to operations and maintenance of the Morgan Generation Assets alone and in-combination with other plans and projects. The Lambay Island SPA has not been taken through to the integrity test: Step 2 and therefore potential impacts on the kittiwake, herring gull, guillemot and razorbill features of the Lambay Island SPA have not been considered further.

Ireland's Eye SPA

1.5.3.51 The Step 1 integrity test for the Ireland's Eye SPA is presented below for the Morgan Generation Assets alone (Table 1.15). The assessment considers the kittiwake feature of the SPA in relation to potential disturbance and displacement from airborne sound and presence of vessels and infrastructure and collision risk impacts. The population at the SPA was sourced from Burnell *et al.* (2023).

Table 1.15: Step 1 integrity test for the Ireland's Eye SPA from the Morgan Generation Assets acting alone.

Qualifying feature	Seasonal apportioning values			Total predicted impact (birds/annum)	SPA population (breeding adults)	% increase in baseline mortality	Conclusion
	Breeding	Post-breeding	Pre-breeding				
Kittiwake	0.019	0.001	0.001	0.1 to 0.2	910	0.07 to 0.17	No potential for AEOI from the Morgan Generation Assets alone

1.5.3.52 The predicted impact of the Morgan Generation Assets alone on the kittiwake feature of the Ireland's Eye SPA represents more than a 0.05% increase in baseline mortality of the SPA population when combining displacement and collision impacts. However, the impact magnitude for kittiwake is lower than 0.5 birds/annum, noting that there is considerable precaution in the assessment.

1.5.3.53 As the impact represents more than a 0.05% increase in the baseline mortality consideration is given to the existing in-combination impact (Table 1.16).

Table 1.16: Step 1 integrity test for the kittiwake feature of the Ireland's Eye SPA from the Morgan Generation Assets acting in combination with other projects/plans in relation to potential disturbance and displacement from airborne noise, underwater sound, and presence of vessels and infrastructure and collision risk impacts.

a – apportioning value unavailable, assumed to be the same as the Morgan Generation Assets

b – apportioning value unavailable, assumed to be the same as Erebus offshore wind farm

Project	Seasonal apportioning values			Seasonal abundance values			Seasonal apportioned collision impacts		
	Breeding	Post-breeding	Pre-breeding	Breeding	Post-breeding	Pre-breeding	Breeding	Post-breeding	Pre-breeding
Awel y Môr	0.010	0.001	0.001	4.8	0.1	0.3	0.2	0.0	0.0
Burbo Bank Extension	0.013[a]	0.001	0.001	24.4	0.2	0.1	0.4	0.0	0.0
Erebus	0.016	0.001	0.001	0.0	1.3	0.4	0.0	0.0	0.0
Mona Offshore Wind Project	0.016	0.001	0.001	5.7	0.3	0.7	0.0	0.0	0.0
Morecambe Offshore Wind Farm: Generation Assets	0.013[a]	0.001	0.001	48.6	1.6	0.5	0.3	0.0	0.0
Morgan Generation Assets	0.013	0.001	0.001	9.4	0.7	0.6	0.1	0.0	0.0
Ormonde	0.013	0.001	0.001	1.1	Unavailable		0.0	0.0	0.0
Rampion	No connectivity	0.001	0.001	-	0.3	0.3	0.0	0.0	0.0
Rampion 2	No connectivity	0.001	0.001	-	0.1	0.2	0.0	0.0	0.0

Project	Seasonal apportioning values			Seasonal abundance values			Seasonal apportioned collision impacts		
	Breeding	Post-breeding	Pre-breeding	Breeding	Post-breeding	Pre-breeding	Breeding	Post-breeding	Pre-breeding
Twinhub	No connectivity	0.001	0.001	-	0.1	Unavailable	-	0.0	0.0
Walney 3 + 4	0.013[a]	0.001	0.001	3.0	0.4	0.3	0.4	0.0	0.0
West of Duddon Sands	0.013[a]	0.001	0.001	8.4	Unavailable	Unavailable			
West of Orkney	No connectivity	0.001	0.001	-	0.4	0.2	0.0	0.0	0.0
White Cross	0.016[b]	0.001	0.001	0.7	0.1	0.4	0.0	0.0	0.0
Annual total				115.5			1.7		

1.5.3.54 The in-combination collision risk impact is 1.7 collisions/annum. This represents a 1.26% increase in the baseline mortality of the population at the SPA. On a precautionary basis the kittiwake feature of the Ireland's Eye SPA is therefore progressed to the Integrity test: Step 2 in relation to potential collision risk impacts.

1.5.3.55 The in-combination displacement impact (assuming a 50% displacement rate and 1% mortality rate) is 0.6 birds/annum. This represents a 0.43% increase in the baseline mortality of the population at the SPA. Displacement impacts on the kittiwake feature of the Ireland's Eye SPA are therefore not progressed to the Integrity test: Step 2 as an individual impact.

1.5.3.56 The combined in-combination impact (assuming a 50% displacement rate and 1% mortality rate) is 2.2 birds/annum. This represents a 1.69% increase in the baseline mortality of the population at the SPA. On a precautionary basis the kittiwake feature of the Ireland's Eye SPA is therefore progressed to the Integrity test: Step 2 in relation to the combined impact of displacement and collision.

Howth Head Coast SPA

1.5.3.57 The Step 1 integrity test for the Howth Head Coast SPA is presented below for the Morgan Generation Assets alone (Table 1.17). The assessment considers the kittiwake feature of the SPA in relation to potential disturbance and displacement from airborne sound and presence of vessels and infrastructure and collision risk impacts. The population at the SPA was sourced from Burnell *et al.* (2023).

Table 1.17: Step 1 integrity test for the Howth Head Coast SPA from the Morgan Generation Assets acting alone.

Qualifying feature	Seasonal apportioning values			Total predicted impact (birds/annum)	SPA population (breeding adults)	% increase in baseline mortality	Conclusion
	Breeding	Post-breeding	Pre-breeding				
Kittiwake	0.027	0.002	0.002	0.1 to 0.4	3,546	0.03 to 0.06	No potential for AEOI from the Morgan Generation Assets alone

1.5.3.58 The predicted impact of the Morgan Generation Assets alone on the kittiwake feature of the Howth Head Coast SPA represents more than a 0.05% increase in baseline mortality of the population at the SPA. However, the impact magnitude for kittiwake is lower than 0.5 birds/annum, noting that there is considerable precaution in the assessment. As the potential impact represents more than a 0.05% increase in baseline mortality consideration is given to the existing in-combination impact (Table 1.18).

Table 1.18: Step 1 integrity test for the kittiwake feature of the Howth Head Coast SPA from the Morgan Generation Assets acting in combination with other projects/plans in relation to potential disturbance and displacement from airborne noise, underwater sound, and presence of vessels and infrastructure and collision risk impacts.

a – apportioning value unavailable, assumed to be the same as the Morgan Generation Assets

b – apportioning value unavailable, assumed to be the same as Erebus offshore wind farm

Project	Seasonal apportioning values			Seasonal abundance values			Seasonal apportioned collision impacts		
	Breeding	Post-breeding	Pre-breeding	Breeding	Post-breeding	Pre-breeding	Breeding	Post-breeding	Pre-breeding
Awel y Môr	0.020	0.002	0.002	9.5	0.3	0.8	0.3	0.0	0.0
Burbo Bank Extension	0.027[a]	0.002	0.002	35.2	0.4	0.3	0.5	0.0	0.0
Erebus	0.033	0.002	0.002	0.1	3.1	1.0	0.0	0.0	0.0
Mona Offshore Wind Project	0.018	0.002	0.002	6.4	0.9	1.8	0.1	0.0	0.0
Morecambe Offshore Wind Farm: Generation Assets	0.027[a]	0.002	0.002	70.1	3.9	1.1	0.1	0.0	0.0
Morgan Generation Assets	0.027	0.002	0.002	13.5	1.8	1.6	0.2	0.0	0.0
Ormonde	0.027[a]	0.002	0.002	1.6	Unavailable		0.0	0.0	0.0
Rampion	No connectivity	0.002	0.002	-	0.7	0.8	0.0	0.0	0.0
Rampion 2	No connectivity	0.002	0.002	-	0.1	0.6	0.0	0.1	0.0
Twinhub	No connectivity	0.002	0.002	-	0.2	Unavailable	-	0.0	0.0

Project	Seasonal apportioning values			Seasonal abundance values			Seasonal apportioned collision impacts		
	Breeding	Post-breeding	Pre-breeding	Breeding	Post-breeding	Pre-breeding	Breeding	Post-breeding	Pre-breeding
Walney 3 + 4	0.027[a]	0.002	0.002	4.3	1.0	0.7	0.5	0.1	0.1
West of Duddon Sands	0.027[a]	0.002	0.002	12.1	Unavailable	Unavailable			
West of Orkney	No connectivity	0.002	0.002	-	0.0	0.0	-	0.0	0.0
White Cross	0.033[b]	0.002	0.002	1.2	0.1	0.9	0.0	0.0	0.0
Annual total				176			2.7		

1.5.3.59 The total potential in-combination impact from disturbance and displacement from airborne noise, underwater sound, and presence of vessels and infrastructure and collision risk(when assuming a 50% displacement rate and 1% mortality rate) is 3.6 birds/annum. This represents a 0.53% or 0.70% increase in the baseline mortality of the kittiwake population at the Howth Head Coast SPA. As this is below the 1% baseline mortality threshold it is considered that there is no AEOI of the Howth Head Coast SPA as a result of potential impacts associated with the Morgan Generation Assets alone or in-combination. It can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Howth head Coast SPA as a result of displacement with respect to construction of the Morgan Generation Assets alone and in-combination with other plans and projects. The Howth Head Coast SPA has not been taken through to the integrity test: Step 2 and therefore potential impacts on the kittiwake feature of the Howth Head Coast SPA have not been considered further.

Ailsa Craig SPA

1.5.3.60 The Step 1 integrity test for the Ailsa Craig SPA is presented below for the Morgan Generation Assets alone (Table 1.19). The assessment considers the kittiwake and gannet features of the SPA in relation to potential disturbance and displacement from airborne sound and presence of vessels and infrastructure and collision risk impacts. The population at the SPA for kittiwake was sourced from Burnell *et al.* (2023). The population at the SPA for gannet is 2023 and was sourced from the SMP database (JNCC, 2023).

Table 1.19: Step 1 integrity test for the Ailsa Craig SPA from the Morgan Generation Assets acting alone.

Qualifying feature	Seasonal apportioning values				Total predicted impact (birds/annum)	SPA population (breeding adults)	% increase in baseline mortality	Conclusion
	Breeding	Post-breeding	Non-breeding	Pre-breeding				
Kittiwake	0.002	0.001	N/A	0.001	<0.1 to 0.1	980	0.02 to 0.04	No potential for AEOI
Gannet	0.539	0.099	N/A	0.082	1.3 to 1.3	66,452	0.03 to 0.03	No potential for AEOI

1.5.3.61 The predicted impact of the Morgan Generation Assets alone on the kittiwake and gannet features of the Ailsa Craig SPA represents less than a 0.05% increase in baseline mortality of the SPA population. The impact magnitude for kittiwake is also lower than 0.5 birds/annum, noting that there is considerable precaution in the assessment. There is therefore considered to be no AEOI of the Ailsa Craig SPA as a result of potential impacts on kittiwake and gannet from the Morgan Generation Assets.

1.5.3.62 No in-combination assessment has been undertaken for kittiwake and gannet as the potential impact from the Morgan Generation Assets alone is predicted to be less than a 0.05% increase in baseline mortality. Therefore, it is considered that the Morgan Generation Assets will not make a measurable contribution to the existing in-combination impact. It can be concluded beyond reasonable scientific doubt that there is no risk of an AEOI on the Ailsa Craig SPA as a result of disturbance and displacement from airborne sound and presence of vessels and infrastructure and collision risk for relevant features with respect to operations and maintenance of the Morgan Generation Assets alone and in-combination with other plans and projects. The Ailsa Craig SPA has not been taken through to the integrity test: Step 2 and therefore potential impacts on the kittiwake and gannet features of the Ailsa Craig SPA have not been considered further.

Wicklow Head SPA

1.5.3.63 The Step 1 integrity test for the Wicklow Head SPA is presented below for the Morgan Generation Assets alone (Table 1.20). The assessment considers the kittiwake feature of the SPA in relation to potential disturbance and displacement from airborne sound and presence of vessels and infrastructure and collision risk impacts. The population at the SPA is from 2022 and was sourced from the SMP database (JNCC, 2023).

Table 1.20: Step 1 integrity test for the Wicklow Head SPA from the Morgan Generation Assets acting alone.

Qualifying feature	Seasonal apportioning values			Total predicted impact (birds/annum)	SPA population (breeding adults)	% increase in baseline mortality	Conclusion
	Breeding	Post-breeding	Pre-breeding				
Kittiwake	0.004	0.001	0.001	<0.1 to 0.1	1,414	0.02 to 0.04	No potential for AEOI

1.5.3.64 The predicted impact of the Morgan Generation Assets alone on the kittiwake feature of the Wicklow Head SPA represents less than a 0.05% increase in baseline mortality. The impact magnitude for kittiwake is also lower than 0.5 birds/annum, noting that there is considerable precaution in the assessment. There is therefore considered to be no adverse effect on the site integrity of the Wicklow Head SPA as a result of potential impacts on kittiwake from the Morgan Generation Assets.

1.5.3.65 No in-combination assessment has been undertaken for kittiwake as the potential impact from the Morgan Generation Assets alone is predicted to be less than a 0.05% increase in baseline mortality. Therefore, it is considered that the Morgan Generation Assets will not make a measurable contribution to the existing in-combination impact. It can be concluded beyond reasonable scientific doubt that there is no risk of an AEOI on the Wicklow Head SPA as a result of disturbance and displacement from airborne sound and presence of vessels and infrastructure and/or collision risk with respect to operations and maintenance of the Morgan Generation Assets alone and in-combination with other plans and projects. The Wicklow Head SPA has not been taken through to the integrity test: Step 2 and therefore potential impacts on the kittiwake feature of the Wicklow Head SPA have not been considered further.

Rathlin Island SPA

1.5.3.66 The Step 1 integrity test for the Rathlin Island SPA is presented below for the Morgan Generation Assets alone (Table 1.21). The assessment considers the kittiwake feature of the SPA in relation to potential disturbance and displacement from airborne sound and presence of vessels and infrastructure and collision risk impacts. The assessment also considers the guillemot and razorbill features of the SPA in relation to disturbance and displacement from airborne sound and presence of vessels and infrastructure. The population at the SPA for all features was sourced from Burnell *et al.* (2023).

Table 1.21: Step 1 integrity test for the Rathlin Island SPA from the Morgan Generation Assets acting alone.

Qualifying feature	Seasonal apportioning values				Total predicted impact (birds/annum)	SPA population (breeding adults)	% increase in baseline mortality	Conclusion
	Breeding	Post-breeding	Non-breeding	Pre-breeding				
Kittiwake	0.040	0.010	N/A	0.018	0.4	27,412	0.01	No potential for AEOI
Guillemot	No connectivity	N/A	0.153	N/A	2.9	200,343	0.02	No potential for AEOI
Razorbill	No connectivity	0.050	0.036	0.050	0.2 to 0.4	44,842	<0.01 to 0.01	No potential for AEOI

1.5.3.67 The predicted impact of the Morgan Generation Assets alone on the kittiwake, guillemot and razorbill features of the Rathlin Island SPA represents less than a 0.05% increase in baseline mortality. The potential impact magnitudes for kittiwake and razorbill are also lower than one bird/annum, noting that there is considerable precaution in the assessment. There is therefore considered to be no adverse effect on the site integrity of the Rathlin Island SPA as a result of potential impacts on kittiwake and razorbill from the Morgan Generation Assets.

1.5.3.68 No in-combination assessment has been undertaken for kittiwake, guillemot and razorbill as the potential impact from the Morgan Generation Assets alone is predicted to be less than a 0.05% increase in baseline mortality. Therefore, it is considered that the Morgan Generation Assets will not make a measurable contribution to the existing in-combination impact. It can be concluded beyond reasonable scientific doubt that there is no risk of an AEOI on the Rathlin Island SPA as a result of disturbance and displacement from airborne sound and presence of vessels and infrastructure and collision risk for relevant features with respect to operations and maintenance of the Morgan Generation Assets alone and in-combination with other plans and projects. The Rathlin Island SPA has not been taken through to the integrity test: Step 2 and therefore potential impacts on the kittiwake, guillemot and razorbill features of the Rathlin Island SPA have not been considered further.

Forth Islands SPA

1.5.3.69 The Step 1 integrity test for the Forth Islands SPA is presented below for the Morgan Generation Assets alone (Table 1.22). The assessment considers the gannet feature of the SPA in relation to potential disturbance and displacement from airborne sound and presence of vessels and infrastructure and collision risk impacts. The population at the SPA was sourced from Burnell *et al.* (2023).

Table 1.22: Step 1 integrity test for the Forth Islands SPA from the Morgan Generation Assets acting alone.

Qualifying feature	Seasonal apportioning values			Total predicted impact (birds/annum)	SPA population (breeding adults)	% increase in baseline mortality	Conclusion
	Breeding	Post-breeding	Pre-breeding				
Gannet	No connectivity	<0.001	0.050	<0.1 to <0.1	150,518	<0.01 to <0.01	No potential for AEOI

1.5.3.70 The predicted impact of the Morgan Generation Assets alone on the gannet feature of the Forth Islands SPA represents less than a 0.05% increase in baseline mortality of the SPA population. The impact magnitude for gannet is also lower than 0.5 birds/annum, noting that there is considerable precaution in the assessment. There is therefore considered to be no adverse effect on the site integrity of the Forth Islands SPA as a result of potential impacts on gannet from the Morgan Generation Assets.

1.5.3.71 No in-combination assessment has been undertaken for gannet as the potential impact from the Morgan Generation Assets alone is predicted to be less than a 0.05% increase in baseline mortality. Therefore, it is considered that the Morgan Generation Assets will not make a measurable contribution to the existing in-combination impact. It can be concluded beyond reasonable scientific doubt that there is no risk of an AEOI on the Forth Islands SPA as a result of disturbance and displacement from airborne sound and presence of vessels and infrastructure and/or collision risk with respect to operations and maintenance of the Morgan Generation Assets alone and in-combination with other plans and projects. The Forth Islands SPA has not been taken through to the integrity test: Step 2 and therefore potential impacts on the gannet feature of the Forth Islands SPA have not been considered further.

Flamborough and Filey Coast SPA

1.5.3.72 The Step 1 integrity test for the Flamborough and Filey Coast SPA is presented below for the Morgan Generation Assets alone (Table 1.23). The assessment considers the kittiwake feature of the SPA in relation to potential disturbance and displacement from airborne sound and presence of vessels and infrastructure and collision risk impacts. The population at the SPA was sourced from Clarkson *et al.* (2022).

Table 1.23: Step 1 integrity test for the Flamborough and Filey Coast SPA from the Morgan Generation Assets acting alone.

Qualifying feature	Seasonal apportioning values			Total predicted impact (birds/annum)	SPA population (breeding adults)	% increase in baseline mortality	Conclusion
	Breeding	Post-breeding	Pre-breeding				
Kittiwake	No connectivity	0.017	0.033	0.4 to 1.0	91,008	<0.01 to 0.01	No potential for AEOI

1.5.3.73 The predicted impact pf the Morgan Generation Assets alone on the kittiwake feature of the Flamborough and Filey Coast SPA consists of 0.2 to 0.7 collisions/annum and 0.2 birds/annum affected by to potential disturbance and displacement from airborne sound and presence of vessels and infrastructure. The combined predicted impact of the Morgan Generation Assets alone on the kittiwake feature of the Flamborough and Filey Coast SPA represents less than a 0.05% increase in baseline mortality of the SPA population. The potential impact magnitude for kittiwake is also lower than one bird/annum, noting that there is considerable precaution in the assessment. There is therefore considered to be no adverse effect on the site integrity of the Flamborough and Filey Coast SPA as a result of potential impacts on kittiwake from the Morgan Generation Assets.

1.5.3.74 No in-combination assessment has been undertaken for kittiwake as the potential impact from the Morgan Generation Assets alone is predicted to be less than a 0.05% increase in baseline mortality. Therefore, it is considered that the Morgan Generation Assets will not make a measurable contribution to the existing in-combination impact. It can be concluded beyond reasonable scientific doubt that there is no risk of an AEOI on the Flamborough and Filey Coast SPA as a result of disturbance and displacement from airborne sound and presence of vessels and infrastructure and/or collision risk with respect to operations and maintenance of the Morgan Generation Assets alone and in-combination with other plans and projects. The Flamborough and Filey Coast SPA has not been taken through to the integrity test: Step 2 and therefore potential impacts on the kittiwake feature of the Flamborough and Filey Coast SPA have not been considered further.

Skomer, Skokholm and the Seas off Pembrokeshire / Sgomer, Sgogwm a moroedd Benfro SPA

1.5.3.75 The Step 1 integrity test for the Skomer, Skokholm and the Seas off Pembrokeshire / Sgomer, Sgogwm a moroedd Benfro SPA is presented below for the Morgan Generation Assets alone (Table 1.24). The assessment considers the kittiwake feature of the SPA in relation to potential disturbance and displacement from airborne sound and presence of vessels and infrastructure and collision risk impacts. The assessment also considers the lesser black-backed gull feature of the SPA in relation to potential collision risk impacts and the guillemot, razorbill and Manx shearwater features of the SPA in relation to disturbance and displacement from airborne sound and presence of vessels and infrastructure. The population at the SPA for Manx shearwater is from 2018 and was sourced from the SMP database (JNCC, 2023). The population at the SPA for all other features is from 2022 and was sourced from Burnell *et al.* (2023).

Table 1.24: Step 1 integrity test for the Skomer, Skokholm and the Seas off Pembrokeshire SPA from the Morgan Generation Assets acting alone.

Qualifying feature	Seasonal apportioning values				Total predicted impact (birds/annum)	SPA population (breeding adults)	% increase in baseline mortality	Conclusion
	Breeding	Post-breeding	Non-breeding	Pre-breeding				
Kittiwake	0.002	0.001	N/A	0.002	<0.1 to 0.1	2,878	0.01 to 0.02	No potential for AEOI
Lesser black-backed gull	<0.001	0.083	0.094	0.083	<0.1 to 0.1	16,694	<0.01 to <0.01	No potential for AEOI
Guillemot	No connectivity	N/A	0.026	N/A	0.5	43,448	0.02	No potential for AEOI
Razorbill	No connectivity	0.019	0.011	0.019	0.1	15,975	0.01	No potential for AEOI
Manx shearwater	0.752	0.443	N/A	0.443	6.7	910,312	0.01	No potential for AEOI

1.5.3.76 The predicted impact of the Morgan Generation Assets alone on the kittiwake, lesser black-backed gull, guillemot, razorbill and Manx shearwater features of the Skomer, Skokholm and the Seas off Pembrokeshire/Sgomer, Sgogwm a moroedd Benfro SPA represents less than a 0.05% increase in baseline mortality of the respective SPA populations. The potential impact magnitude for kittiwake,

lesser black-backed gull and razorbill is also lower than 0.5 birds/annum, noting that there is considerable precaution in the assessment. There is therefore considered to be no adverse effect on the site integrity of the Skomer, Skokholm and the Seas off Pembrokeshire/Sgomer, Sgogwm a moroedd Benfro SPA as a result of potential impacts on kittiwake, lesser black-backed gull, razorbill and Manx shearwater from the Morgan Generation Assets.

1.5.3.77 No in-combination assessment has been undertaken for kittiwake, lesser black-backed gull, guillemot, razorbill and Manx shearwater as the potential impact from the Morgan Generation Assets alone is predicted to be less than a 0.05% increase in baseline mortality. Therefore, it is considered that the Morgan Generation Assets will not make a measurable contribution to the existing in-combination impact. It can be concluded beyond reasonable scientific doubt that there is no risk of an AEOI on the Skomer, Skokholm and the Seas off Pembrokeshire/Sgomer, Sgogwm a moroedd Benfro SPA as a result of disturbance and displacement from airborne sound and presence of vessels and infrastructure and collision risk for relevant features with respect to operations and maintenance of the Morgan Generation Assets alone and in-combination with other plans and projects. The Skomer, Skokholm and the Seas off Pembrokeshire/Sgomer, Sgogwm a moroedd Benfro SPA has not been taken through to the integrity test: Step 2 and therefore potential impacts on the kittiwake, lesser black-backed gull, guillemot, razorbill and Manx shearwater features of the Skomer, Skokholm and the Seas off Pembrokeshire/Sgomer, Sgogwm a moroedd Benfro SPA have not been considered further.

North Colonsay and Western Cliffs SPA

1.5.3.78 The Step 1 integrity test for the North Colonsay and Western Cliffs SPA is presented below for the Morgan Generation Assets alone (Table 1.25). The assessment considers the kittiwake feature of the SPA in relation to potential disturbance and displacement from airborne sound and presence of vessels and infrastructure and collision risk impacts and the guillemot feature of the SPA in relation to potential disturbance and displacement from airborne sound and presence of vessels and infrastructure. The population at the SPA was sourced from Burnell *et al.* (2023).

Table 1.25: Step 1 integrity test for the North Colonsay and Western Cliffs SPA from the Morgan Generation Assets acting alone.

Qualifying feature	Seasonal apportioning values				Total predicted impact (birds/annum)	SPA population (breeding adults)	% increase in baseline mortality	Conclusion
	Breeding	Post-breeding	Non-breeding	Pre-breeding				
Kittiwake	No connectivity	0.007	N/A	0.013	0.2 to 0.4	6,694	0.02 to 0.04	No potential for AEOI
Guillemot	No connectivity	N/A	0.024	N/A	0.5	25,110	0.03	No potential for AEOI

1.5.3.79 The predicted impact of the Morgan Generation Assets alone on the kittiwake and guillemot features of the North Colonsay and Western Cliffs SPA represents less than a 0.05% increase in baseline mortality of the relevant SPA populations. The potential impact magnitude for both species is also lower than 0.5 birds/annum, noting that there is considerable precaution in the assessment. There is therefore considered to be no AEOI of the North Colonsay and Western Cliffs SPA as a result of potential impacts on kittiwake and guillemot from the Morgan Generation Assets.

1.5.3.80 No in-combination assessment has been undertaken for kittiwake and guillemot as the potential impact from the Morgan Generation Assets alone is predicted to be less than a 0.05% increase in baseline mortality. Therefore, it is considered that the Morgan Generation Assets will not make a measurable contribution to the existing in-combination impact. It can be concluded beyond reasonable scientific doubt that there is no risk of an AEOI on the North Colonsay and Western Cliffs SPA as a result of disturbance and displacement from airborne sound and presence of vessels and infrastructure and/or collision risk with respect to operations and maintenance of the Morgan Generation Assets alone and in-combination with other plans and projects. The North Colonsay and Western Cliffs SPA has not been taken through to the integrity test: Step 2 and therefore potential impacts on the kittiwake and guillemot features of the North Colonsay and Western Cliffs SPA have not been considered further.

Grassholm SPA

1.5.3.81 The Step 1 integrity test for the Grassholm SPA is presented below for the Morgan Generation Assets alone (Table 1.26). The assessment considers the gannet feature of the SPA in relation to potential disturbance and displacement from airborne sound and presence of vessels and infrastructure and collision risk impacts. The population at the SPA is from 2023 and was sourced from the SMP database (JNCC, 2023).

Table 1.26: Step 1 integrity test for the Grassholm SPA from the Morgan Generation Assets acting alone.

Qualifying feature	Seasonal apportioning values			Total predicted impact (birds/annum)	SPA population (breeding adults)	% increase in baseline mortality	Conclusion
	Breeding	Post-breeding	Pre-breeding				
Gannet	0.245	0.144	0.119	0.7 to 0.7	72,022	0.03 to 0.03	No potential for AEOI

1.5.3.82 The predicted impact of the Morgan Generation Assets alone on the gannet feature of the Grassholm SPA represents less than a 0.05% increase in baseline mortality of the SPA population. The potential impact magnitude for gannet is also lower than one bird/annum, noting that there is considerable precaution in the assessment. There is therefore considered to be no AEOI of the Grassholm SPA as a result of potential impacts on gannet from the Morgan Generation Assets.

1.5.3.83 No in-combination assessment has been undertaken for gannet as the potential impact from the Morgan Generation Assets alone is predicted to be less than a 0.05% increase in baseline mortality. Therefore, it is considered that the Morgan Generation Assets will not make a measurable contribution to the existing in-combination impact. It can be concluded beyond reasonable scientific doubt that there is no risk of an AEOI on the Grassholm SPA as a result of disturbance and displacement from airborne sound and presence of vessels and infrastructure and/or collision risk with respect to operations and maintenance of the Morgan Generation Assets alone and in-combination with other plans and projects. The Grassholm SPA has not been taken through to the integrity test: Step 2 and therefore potential impacts on the gannet feature of the Grassholm SPA have not been considered further.

Saltee Islands SPA

1.5.3.84 The Step 1 integrity test for the Saltee Islands SPA is presented below for the Morgan Generation Assets alone (Table 1.27). The assessment considers the kittiwake and gannet features of the SPA in relation to potential disturbance and displacement from airborne sound and presence of vessels and infrastructure and collision risk impacts and the guillemot and razorbill features of the SPA in relation to potential disturbance and displacement from airborne sound and presence of vessels and infrastructure. The population at the SPA for all features was sourced from Burnell *et al.* (2023).

Table 1.27: Step 1 integrity test for the Saltee Islands SPA from the Morgan Generation Assets acting alone.

Qualifying feature	Seasonal apportioning values				Total predicted impact (birds/annum)	SPA population (breeding adults)	% increase in baseline mortality	Conclusion
	Breeding	Post-breeding	Non-breeding	Pre-breeding				
Kittiwake	0.002	0.001	N/A	0.002	<0.1 to 0.1	2,076	0.01 to 0.03	No potential for AEOI
Guillemot (non-breeding season)	No connectivity	N/A	0.021	N/A	0.4	34,640	0.02	No potential for AEOI
Razorbill (non-breeding seasons)	No connectivity	0.008	0.015	0.008	0.1	7,596	0.01	No potential for AEOI
Gannet	0.031	0.002	N/A	0.002	0.1 to 0.1	9,444	0.01 to 0.01	No potential for AEOI

1.5.3.85 The predicted impact of the Morgan Generation Assets alone on the kittiwake, guillemot, razorbill and gannet features of the Saltee Islands SPA represents less than a 0.05% increase in baseline mortality of the relevant SPA population. The potential impact magnitude for all features is also lower than 0.5 birds/annum, noting that there is considerable precaution in the assessment. There is therefore considered to be no adverse effect on the site integrity of the Saltee Islands SPA as a result of potential impacts on kittiwake, guillemot, razorbill and gannet from the Morgan Generation Assets.

1.5.3.86 No in-combination assessment has been undertaken for kittiwake, guillemot, razorbill and gannet as the potential impact from the Morgan Generation Assets alone is predicted to be less than a 0.05% increase in baseline mortality. Therefore, it is considered that

the Morgan Generation Assets will not make a measurable contribution to the existing in-combination impact. It can be concluded beyond reasonable scientific doubt that there is no risk of an AEOI on the Saltee Islands SPA as a result of disturbance and displacement from airborne sound and presence of vessels and infrastructure and/or collision risk with respect to operations and maintenance of the Morgan Generation Assets alone and in-combination with other plans and projects. The Saltee Islands SPA has not been taken through to the integrity test: Step 2 and therefore potential impacts on the kittiwake, guillemot, razorbill and gannet features of the Saltee Islands SPA have not been considered further.

Rum SPA

1.5.3.87 The Step 1 integrity test for the Rum SPA is presented below for the Morgan Generation Assets alone (Table 1.28). The assessment considers the Manx shearwater feature of the SPA in relation to disturbance and displacement from airborne sound and presence of vessels and infrastructure. The population at the SPA for Manx shearwater was sourced from Burnell *et al.* (2023).

Table 1.28: Step 1 integrity test for the Rum SPA from the Morgan Generation Assets acting alone.

Qualifying feature	Seasonal apportioning values				Total predicted impact (birds/annum)	SPA population (breeding adults)	% increase in baseline mortality	Conclusion
	Breeding	Post-breeding	Non-breeding	Pre-breeding				
Manx shearwater	0.088	0.152	N/A	0.152	1.2	577,788	<0.01	No potential for AEOI

1.5.3.88 The predicted impact of the Morgan Generation Assets alone on the Manx shearwater feature of the Rum SPA represents less than a 0.05% increase in baseline mortality of the SPA population. There is therefore considered to be no adverse effect on the site integrity of the Rum SPA as a result of potential impacts on Manx shearwater from the Morgan Generation Assets.

1.5.3.89 No in-combination assessment has been undertaken for Manx shearwater as the potential impact from the Morgan Generation Assets alone is predicted to be less than a 0.05% increase in baseline mortality. Therefore, it is considered that the Morgan Generation Assets will not make a measurable contribution to the existing in-combination impact. It can be concluded beyond reasonable scientific doubt that there is no risk of an AEOI on the Rum SPA as a result of disturbance and displacement from airborne sound and presence of vessels and infrastructure with respect to operations and maintenance of the Morgan Generation Assets alone and in-combination with other plans and projects. The Rum SPA has not been taken through to the integrity test: Step 2 and therefore potential impacts on the Manx shearwater feature of the Rum SPA have not been considered further.

Mingulay and Berneray SPA

1.5.3.90 The Step 1 integrity test for the Mingulay and Berneray SPA is presented below for the Morgan Generation Assets alone (Table 1.29). The assessment considers the guillemot and razorbill features of the SPA in relation to disturbance and displacement from airborne sound and presence of vessels and infrastructure. The population at the SPA for both features was sourced from Burnell *et al.* (2023).

Table 1.29: Step 1 integrity test for the Mingulay and Berneray SPA from the Morgan Generation Assets acting alone.

Qualifying feature	Seasonal apportioning values				Total predicted impact (birds/annum)	SPA population (breeding adults)	% increase in baseline mortality	Conclusion
	Breeding	Post-breeding	Non-breeding	Pre-breeding				
Guillemot	No connectivity	N/A	0.023	N/A	0.4	50,639	0.01	No potential for AEOI
Razorbill	No connectivity	0.033	0.024	0.033	0.2	26,787	0.01	No potential for AEOI

1.5.3.91 The predicted impact of the Morgan Generation Assets alone on the guillemot and razorbill features of the Mingulay and Berneray SPA represents less than a 0.05% increase in baseline mortality of the relevant SPA populations. The potential impact magnitude for both species is also lower than 0.5 birds/annum, noting that there is considerable precaution in the assessment. There is therefore considered to be no adverse effect on the site integrity of the Mingulay and Berneray SPA as a result of potential impacts on guillemot and razorbill from the Morgan Generation Assets.

1.5.3.92 No in-combination assessment has been undertaken for guillemot or razorbill as the potential impact from the Morgan Generation Assets alone is predicted to be less than a 0.05% increase in baseline mortality. Therefore, it is considered that the Morgan Generation Assets will not make a measurable contribution to the existing in-combination impact. It can be concluded beyond reasonable scientific doubt that there is no risk of an AEOI on the Mingulay and Berneray SPA as a result of disturbance and displacement from airborne sound and presence of vessels and infrastructure with respect to operations and maintenance of the Morgan Generation Assets alone and in-combination with other plans and projects. The Mingulay and Berneray SPA has not been taken through to the integrity test: Step 2 and therefore potential impacts on the guillemot and razorbill features of the Mingulay and Berneray SPA have not been considered further.

Buchan Ness to Collieston Coast SPA

1.5.3.93 The Step 1 integrity test for the Buchan Ness to Collieston Coast SPA is presented below for the Morgan Generation Assets alone (Table 1.30). The assessment considers the kittiwake feature of the SPA in relation to potential disturbance and displacement from airborne sound and presence of vessels and infrastructure and collision risk impacts. The population at the SPA is from 2023 was sourced from the SMP database (JNCC, 2023).

Table 1.30: Step 1 integrity test for the Buchan Ness to Collieston Coast SPA from the Morgan Generation Assets acting alone.

Qualifying feature	Seasonal apportioning values			Total predicted impact (birds/annum)	SPA population (breeding adults)	% increase in baseline mortality	Conclusion
	Breeding	Post-breeding	Pre-breeding				
Kittiwake	No connectivity	0.006	0.011	0.1 to 0.3	22,590	<0.01 to 0.01	No potential for AEOI

1.5.3.94 The predicted impact of the Morgan Generation Assets alone on the kittiwake feature of the Buchan Ness to Collieston Coast SPA represents less than a 0.05% increase in baseline mortality of the population at the SPA. The potential impact magnitude for kittiwake is also lower than 0.5 birds/annum, noting that there is considerable precaution in the assessment. There is therefore considered to be no adverse effect on the site integrity of the Buchan Ness to Collieston Coast SPA as a result of potential impacts on kittiwake from the Morgan Generation Assets.

1.5.3.95 No in-combination assessment has been undertaken for kittiwake as the potential impact from the Morgan Generation Assets alone is predicted to be less than a 0.05% increase in baseline mortality. Therefore, it is considered that the Morgan Generation Assets will not make a measurable contribution to the existing in-combination impact. It can be concluded beyond reasonable scientific doubt that there is no risk of an AEOI on the Buchan Ness to Collieston Coast SPA as a result of disturbance and displacement from airborne sound and presence of vessels and infrastructure and/or collision risk with respect to operations and maintenance of the Morgan Generation Assets alone and in-combination with other plans and projects. The Buchan Ness to Collieston Coast SPA has not been taken through to the integrity test: Step 2 and therefore potential impacts on the kittiwake feature of the Buchan Ness to Collieston Coast SPA have not been considered further.

Troup, Pennan and Lion's Heads SPA

1.5.3.96 The Step 1 integrity test for the Troup, Pennan and Lion's Heads SPA is presented below for the Morgan Generation Assets alone (Table 1.31). The assessment considers the kittiwake feature of the SPA in relation to potential disturbance and displacement from airborne sound and presence of vessels and infrastructure and collision risk impacts. The population at the SPA is from 2023 and was sourced from the SMP database (JNCC, 2023).

Table 1.31: Step 1 integrity test for the Troup, Pennan and Lion's Heads SPA from the Morgan Generation Assets acting alone.

Qualifying feature	Seasonal apportioning values			Total predicted impact (birds/annum)	SPA population (breeding adults)		% increase in baseline mortality		Conclusion
	Breeding	Post-breeding	Pre-breeding						
Kittiwake	No connectivity	0.007	0.013	0.2 to 0.4		21,232		0.01 to 0.01	No potential for AEOI

1.5.3.97 The predicted impact of the Morgan Generation Assets alone on the kittiwake feature of the Troup, Pennan and Lion's Heads SPA represents less than a 0.05% increase in baseline mortality of the population at the SPA. The potential impact magnitude for kittiwake is also lower than 0.5 birds/annum, noting that there is considerable precaution in the assessment. There is therefore considered to be no adverse effect on the site integrity of the Troup, Pennan and Lion's Heads SPA as a result of potential impacts on kittiwake from the Morgan Generation Assets.

1.5.3.98 No in-combination assessment has been undertaken for kittiwake as the potential impact from the Morgan Generation Assets alone is predicted to be less than a 0.05% increase in baseline mortality. Therefore, it is considered that the Morgan Generation Assets will not make a measurable contribution to the existing in-combination impact. It can be concluded beyond reasonable scientific doubt that there is no risk of an AEOI on the Troup, Pennan and Lion's Heads SPA as a result of disturbance and displacement from airborne sound and presence of vessels and infrastructure and/or collision risk with respect to operations and maintenance of the Morgan Generation Assets alone and in-combination with other plans and projects. The Troup, Pennan and Lion's Heads SPA has not been taken through to the integrity test: Step 2 and therefore potential impacts on the kittiwake feature of the Troup, Pennan and Lion's Heads SPA have not been considered further.

The Shiant Isles SPA

1.5.3.99 The Step 1 integrity test for The Shiant Isles SPA is presented below for the Morgan Generation Assets alone (Table 1.32). The assessment considers the razorbill feature of the SPA in relation to disturbance and displacement from airborne sound and presence of vessels and infrastructure. The population at the SPA for razorbill was sourced from Burnell *et al.* (2023).

Table 1.32: Step 1 integrity test for The Shiant Isles SPA from the Morgan Generation Assets acting alone.

Qualifying feature	Seasonal apportioning values				Total predicted impact (birds/annum)	SPA population (breeding adults)	% increase in baseline mortality	Conclusion
	Breeding	Post-breeding	Non-breeding	Pre-breeding				
Razorbill	No connectivity	0.014	0.010	0.014	0.1	10,759	0.01	No potential for AEOI

1.5.3.100 The predicted impact of the Morgan Generation Assets alone on the razorbill feature of The Shiant Isles SPA represents less than a 0.05% increase in baseline mortality of the SPA population. The potential impact magnitude for razorbill is also lower than 0.5 birds/annum, noting that there is considerable precaution in the assessment. There is therefore considered to be no adverse effect on the site integrity of The Shiant Isles SPA as a result of potential impacts on razorbill from the Morgan Generation Assets.

1.5.3.101 No in-combination assessment has been undertaken for razorbill as the potential impact from the Morgan Generation Assets alone is predicted to be less than a 0.05% increase in baseline mortality. Therefore, it is considered that the Morgan Generation Assets will not make a measurable contribution to the existing in-combination impact. It can be concluded beyond reasonable scientific doubt that there is no risk of an AEOI on the Shiant Isles SPA as a result of disturbance and displacement from airborne sound and presence of vessels and infrastructure with respect to operations and maintenance of the Morgan Generation Assets alone and in-combination with other plans and projects. The Shiant Isles SPA has not been taken through to the integrity test: Step 2 and therefore potential impacts on the razorbill feature of The Shiant Isles SPA have not been considered further.

East Caithness Cliffs SPA

1.5.3.102 The Step 1 integrity test for the East Caithness Cliffs SPA is presented below for the Morgan Generation Assets alone (Table 1.33). The assessment considers the kittiwake feature of the SPA in relation to potential disturbance and displacement from airborne sound and presence of vessels and infrastructure and collision risk impacts. The population at the SPA was sourced from Burnell *et al.* (2023).

Table 1.33: Step 1 integrity test for the East Caithness Cliffs SPA from the Morgan Generation Assets acting alone.

Qualifying feature	Seasonal apportioning values			Total predicted impact (birds/annum)	SPA population (breeding adults)	% increase in baseline mortality	Conclusion
	Breeding	Post-breeding	Pre-breeding				
Kittiwake	No connectivity	0.018	0.035	0.4 to 1.0	48,958	0.01 to 0.01	No potential for AEOI

1.5.3.103 The predicted impact of the Morgan Generation Assets alone on the kittiwake feature of the East Caithness Cliffs SPA represents less than a 0.05% increase in baseline mortality of the SPA population. The potential impact magnitude for kittiwake is also lower than 0.5 birds/annum, noting that there is considerable precaution in the assessment. There is therefore considered to be no adverse effect on the site integrity of the East Caithness Cliffs SPA as a result of potential impacts on kittiwake from the Morgan Generation Assets.

1.5.3.104 No in-combination assessment has been undertaken for kittiwake as the potential impact from the Morgan Generation Assets alone is predicted to be less than a 0.05% increase in baseline mortality. Therefore, it is considered that the Morgan Generation Assets will not make a measurable contribution to the existing in-combination impact. It can be concluded beyond reasonable scientific doubt that there is no risk of an AEOI on the East Caithness Cliffs SPA as a result of disturbance and displacement from airborne sound and presence of vessels and infrastructure and/or collision risk with respect to operations and maintenance of the Morgan Generation Assets alone and in-combination with other plans and projects. The East Caithness Cliffs SPA has not been taken through to the integrity test: Step 2 and therefore potential impacts on the kittiwake feature of the East Caithness Cliffs SPA have not been considered further.

Isles of Scilly SPA / Isles of Scilly Ramsar

1.5.3.105 The Step 1 integrity test for the Isles of Scilly SPA / Isles of Scilly Ramsar is presented below for the Morgan Generation Assets alone (Table 1.34). The assessment considers the Manx shearwater feature of the SPA in relation to disturbance and displacement from airborne sound and presence of vessels and infrastructure and the lesser black-backed gull and great black-backed gull features of the SPA in relation to potential collision risk impacts. The population at the SPA for lesser black-backed gull and great black-backed gull was sourced from Burnell *et al.* (2023). The population at the SPA for Manx shearwater is from 2023 and was sourced from the SMP database (JNCC, 2023).

Table 1.34: Step 1 integrity test for the Isles of Scilly SPA / Isles of Scilly Ramsar from the Morgan Generation Assets acting alone.

Qualifying feature	Seasonal apportioning values				Total predicted impact (birds/annum)	SPA population (breeding adults)	% increase in baseline mortality	Conclusion
	Breeding	Post-breeding	Non-breeding	Pre-breeding				
Lesser black-backed gull	No connectivity	0.083	0.094	0.083	<0.1 to <0.1	4,870	<0.01 to 0.01	No potential for AEOI
Great black-backed gull (SPA only)	No connectivity	N/A	0.091	N/A	0.1 to 0.4	1,618	0.05 to 0.37	No potential for AEOI from the Morgan Generation Assets alone
Manx shearwater (SPA only)	<0.001	0.001	N/A	0.001	<0.1	1,136	<0.01	No potential for AEOI

1.5.3.106 The predicted impact of the Morgan Generation Assets alone on the lesser black-backed gull and Manx shearwater features of the Isles of Scilly SPA / Isles of Scilly Ramsar represents less than a 0.05% increase in baseline mortality of the relevant populations at the SPA. The potential impact magnitude for lesser black-backed gull and Manx shearwater is also lower than 0.5 birds/annum, noting that there is considerable precaution in the assessment. There is therefore considered to be no adverse effect on the site integrity of the Isles of Scilly SPA / Isles of Scilly Ramsar as a result of potential impacts on lesser black-backed gull and Manx shearwater from the Morgan Generation Assets.

1.5.3.107 No in-combination assessment has been undertaken for lesser black-backed gull and Manx shearwater as the potential impact from the Morgan Generation Assets alone is predicted to be less than a 0.05% increase in baseline mortality. Therefore, it is considered

that the Morgan Generation Assets will not make a measurable contribution to the existing in-combination impact. It can be concluded beyond reasonable scientific doubt that there is no risk of an AEOI on the Isles of Scilly SPA / Isles of Scilly Ramsar as a result of disturbance and displacement from airborne sound and presence of vessels and infrastructure and collision risk for relevant features with respect to operations and maintenance of the Morgan Generation Assets alone and in-combination with other plans and projects. The Isles of Scilly SPA / Isles of Scilly Ramsar has not been taken through to the integrity test: Step 2 and therefore potential impacts on the lesser black-backed gull and Manx shearwater features of the Isles of Scilly SPA / Isles of Scilly Ramsar have not been considered further.

1.5.3.108 The predicted impact of the Morgan Generation Assets alone on the great black-backed gull feature of the Isles of Scilly SPA represents more than a 0.05% increase in baseline mortality. However, the potential impact magnitude for great black-backed gull is lower than 0.5 birds/annum, noting that there is considerable precaution in the assessment. As the potential impact represents more than a 0.05% increase in baseline mortality consideration is given to the existing in-combination impact (Table 1.35).

Table 1.35: Step 1 integrity test for the great black-backed gull of the Isles of Scilly SPA from the Morgan Generation Assets acting in combination with other projects/plans in relation to potential collision risk impacts.

Project	Seasonal apportioning values		Seasonal apportioned collision values	
	Breeding	Non-breeding	Breeding	Non-breeding
Awel y Môr	No connectivity	0.091	-	0.1
Erebus	No connectivity	0.091	-	0.1
Mona Offshore Wind Project	No connectivity	0.091	-	0.3
Morecambe Offshore Wind Farm: Generation Assets	No connectivity	0.091	-	0.0
Morgan Generation Assets	No connectivity	0.091	-	0.4
Ormonde	No connectivity	0.091	-	0.0
Rampion	No connectivity	0.091	-	2.4
Rampion 2	No connectivity	0.091	-	1.3
Twinhub	0.104	0.091	0.7	0.8
Walney 3 + 4	No connectivity	0.091	-	2.7

Project	Seasonal apportioning values		Seasonal apportioned collision values	
	Breeding	Non-breeding	Breeding	Non-breeding
White Cross	No connectivity	0.091	-	0.0
Annual total			8.8	

1.5.3.109 The total potential in-combination impact, utilising precautionary parameter assumptions, is 8.8 birds/annum. This represents a 7.8% increase in the baseline mortality of the great black-backed gull population of the Isles of Scilly SPA. This SPA is therefore progressed to Step 2 of the ISAA.

Seas off St Kilda SPA

1.5.3.110 The potential for LSE was identified for the guillemot, fulmar and gannet features of the Seas off St Kilda SPA. The conclusions reached in relation to all features of the St Kilda SPA are considered applicable to the Seas off St Kilda SPA as the Seas off St Kilda SPA is designated to protect the features of the St Kilda SPA as they utilise the seas areas included within the designation of the Seas off St Kilda SPA. There is therefore considered to be no potential for AEOI as a result of potential impacts associated with the Morgan Generation Assets for the guillemot, fulmar and gannet features of the Seas off St Kilda SPA.

1.5.3.111 No in-combination assessment has been undertaken for guillemot, fulmar and gannet at the St Kilda SPA as the potential impact from the Morgan Generation Assets alone is predicted to be less than a 0.05% increase in baseline mortality. Therefore, it is considered that the Morgan Generation Assets will not make a measurable contribution to the existing in-combination impact at the St Kilda SPA and the Seas off St Kilda SPA. It can therefore be concluded beyond reasonable scientific doubt that there is no risk of an AEOI on the Seas off St Kilda SPA as a result of disturbance and displacement from airborne sound and presence of vessels and infrastructure and/or collision risk with respect to operations and maintenance of the Morgan Generation Assets alone and in-combination with other plans and projects. The Seas off St Kilda SPA has not been taken through to the integrity test: Step 2 and therefore potential impacts on the guillemot, fulmar and gannet features of the Seas off St Kilda SPA have not been considered further.

Handa SPA

1.5.3.112 The Step 1 integrity test for the Handa SPA is presented below for the Morgan Generation Assets alone (Table 1.36). The assessment considers the guillemot and razorbill features of the SPA in relation to disturbance and displacement from airborne sound and presence of vessels and infrastructure. The population at the SPA for razorbill was sourced from Burnell *et al.* (2023). The population at the SPA for guillemot was sourced from JNCC (2023).

Table 1.36: Step 1 integrity test for the Handa SPA from the Morgan Generation Assets acting alone.

Qualifying feature	Seasonal apportioning values				Total predicted impact (birds/annum)	SPA population (breeding adults)	% increase in baseline mortality	Conclusion
	Breeding	Post-breeding	Non-breeding	Pre-breeding				
Guillemot	No connectivity	N/A	0.063	N/A	1.2	77,179	0.03	No potential for AEOI
Razorbill	No connectivity	0.017	0.012	0.017	0.1	10,997	0.01	No potential for AEOI

1.5.3.113 The predicted impact of the Morgan Generation Assets alone on the guillemot and razorbill features of the Handa SPA represents less than a 0.05% increase in baseline mortality of the SPA population. The potential impact magnitude for razorbill is also lower than 0.5 birds/annum, noting that there is considerable precaution in the assessment. There is therefore considered to be no AEOI of the Handa SPA as a result of potential impacts on guillemot and razorbill from the Morgan Generation Assets.

1.5.3.114 No in-combination assessment has been undertaken for guillemot or razorbill as the potential impact from the Morgan Generation Assets alone is predicted to be less than a 0.05% increase in baseline mortality. Therefore, it is considered that the Morgan Generation Assets will not make a measurable contribution to the existing in-combination impact. It can be concluded beyond reasonable scientific doubt that there is no risk of an AEOI on the Handa SPA as a result of disturbance and displacement from airborne sound and presence of vessels and infrastructure with respect to operations and maintenance of the Morgan Generation Assets alone and in-combination with other plans and projects. The Handa SPA has not been taken through to the integrity test: Step 2 and therefore potential impacts on the guillemot and razorbill feature of the Handa SPA have not been considered further.

St Kilda SPA

1.5.3.115 The Step 1 integrity test for the St Kilda SPA is presented below for the Morgan Generation Assets alone (Table 1.37). The assessment considers the gannet feature of the SPA in relation to potential disturbance and displacement from airborne sound and presence of vessels and infrastructure and collision risk impacts. The assessment also considers the guillemot, Manx shearwater and fulmar features of the SPA in relation to disturbance and displacement from airborne sound and presence of vessels and infrastructure. The population at the SPA for fulmar and gannet was sourced from Burnell *et al.* (2023). The population at the SPA for guillemot is from 2023 and for Manx shearwater is from 1999 was sourced from the SMP database (JNCC, 2023).

Table 1.37: Step 1 integrity test for the St Kilda SPA from the Morgan Generation Assets acting alone.

Qualifying feature	Seasonal apportioning values				Total predicted impact (birds/annum)	SPA population (breeding adults)	% increase in baseline mortality	Conclusion
	Breeding	Post-breeding	Non-breeding	Pre-breeding				
Guillemot	No connectivity	N/A	0.026	N/A	0.5	20,383	0.04	No potential for AEOI
Fulmar	0.010	0.152	0.158	0.152	<0.1 to 0.2	58,372	<0.01 to 0.01	No potential for AEOI
Manx shearwater	0.002	0.006	N/A	0.006	<0.1	7,462	0.01	No potential for AEOI
Gannet	No connectivity	0.197	N/A	0.180	0.2 to 0.2	120,580	<0.01 to <0.01	No potential for AEOI

1.5.3.116 The predicted impact of the Morgan Generation Assets alone on the guillemot, fulmar, Manx shearwater and gannet features of the St Kilda SPA represents less than a 0.05% increase in baseline mortality of the SPA population. The potential impact magnitude for fulmar, Manx shearwater and gannet is also lower than 0.5 birds/annum, noting that there is considerable precaution in the assessment. There is therefore considered to be no adverse effect on the site integrity of the St Kilda SPA as a result of potential impacts on guillemot, fulmar, Manx shearwater and gannet from the Morgan Generation Assets.

1.5.3.117 No in-combination assessment has been undertaken for guillemot, fulmar, Manx shearwater and gannet as the potential impact from the Morgan Generation Assets alone is predicted to be less than a 0.05% increase in baseline mortality. Therefore, it is considered that the Morgan Generation Assets will not make a measurable contribution to the existing in-combination impact. It can be concluded

beyond reasonable scientific doubt that there is no risk of an AEOI on the St Kilda SPA as a result of disturbance and displacement from airborne sound and presence of vessels and infrastructure and collision risk for relevant features with respect to operations and maintenance of the Morgan Generation Assets alone and in-combination with other plans and projects. The St Kilda SPA has not been taken through to the integrity test: Step 2 and therefore potential impacts on the guillemot, fulmar, Manx shearwater and gannet features of the St Kilda SPA have not been considered further.

Cape Wrath SPA

1.5.3.118 The Step 1 integrity test for the Cape Wrath SPA is presented below for the Morgan Generation Assets alone (Table 1.38). The assessment considers the kittiwake feature of the SPA in relation to potential disturbance and displacement from airborne sound and presence of vessels and infrastructure and collision risk impacts. The assessment also considers the guillemot feature of the SPA in relation to disturbance and displacement from airborne sound and presence of vessels and infrastructure. The population at the SPA for all features was sourced from Burnell *et al.* (2023).

Table 1.38: Step 1 integrity test for the Cape Wrath SPA from the Morgan Generation Assets acting alone.

Qualifying feature	Seasonal apportioning values				Total predicted impact (birds/annum)	SPA population (breeding adults)	% increase in baseline mortality	Conclusion
	Breeding	Post-breeding	Non-breeding	Pre-breeding				
Kittiwake	No connectivity	0.014	N/A	0.024	0.3 to 0.7	7,244	0.03 to 0.07	No potential for AEOI
Guillemot	No connectivity	N/A	0.046	N/A	0.9	51,066	0.03	No potential for AEOI from the Morgan Generation Assets alone

1.5.3.119 The predicted impact of the Morgan Generation Assets alone on the guillemot feature of the Cape Wrath SPA represents less than a 0.05% increase in the baseline mortality of the SPA population. The potential impact magnitude for guillemot is also below one bird/annum, noting that there is considerable precaution in the assessment. There is therefore considered to be no adverse effect on the site integrity of the Cape Wrath SPA as a result of potential impacts on guillemot from the Morgan Generation Assets.

1.5.3.120 No in-combination assessment has been undertaken for guillemot as the potential impact from the Morgan Generation Assets alone is predicted to be less than a 0.05% increase in baseline mortality. Therefore, it is considered that the Morgan Generation Assets will not make a measurable contribution to the existing in-combination impact. It can be concluded beyond reasonable scientific doubt that there is no risk of an AEOI on the Cape Wrath SPA as a result of disturbance and displacement from airborne sound and presence of vessels and infrastructure for guillemot with respect to operations and maintenance of the Morgan Generation Assets alone and in-combination with other plans and projects. The Cape Wrath SPA has not been taken through to the integrity test: Step 2 and therefore potential impacts on the guillemot feature of the Cape Wrath SPA have not been considered further.

1.5.3.121 The predicted impact of the Morgan Generation Assets alone on the kittiwake feature of the Cape Wrath SPA represents more than a 0.05% increase in baseline mortality of the SPA population. However, the potential impact magnitude for kittiwake is below one bird/annum, noting that there is considerable precaution in the assessment. As the potential impact represents more than a 0.05% increase in baseline mortality consideration is given to the existing in-combination impact (Table 1.39).

Table 1.39: Step 1 integrity test for the kittiwake feature of the Cape Wrath SPA from the Morgan Generation Assets acting in combination with other projects/plans in relation to potential disturbance and displacement from airborne noise, underwater sound, and presence of vessels and infrastructure and collision risk impacts.

a – apportioning value unavailable, assumed to be the same as the Morgan Generation Assets

b – apportioning value unavailable, assumed to be the same as Erebus offshore wind farm

Project	Seasonal apportioning values			Seasonal abundance values			Seasonal apportioned collision impacts		
	Breeding	Post-breeding	Pre-breeding	Breeding	Post-breeding	Pre-breeding	Breeding	Post-breeding	Pre-breeding
Awel y Môr	No connectivity	0.014	0.024	-	2.5	10.1	-	0.1	0.3
Burbo Bank Extension	No connectivity	0.014	0.024	-	3.8	3.3	-	0.0	0.0
Erebus	No connectivity	0.014	0.024	-	27.5	12.2	-	0.3	0.3
Mona Offshore Wind Project	No connectivity	0.014	0.024	-	7.6	21.2	-	0.0	0.1
Morecambe Offshore Wind Farm: Generation Assets	No connectivity	0.014	0.024	-	35.0	13.6	-	0.2	0.1
Morgan Generation Assets	No connectivity	0.014	0.024	-	15.7	18.9	-	0.3	0.3
Ormonde	No connectivity	0.014	0.024	-	Unavailable		-	0.0	0.0
Rampion	No connectivity	0.014	0.024	-	5.8	9.0	-	0.2	0.4
Rampion 2	No connectivity	0.014	0.024	-	1.3	6.8	-	0.1	0.4
Robin Rigg	No connectivity	0.014	0.024	-			Unavailable	-	Unavailable
Twinhub	No connectivity	0.014	0.024	Unavailable			-	0.0	0.1

Project	Seasonal apportioning values			Seasonal abundance values			Seasonal apportioned collision impacts		
	Breeding	Post-breeding	Pre-breeding	Breeding	Post-breeding	Pre-breeding	Breeding	Post-breeding	Pre-breeding
Walney 3 + 4	No connectivity	0.014	0.024	-	8.8	8.0	-	0.8	1.1
West of Duddon Sands	No connectivity	0.014	0.024	Unavailable	Unavailable				
West of Orkney	0.229	0.014	0.024	157.7	Unavailable	29.1	4.5	0.2	0.5
White Cross	No connectivity	0.014	0.024	-	1.1	10.3	-	0.0	0.3
Annual total				410.9			10.8		

1.5.3.122 The in-combination collision risk impact is 10.8 collisions/annum. This represents a 1.02% increase in the baseline mortality of population at the SPA. On a precautionary basis the kittiwake feature of the Cape Wrath SPA is therefore progressed to the Integrity test: Step 2 in relation to potential collision risk impacts.

1.5.3.123 The potential in-combination displacement impact (assuming a 50% displacement rate and 1% mortality rate) is 2.1 birds/annum. This represents a 0.19% increase in the baseline mortality of the population at the SPA. Displacement impacts on the kittiwake feature of the Cape Wrath SPA are therefore not progressed to the Integrity test: Step 2 as an individual impact.

1.5.3.124 The combined in-combination impact (assuming a 50% displacement rate and 1% mortality rate) is 14.4 birds/annum. This represents a 1.22% increase in the baseline mortality of the population at the SPA. On a precautionary basis the kittiwake feature of the Cape Wrath SPA is therefore progressed to the Integrity test: Step 2 in relation to the combined impact of displacement and collision.

Flannan Isles SPA

1.5.3.125 The Step 1 integrity test for the Flannan Isles SPA is presented below for the Morgan Generation Assets alone (Table 1.40). The assessment considers the guillemot feature of the SPA in relation to disturbance and displacement from airborne sound and presence of vessels and infrastructure. The population at the SPA was sourced from Burnell *et al.* (2023).

Table 1.40: Step 1 integrity test for the Flannan Isles SPA from the Morgan Generation Assets acting alone.

Qualifying feature	Seasonal apportioning values		Total predicted impact (birds/annum)	SPA population (breeding adults)	% increase in baseline mortality	Conclusion
	Breeding	Non-breeding				
Guillemot	No connectivity	0.016	0.3	7,547	0.07	No potential for AEOI from the Morgan Generation Assets alone

1.5.3.126 The predicted impact of the Morgan Generation Assets alone on the guillemot feature of the Flannan Isles SPA represents more than a 0.05% increase in baseline mortality for the population at the SPA. However, the potential impact magnitude for guillemot is below one bird/annum, noting that there is considerable precaution in the assessment. As the potential impact represents more than a 0.05% increase in baseline mortality consideration is given to the existing in-combination impact (Table 1.41).

Table 1.41: Step 1 integrity test for the guillemot feature of the Flannan Isles SPA from the Morgan Generation Assets acting in combination with other projects/plans in relation to potential disturbance and displacement from airborne noise, underwater sound, and presence of vessels and infrastructure impacts.

Project	Seasonal apportioning values		Seasonal abundance values	
	Breeding	Non-breeding	Breeding	Non-breeding
Awel y Môr	No connectivity	0.016	-	47.7
Burbo Bank Extension	No connectivity	0.016	-	25.5
Erebus	No connectivity	0.016	-	463.5
Mona Offshore Wind Project	No connectivity	0.016	-	61.4
Morecambe Offshore Wind Farm: Generation Assets	No connectivity	0.016	-	125.1
Morgan Generation Assets	No connectivity	0.016	-	62.5
Ormonde	No connectivity	0.016	-	Unavailable
Robin Rigg	No connectivity	0.016	-	Unavailable
Twinhub	No connectivity	0.016	-	3.6
Walney 3 + 4	No connectivity	0.016	-	31.5
West of Duddon Sands	No connectivity	0.016	-	Unavailable
West of Orkney	No connectivity	0.016	-	71.9
White Cross	No connectivity	0.016	-	17.3
Annual total			910.1	

1.5.3.127 In addition to those projects considered in-combination in Table 1.41, consideration is also given to underwater collision impacts associated with the Morlais tidal project. The predicted impact associated with this project apportioned to the Flannan Isles SPA is 0.2 birds/annum.

1.5.3.128 The total potential in-combination impact (applying a 50% displacement rate and 1% mortality rate) is 4.6 birds/annum. When the impact from the Morlais project is added this increases to 4.8 birds/annum. This represents a 1.03% increase in the baseline mortality of the guillemot population of the Flannan Isles SPA. This SPA is therefore progressed to Step 2 of the ISAA.

Sule Skerry and Sule Stack SPA

1.5.3.129 The Step 1 integrity test for the Sule Skerry and Sule Stack SPA is presented below for the Morgan Generation Assets alone (Table 1.42). The assessment considers the gannet feature of the SPA in relation to potential disturbance and displacement from airborne sound and presence of vessels and infrastructure and collision risk impacts and the guillemot feature of the SPA in relation to potential disturbance and displacement from airborne sound and presence of vessels and infrastructure. The population at the SPA for both features was sourced from Burnell *et al.* (2023).

Table 1.42: Step 1 integrity test for the Sule Skerry and Sule Stack SPA from the Morgan Generation Assets acting alone.

Qualifying feature	Seasonal apportioning values				Total predicted impact (birds/annum)	SPA population (breeding adults)	% increase in baseline mortality	Conclusion
	Breeding	Post-breeding	Non-breeding	Pre-breeding				
Guillemot	No connectivity	N/A	0.013	N/A	0.2	12,060	0.03	No potential for AEOI
Gannet	No connectivity	0.015	N/A	0.014	<0.1 to <0.1	18,130	<0.01 to <0.01	No potential for AEOI

1.5.3.130 The predicted impact of the Morgan Generation Assets alone on the guillemot and gannet features of the Sule Skerry and Sule Stack SPA represents less than a 0.05% increase in baseline mortality of the SPA population. The potential impact magnitude for gannet is also lower than 0.5 birds/annum, noting that there is considerable precaution in the assessment. There is therefore considered to be no adverse effect on the site integrity of the Sule Skerry and Sule Stack SPA as a result of potential impacts on guillemot and gannet from the Morgan Generation Assets.

1.5.3.131 No in-combination assessment has been undertaken for guillemot or gannet as the potential impact from the Morgan Generation Assets alone is predicted to be less than a 0.05% increase in baseline mortality. Therefore, it is considered that the Morgan Generation Assets will not make a measurable contribution to the existing in-combination impact. It can be concluded beyond reasonable scientific doubt that there is no risk of an AEOI on the Sule Skerry and Sule Stack SPA as a result of disturbance and displacement from airborne sound and presence of vessels and infrastructure and/or collision risk with respect to operations and maintenance of the Morgan Generation Assets alone and in-combination with other plans and projects. The Sule Skerry and Sule Stack SPA has not been taken through to the integrity test: Step 2 and therefore potential impacts on the guillemot and gannet feature of the Sule Skerry and Sule Stack SPA have not been considered further.

North Rona and Sula Sgeir SPA

1.5.3.132 The Step 1 integrity test for the North Rona and Sula Sgeir SPA is presented below for the Morgan Generation Assets alone (Table 1.43). The assessment considers the gannet feature of the SPA in relation to potential disturbance and displacement from airborne sound and presence of vessels and infrastructure and collision risk impacts. The population at the SPA is from 2023 was sourced from the SMP database (JNCC, 2023).

Table 1.43: Step 1 integrity test for the North Rona and Sula Sgeir SPA from the Morgan Generation Assets acting alone.

Qualifying feature	Seasonal apportioning values			Total predicted impact (birds/annum)	SPA population (breeding adults)	% increase in baseline mortality	Conclusion
	Breeding	Post-breeding	Pre-breeding				
Gannet	No connectivity	0.030	0.028	<0.1 to <0.1	24,542	<0.01 to <0.01	No potential for AEOI

1.5.3.133 The predicted impact of the Morgan Generation Assets alone on the gannet feature of the North Rona and Sula Sgeir SPA represents less than a 0.05% increase in baseline mortality of the SPA population. The potential impact magnitude for gannet is also lower than 0.5 birds/annum, noting that there is considerable precaution in the assessment. There is therefore considered to be no adverse effect on the site integrity of the North Rona and Sula Sgeir SPA as a result of potential impacts on gannet from the Morgan Generation Assets.

1.5.3.134 No in-combination assessment has been undertaken for gannet as the potential impact from the Morgan Generation Assets alone is predicted to be less than a 0.05% increase in baseline mortality. Therefore, it is considered that the Morgan Generation Assets will not make a measurable contribution to the existing in-combination impact. It can be concluded beyond reasonable scientific doubt that there is no risk of an AEOI on the North Rona and Sula Sgeir SPA as a result of disturbance and displacement from airborne sound and presence of vessels and infrastructure and/or collision risk with respect to operations and maintenance of the Morgan Generation Assets alone and in-combination with other plans and projects. The North Rona and Sula Sgeir SPA has not been taken through to the integrity test: Step 2 and therefore potential impacts on the gannet feature of the North Rona and Sula Sgeir SPA have not been considered further.

West Westray SPA

1.5.3.135 The Step 1 integrity test for the West Westray SPA is presented below for the Morgan Generation Assets alone (Table 1.44). The assessment considers the kittiwake feature of the SPA in relation to potential disturbance and displacement from airborne sound and presence of vessels and infrastructure and collision risk impacts. The population at the SPA was sourced from Burnell *et al.* (2023).

Table 1.44: Step 1 integrity test for the West Westray SPA from the Morgan Generation Assets acting alone.

Qualifying feature	Seasonal apportioning values			Total predicted impact (birds/annum)	SPA population (breeding adults)	% increase in baseline mortality	Conclusion
	Breeding	Post-breeding	Pre-breeding				
Kittiwake	No connectivity	0.005	0.010	0.1 to 0.3	5,510	0.02 to 0.04	No potential for AEOI

1.5.3.136 The predicted impact of the Morgan Generation Assets alone on the kittiwake feature of the West Westray SPA represents less than a 0.05% increase in baseline mortality of the SPA population. The potential impact magnitude for kittiwake is also lower than 0.5 birds/annum, noting that there is considerable precaution in the assessment. There is therefore considered to be no adverse effect on the site integrity of the West Westray SPA as a result of potential impacts on kittiwake from the Morgan Generation Assets.

1.5.3.137 No in-combination assessment has been undertaken for kittiwake as the potential impact from the Morgan Generation Assets alone is predicted to be less than a 0.05% increase in baseline mortality. Therefore, it is considered that the Morgan Generation Assets will not make a measurable contribution to the existing in-combination impact. It can be concluded beyond reasonable scientific doubt that there is no risk of an AEOI on the West Westray SPA as a result of disturbance and displacement from airborne sound and presence of vessels and infrastructure and/or collision risk with respect to operations and maintenance of the Morgan Generation Assets alone and in-combination with other plans and projects. The West Westray SPA has not been taken through to the integrity test: Step 2 and therefore potential impacts on the kittiwake feature of the West Westray SPA have not been considered further.

Hermaness, Saxa Vord and Valla Field SPA

1.5.3.138 The Step 1 integrity test for the Hermaness, Saxa Vord and Valla Field SPA is presented below for the Morgan Generation Assets alone (Table 1.45). The assessment considers the gannet feature of the SPA in relation to potential disturbance and displacement from airborne sound and presence of vessels and infrastructure and collision risk impacts. The population at the SPA was sourced from Burnell *et al.* (2023).

Table 1.45: Step 1 integrity test for the Hermaness, Saxa Vord and Valla Field SPA from the Morgan Generation Assets acting alone.

Qualifying feature	Seasonal apportioning values			Total predicted impact (birds/annum)	SPA population (breeding adults)	% increase in baseline mortality	Conclusion
	Breeding	Post-breeding	Pre-breeding				
Gannet	No connectivity	0.018	0.022	<0.1 to <0.1	59,124	<0.01 to <0.01	No potential for AEOI

1.5.3.139 The predicted impact of the Morgan Generation Assets alone on the gannet feature of the Hermaness, Saxa Vord and Valla Field SPA represents less than a 0.05% increase in baseline mortality of the SPA population. The potential impact magnitude for gannet is also lower than 0.5 birds/annum, noting that there is considerable precaution in the assessment. There is therefore considered to be no adverse effect on the site integrity of the Hermaness, Saxa Vord and Valla Field SPA as a result of potential impacts on gannet from the Morgan Generation Assets.

1.5.3.140 No in-combination assessment has been undertaken for kittiwake as the potential impact from the Morgan Generation Assets alone is predicted to be less than a 0.05% increase in baseline mortality. Therefore, it is considered that the Morgan Generation Assets will not make a measurable contribution to the existing in-combination impact. It can be concluded beyond reasonable scientific doubt that there is no risk of an AEOI on the Hermaness, Saxa Vord and Valla Field SPA as a result of disturbance and displacement from airborne sound and presence of vessels and infrastructure and/or collision risk with respect to operations and maintenance of the Morgan Generation Assets alone and in-combination with other plans and projects. The Hermaness, Saxa Vord and Valla Field SPA has not been taken through to the integrity test: Step 2 and therefore potential impacts on the kittiwake feature of the Hermaness, Saxa Vord and Valla Field SPA have not been considered further.

1.5.4 Summary of integrity test: Step 1

1.5.4.1 A summary of integrity test: Step 1 is provided in Table 1.46.

Table 1.46: Summary of integrity test: Step 1.

Note: sites and features highlighted in blue are those progress to the integrity test: Step 2

European site	Qualifying feature	Integrity test: Step 1 conclusion		Inclusion in Integrity test: Step 2 (Yes/No)	Justification
		Morgan Generation Assets alone	In-combination		
Morecambe Bay and Duddon Estuary SPA / Morecambe Bay Ramsar	Lesser black-backed gull	No potential for AEOI	No measurable contribution of Morgan Generation Assets to existing in-combination impact.	No	Potential impact represents less than a 0.05% increase in baseline mortality of relevant populations.
	Herring gull	No potential for AEOI	Progressed to integrity test: Step 2	Yes	In-combination impact represents more than a 1% increase in baseline mortality of the population at the SPA.
	Breeding seabird assemblage	No potential for AEOI	Progressed to integrity test: Step 2	Yes	Potential impacts on herring gull require further consideration.
Ribble and Alt Estuaries SPA and Ramsar	Lesser black-backed gull	No potential for AEOI	No measurable contribution of Morgan Generation Assets to existing in-combination impact.	No	Potential impact represents less than a 0.05% increase in baseline mortality of relevant populations.
	Breeding seabird assemblage	No potential for AEOI	No measurable contribution of Morgan Generation Assets to existing in-combination impact.	No	Potential impacts on individual features considered to present no risk of AEOI.
Bowland Fells SPA	Lesser black-backed gull	No potential for AEOI	No measurable contribution of Morgan Generation Assets to existing in-combination impact.	No	Potential impact represents less than a 0.05% increase in baseline mortality of relevant populations.
Copeland Islands SPA	Manx shearwater	No potential for AEOI	No measurable contribution of Morgan Generation Assets to existing in-combination impact.	No	Potential impact represents less than a 0.05% increase in baseline mortality of relevant populations.

European site	Qualifying feature	Integrity test: Step 1 conclusion		Inclusion in Integrity test: Step 2 (Yes/No)	Justification
		Morgan Generation Assets alone	In-combination		
Glannau Aberdaron ac Ynys Enlli / Aberdaron Coast and Bardsey Island SPA	Manx shearwater	No potential for AEOI	No measurable contribution of Morgan Generation Assets to existing in-combination impact.	No	Potential impact represents less than a 0.05% increase in baseline mortality of relevant populations.
Lambay Island SPA	Kittiwake	No potential for AEOI	No measurable contribution of Morgan Generation Assets to existing in-combination impact.	No	Potential impact represents less than a 0.05% increase in baseline mortality of relevant populations.
	Herring gull (non-breeding season)	No potential for AEOI	No measurable contribution of Morgan Generation Assets to existing in-combination impact.	No	Potential impact represents less than a 0.05% increase in baseline mortality of relevant populations.
	Guillemot (non-breeding season)	No potential for AEOI	No measurable contribution of Morgan Generation Assets to existing in-combination impact.	No	Potential impact represents less than a 0.05% increase in baseline mortality of relevant populations.
	Razorbill (non-breeding season)	No potential for AEOI	No measurable contribution of Morgan Generation Assets to existing in-combination impact	No	Potential impact represents less than a 0.05% increase in baseline mortality of relevant populations.
	Breeding seabird assemblage	No potential for AEOI	No measurable contribution of Morgan Generation Assets to existing in-combination impact.	No	Potential impacts on individual features considered to present no risk of AEOI.
Ireland's Eye SPA	Kittiwake	No potential for AEOI	Progressed to integrity test: Step 2	Yes	In-combination impact represents more than a 1% increase in baseline mortality of the population at the SPA.

European site	Qualifying feature	Integrity test: Step 1 conclusion		Inclusion in Integrity test: Step 2 (Yes/No)	Justification
		Morgan Generation Assets alone	In-combination		
Howth Head Coast SPA	Kittiwake	No potential for AEOI	No potential for AEOI.	No	Potential impact represents less than a 1% increase in baseline mortality of relevant populations.
Ailsa Craig SPA	Gannet	No potential for AEOI	No measurable contribution of Morgan Generation Assets to existing in-combination impact.	No	Potential impact represents less than a 0.05% increase in baseline mortality of relevant populations.
	Kittiwake	No potential for AEOI	No measurable contribution of Morgan Generation Assets to existing in-combination impact.	No	Potential impact represents less than a 0.05% increase in baseline mortality of relevant populations.
	Breeding seabird assemblage	No potential for AEOI	No measurable contribution of Morgan Generation Assets to existing in-combination impact.	No	Potential impacts on individual features considered to present no risk of AEOI.
Wicklow Head SPA	Kittiwake	No potential for AEOI	No measurable contribution of Morgan Generation Assets to existing in-combination impact.	No	Potential impact represents less than a 0.05% increase in baseline mortality of relevant populations.
Rathlin Island SPA	Kittiwake	No potential for AEOI	No measurable contribution of Morgan Generation Assets to existing in-combination impact.	No	Potential impact represents less than a 0.05% increase in baseline mortality of relevant populations.
	Guillemot (non-breeding season)	No potential for AEOI	No measurable contribution of Morgan Generation Assets to existing in-combination impact.	No	Potential impact represents less than a 0.05% increase in baseline mortality of relevant populations.
	Razorbill (non-breeding season)	No potential for AEOI	No measurable contribution of Morgan Generation Assets to existing in-combination impact.	No	Potential impact represents less than a 0.05% increase in baseline mortality of relevant populations.

European site	Qualifying feature	Integrity test: Step 1 conclusion		Inclusion in Integrity test: Step 2 (Yes/No)	Justification
		Morgan Generation Assets alone	In-combination		
	Breeding seabird assemblage	No potential for AEOI	Progressed to integrity test: Step 2	Yes	Potential impacts on guillemot require further consideration.
Skomer, Skokholm and the Seas off Pembrokeshire SPA	Kittiwake (non-breeding seasons)	No potential for AEOI	No measurable contribution of Morgan Generation Assets to existing in-combination impact.	No	Potential impact represents less than a 0.05% increase in baseline mortality of relevant populations.
	Lesser black-backed gull	No potential for AEOI	No measurable contribution of Morgan Generation Assets to existing in-combination impact.	No	Potential impact represents less than a 0.05% increase in baseline mortality of relevant populations.
	Manx shearwater	No potential for AEOI	No measurable contribution of Morgan Generation Assets to existing in-combination impact.	No	Potential impact represents less than a 0.05% increase in baseline mortality of relevant populations.
	Guillemot (non-breeding seasons)	No potential for AEOI	No measurable contribution of Morgan Generation Assets to existing in-combination impact.	No	Potential impact represents less than a 0.05% increase in baseline mortality of relevant populations.
	Razorbill (non-breeding seasons)	No potential for AEOI	No measurable contribution of Morgan Generation Assets to existing in-combination impact.	No	Potential impact represents less than a 0.05% increase in baseline mortality of relevant populations.
	Breeding seabird assemblage	No potential for AEOI	No measurable contribution of Morgan Generation Assets to existing in-combination impact.	No	Potential impacts on individual features considered to present no risk of AEOI.
North Colonsay and Western Cliffs SPA	Kittiwake	No potential for AEOI	No measurable contribution of Morgan Generation Assets to existing in-combination impact.	No	Potential impact represents less than a 0.05% increase in baseline mortality of relevant populations.

European site	Qualifying feature	Integrity test: Step 1 conclusion		Inclusion in Integrity test: Step 2 (Yes/No)	Justification
		Morgan Generation Assets alone	In-combination		
	Guillemot (non-breeding seasons)	No potential for AEOI	No measurable contribution of Morgan Generation Assets to existing in-combination impact.	No	Potential impact represents less than a 0.05% increase in baseline mortality of relevant populations.
	Breeding seabird assemblage	No potential for AEOI	No measurable contribution of Morgan Generation Assets to existing in-combination impact.	No	Potential impacts on individual features considered to present no risk of AEOI.
Grassholm SPA	Gannet	No potential for AEOI	No measurable contribution of Morgan Generation Assets to existing in-combination impact.	No	Potential impact represents less than a 0.05% increase in baseline mortality of relevant populations.
Saltee Islands SPA	Gannet	No potential for AEOI	No measurable contribution of Morgan Generation Assets to existing in-combination impact.	No	Potential impact represents less than a 0.05% increase in baseline mortality of relevant populations.
	Kittiwake	No potential for AEOI	No measurable contribution of Morgan Generation Assets to existing in-combination impact.	No	Potential impact represents less than a 0.05% increase in baseline mortality of relevant populations.
	Guillemot (non-breeding season)	No potential for AEOI	No measurable contribution of Morgan Generation Assets to existing in-combination impact.	No	Potential impact represents less than a 0.05% increase in baseline mortality of relevant populations.
	Razorbill (non-breeding season)	No potential for AEOI	No measurable contribution of Morgan Generation Assets to existing in-combination impact.	No	Potential impact represents less than a 0.05% increase in baseline mortality of relevant populations.
	Breeding seabird assemblage	No potential for AEOI	No measurable contribution of Morgan Generation Assets to existing in-combination impact.	No	Potential impacts on individual features considered to present no risk of AEOI.

European site	Qualifying feature	Integrity test: Step 1 conclusion		Inclusion in Integrity test: Step 2 (Yes/No)	Justification
		Morgan Generation Assets alone	In-combination		
Mingulay and Berneray SPA	Guillemot (non-breeding seasons)	No potential for AEOI Mingulay and Berneray SPA	No measurable contribution of Morgan Generation Assets to existing in-combination impact.	No	Potential impact represents less than a 0.05% increase in baseline mortality of relevant populations.
	Razorbill (non-breeding season)	No potential for AEOI	No measurable contribution of Morgan Generation Assets to existing in-combination impact.	No	Potential impact represents less than a 0.05% increase in baseline mortality of relevant populations.
	Breeding seabird assemblage	No potential for AEOI	No measurable contribution of Morgan Generation Assets to existing in-combination impact.	No	Potential impacts on individual features considered to present no risk of AEOI.
The Shiant Isles SPA	Razorbill (non-breeding season)	No potential for AEOI	No measurable contribution of Morgan Generation Assets to existing in-combination impact.	No	Potential impact represents less than a 0.05% increase in baseline mortality of relevant populations.
	Breeding seabird assemblage	No potential for AEOI	No measurable contribution of Morgan Generation Assets to existing in-combination impact.	No	Potential impacts on individual features considered to present no risk of AEOI.
Isles of Scilly SPA / Isles of Scilly Ramsar	Lesser black-backed gull (non-breeding season)	No potential for AEOI	No measurable contribution of Morgan Generation Assets to existing in-combination impact.	No	Potential impact represents less than a 0.05% increase in baseline mortality of relevant populations.
	Great black-backed gull (non-breeding season)	No potential for AEOI	Progressed to integrity test: Step 2	Yes	In-combination impact represents more than a 1% increase in baseline mortality of the population at the SPA.
	Manx shearwater	No potential for AEOI	No measurable contribution of Morgan Generation Assets to existing in-combination impact.	No	Potential impact represents less than a 0.05% increase

European site	Qualifying feature	Integrity test: Step 1 conclusion		Inclusion in Integrity test: Step 2 (Yes/No)	Justification
		Morgan Generation Assets alone	In-combination		
					in baseline mortality of relevant populations.
	Breeding seabird assemblage	No potential for AEOI	Progressed to integrity test: Step 2	Yes	Potential impacts on great black-backed gull require further consideration.
Handa SPA	Guillemot (non-breeding season)	No potential for AEOI Handa SPA	No measurable contribution of Morgan Generation Assets to existing in-combination impact.	No	Potential impact represents less than a 0.05% increase in baseline mortality of relevant populations.
	Razorbill (non-breeding season)	No potential for AEOI	No measurable contribution of Morgan Generation Assets to existing in-combination impact.	No	Potential impact represents less than a 0.05% increase in baseline mortality of relevant populations.
	Breeding seabird assemblage	No potential for AEOI	No measurable contribution of Morgan Generation Assets to existing in-combination impact.	No	Potential impacts on individual features considered to present no risk of AEOI.
St Kilda SPA	Guillemot (non-breeding season)	No potential for AEOI	No measurable contribution of Morgan Generation Assets to existing in-combination impact.	No	Potential impact represents less than a 0.05% increase in baseline mortality of relevant populations.
	Gannet (non-breeding season)	No potential for AEOI	No measurable contribution of Morgan Generation Assets to existing in-combination impact.	No	Potential impact represents less than a 0.05% increase in baseline mortality of relevant populations.
	Fulmar	No potential for AEOI	No measurable contribution of Morgan Generation Assets to existing in-combination impact.	No	Potential impact represents less than a 0.05% increase in baseline mortality of relevant populations.

European site	Qualifying feature	Integrity test: Step 1 conclusion		Inclusion in Integrity test: Step 2 (Yes/No)	Justification
		Morgan Generation Assets alone	In-combination		
	Manx shearwater	No potential for AEOI	No measurable contribution of Morgan Generation Assets to existing in-combination impact.	No	Potential impact represents less than a 0.05% increase in baseline mortality of relevant populations.
	Breeding seabird assemblage	No potential for AEOI	No measurable contribution of Morgan Generation Assets to existing in-combination impact.	No	Potential impacts on individual features considered to present no risk of AEOI.
Cape Wrath SPA	Kittiwake (non-breeding seasons)	No potential for AEOI	No potential for AEOI.	No	Potential impact represents less than a 1% increase in baseline mortality of relevant populations.
	Guillemot (non-breeding seasons)	No potential for AEOI	No measurable contribution of Morgan Generation Assets to existing in-combination impact.	No	Potential impact represents less than a 1% increase in baseline mortality of relevant populations.
	Breeding seabird assemblage	No potential for AEOI	Progressed to integrity test: Step 2	Yes	Potential impacts guillemot require further consideration.
Flannan Isles SPA	Guillemot (non-breeding seasons)	No potential for AEOI	Progressed to integrity test: Step 2	Yes	In-combination impact represents more than a 1% increase in baseline mortality of the population at the SPA.
	Breeding seabird assemblage	No potential for AEOI	Progressed to integrity test: Step 2	Yes	Potential impacts guillemot require further consideration.
North Rona and Sula Sgeir SPA	Gannet (non-breeding seasons)	No potential for AEOI	No measurable contribution of Morgan Generation Assets to existing in-combination impact.	No	Potential impact represents less than a 0.05% increase in baseline mortality of relevant populations.

European site	Qualifying feature	Integrity test: Step 1 conclusion		Inclusion in Integrity test: Step 2 (Yes/No)	Justification
		Morgan Generation Assets alone	In-combination		
	Breeding seabird assemblage	No potential for AEOI	No measurable contribution of Morgan Generation Assets to existing in-combination impact.	No	Potential impacts on individual features considered to present no risk of AEOI.
Buchan Ness to Collieston Coast SPA	Kittiwake (non-breeding seasons)	No potential for AEOI	No measurable contribution of Morgan Generation Assets to existing in-combination impact.	No	Potential impact represents less than a 0.05% increase in baseline mortality of relevant populations.
	Breeding seabird assemblage	No potential for AEOI	No measurable contribution of Morgan Generation Assets to existing in-combination impact.	No	Potential impacts on individual features considered to present no risk of AEOI.
East Caithness Cliffs SPA	Kittiwake (non-breeding seasons)	No potential for AEOI	No measurable contribution of Morgan Generation Assets to existing in-combination impact.	No	Potential impact represents less than a 0.05% increase in baseline mortality of relevant populations.
	Breeding seabird assemblage	No potential for AEOI	No measurable contribution of Morgan Generation Assets to existing in-combination impact.	No	Potential impacts on individual features considered to present no risk of AEOI.
Flamborough and Filey Coast SPA	Kittiwake (non-breeding seasons)	No potential for AEOI	No measurable contribution of Morgan Generation Assets to existing in-combination impact.	No	Potential impact represents less than a 0.05% increase in baseline mortality of relevant populations.
	Breeding seabird assemblage	No potential for AEOI	No measurable contribution of Morgan Generation Assets to existing in-combination impact.	No	Potential impacts on individual features considered to present no risk of AEOI.
Forth Islands SPA	Gannet (non-breeding seasons)	No potential for AEOI	No measurable contribution of Morgan Generation Assets to existing in-combination impact.	No	Potential impact represents less than a 0.05% increase in baseline mortality of relevant populations.

European site	Qualifying feature	Integrity test: Step 1 conclusion		Inclusion in Integrity test: Step 2 (Yes/No)	Justification
		Morgan Generation Assets alone	In-combination		
	Breeding seabird assemblage	No potential for AEOI	No measurable contribution of Morgan Generation Assets to existing in-combination impact.	No	Potential impacts on individual features considered to present no risk of AEOI.
Hermaness, Saxa Vord and Valla Field SPA	Gannet (non-breeding seasons)	No potential for AEOI	No measurable contribution of Morgan Generation Assets to existing in-combination impact.	No	Potential impact represents less than a 0.05% increase in baseline mortality of relevant populations.
	Breeding seabird assemblage	No potential for AEOI	No measurable contribution of Morgan Generation Assets to existing in-combination impact.	No	Potential impacts on individual features considered to present no risk of AEOI.
Rum SPA	Manx shearwater	No potential for AEOI	No measurable contribution of Morgan Generation Assets to existing in-combination impact.	No	Potential impact represents less than a 0.05% increase in baseline mortality of relevant populations.
	Breeding seabird assemblage	No potential for AEOI	No measurable contribution of Morgan Generation Assets to existing in-combination impact.	No	Potential impacts on individual features considered to present no risk of AEOI.
Sule Skerry and Sule Stack SPA	Guillemot (non-breeding season)	No potential for AEOI	No measurable contribution of Morgan Generation Assets to existing in-combination impact.	No	Potential impact represents less than a 0.05% increase in baseline mortality of relevant populations.
	Gannet (non-breeding seasons	No potential for AEOI	No measurable contribution of Morgan Generation Assets to existing in-combination impact.	No	Potential impact represents less than a 0.05% increase in baseline mortality of relevant populations.
	Breeding seabird assemblage	No potential for AEOI	No measurable contribution of Morgan Generation Assets to existing in-combination impact.	No	Potential impacts on individual features considered to present no risk of AEOI.

European site	Qualifying feature	Integrity test: Step 1 conclusion		Inclusion in Integrity test: Step 2 (Yes/No)	Justification
		Morgan Generation Assets alone	In-combination		
Troup, Pennan and Lion's Heads SPA	Kittiwake (non-breeding seasons)	No potential for AEOI	No measurable contribution of Morgan Generation Assets to existing in-combination impact.	No	Potential impact represents less than a 0.05% increase in baseline mortality of relevant populations.
	Breeding seabird assemblage	No potential for AEOI	No measurable contribution of Morgan Generation Assets to existing in-combination impact.	No	Potential impacts on individual features considered to present no risk of AEOI.
West Westray SPA	Kittiwake (non-breeding seasons)	No potential for AEOI	No measurable contribution of Morgan Generation Assets to existing in-combination impact.	No	Potential impact represents less than a 0.05% increase in baseline mortality of relevant populations.
	Breeding seabird assemblage	No potential for AEOI	No measurable contribution of Morgan Generation Assets to existing in-combination impact.	No	Potential impacts on individual features considered to present no risk of AEOI.
Irish Sea Front SPA	Manx shearwater	No potential for AEOI	No measurable contribution of Morgan Generation Assets to existing in-combination impact.	No	Potential impact on constituent populations is not considered to present a risk of AEOI.
North-west Irish Sea SPA	Kittiwake	No potential for AEOI	Progressed to integrity test: Step 2	Yes	Potential for AEOI on constituent populations.
	Herring gull (non-breeding seasons)	No potential for AEOI	No measurable contribution of Morgan Generation Assets to existing in-combination impact.	No	Potential impact on constituent populations is not considered to present a risk of AEOI.
	Guillemot (non-breeding seasons)	No potential for AEOI	No measurable contribution of Morgan Generation Assets to existing in-combination impact.	No	Potential impact on constituent populations is not considered to present a risk of AEOI.

European site	Qualifying feature	Integrity test: Step 1 conclusion		Inclusion in Integrity test: Step 2 (Yes/No)	Justification
		Morgan Generation Assets alone	In-combination		
	Razorbill (non-breeding seasons)	No potential for AEOI	No measurable contribution of Morgan Generation Assets to existing in-combination impact.	No	Potential impact on constituent populations is not considered to present a risk of AEOI.
Seas off St Kilda SPA	Guillemot (non-breeding season)	No potential for AEOI	No measurable contribution of Morgan Generation Assets to existing in-combination impact.	No	Potential impact on constituent populations is not considered to present a risk of AEOI.
	Fulmar	No potential for AEOI	No measurable contribution of Morgan Generation Assets to existing in-combination impact.	No	Potential impact on constituent populations is not considered to present a risk of AEOI.
	Gannet	No potential for AEOI	No measurable contribution of Morgan Generation Assets to existing in-combination impact.	No	Potential impact on constituent populations is not considered to present a risk of AEOI.

1.6 Assessment of potential Adverse Effect on Integrity: Step 2

1.6.1 Sites considered within the assessment of potential Adverse Effect on Integrity: Step 2

1.6.1.1 The Assessment of potential Adverse Effect on Integrity: Step 2 will include an assessment of the potential for adverse effect on site integrity on seven SPAs and two Ramsar sites and associated features listed in Table 1.47.

Table 1.47: SPAs and Ramsar sites and relevant offshore ornithological features for which the potential for AEOI could not be discounted in the integrity test: Step 1.

SPA	Qualifying feature
Morecambe Bay and Duddon Estuary SPA / Morecambe Bay Ramsar	Herring gull *Larus argentatus*
	Breeding seabird assemblage
Ireland's Eye SPA	Kittiwake *Rissa tridactyla*
Isles of Scilly SPA / Isles of Scilly Ramsar	Great black-backed gull *Larus marinus*
	Breeding seabird assemblage
Cape Wrath SPA	Kittiwake *Rissa tridactyla*
	Breeding seabird assemblage
Flannan Isles SPA	Guillemot *Uria aalge*
	Breeding seabird assemblage
North-west Irish Sea SPA	Kittiwake *Rissa tridactyla*

1.6.2 Baseline Information

1.6.2.1 Baseline information on the offshore ornithological features of the SPAs and Ramsar sites identified for further assessment within the integrity test: Step 2 has been gathered through a comprehensive desktop study of existing studies and datasets and supported by 24-month site-specific aerial survey data. Full details of which are presented within Volume 2, Chapter 5: Offshore ornithology of the Environmental Statement (Document Reference F2.5) and Volume 4, Annex 5.1: Offshore ornithology baseline characterisation technical report of the Environmental Statement (Document reference F4.5.1).

Morecambe Bay and Duddon Estuary SPA/Morecambe Bay Ramsar

1.6.2.2 The integrity test: Step 1 has identified the need for further assessment in relation to in-combination impacts on the herring gull and breeding bird assemblage features of the Morecambe Bay and Duddon Estuary SPA/Morecambe Bay Ramsar.

Site description

1.6.2.3 The Morecambe Bay and Duddon Estuary SPA / Morecambe Bay Ramsar is located on the northern Lancashire and southern Cumbria coast and incorporates the second largest embayment in Britain. The site represents the largest continuous area of intertidal mudflat and sandflat in the UK (Natural England, 2023a). Several major estuaries drain into the bay including those associated with the river Wyre, Lune, Kent, Leven and Duddon.

1.6.2.4 The SPA was designated in 2017 to incorporate two existing SPAs: Morecambe Bay SPA and Duddon Estuary SPA in addition to a marine foraging area for breeding tern species. The updated designation incorporated the original features of the two previous SPAs and the addition of newly qualified species. This therefore includes 27 qualifying features within two assemblages, breeding seabirds and non-breeding waterbirds.

Feature accounts

Herring gull

1.6.2.5 The Morecambe Bay and Duddon Estuary SPA is designated to protect 10,000 breeding pairs of herring gull however, the population has experienced a significant decline with the most recent count (2016 to 2023) estimating only 777 breeding pairs at the SPA. Herring gull is a component of the breeding bird assemblage at the SPA.

1.6.2.6 The breeding population of herring gull at the SPA, which also forms part of the South Walney and Piel Channel Flats Site of Special Scientific Interest (SSSI) designation, is of national and international importance. The species breeds within the SPA between May and July at colonies at South Walney and Hodbarrow. Herring gull utilise areas around the colony most frequently, with terrestrial and intertidal habitats used, especially nearby mussel beds. Mussel beds to the south of Barrow-in-Furness are utilised with birds also frequently found on intertidal mud flats, nearby fields, rubbish dumps and bodies of freshwater (Natural England, 2023; Thaxter *et al.,* 2017). There is limited usage of the marine environment by birds from the SPA (Thaxter *et al.,* 2017).

Breeding seabird assemblage

1.6.2.7 The Morecambe Bay and Duddon Estuary SPA is designated to protect a breeding seabird assemblage consisting of more than 20,000 breeding pairs. This includes black-headed gull, lesser black-backed gull, herring gull, great black-backed gull, little tern, Sandwich tern, common tern and Arctic tern. Only the herring gull component of this assemblage is relevant to the assessments required in the Integrity test: Step 2.

Conservation objectives

1.6.2.8 The conservation objectives for the Morecambe Bay and Duddon Estuary SPA are (Natural England, 2019):

- Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring:
  - The extent and distribution of the habitats of the qualifying features
  - The structure and function of the habitats of the qualifying features
  - The supporting processes on which the habitats of the qualifying features rely
  - The population of each of the qualifying features
  - The distribution of the qualifying features within the site.

1.6.2.9 Supplementary advice in relation certain attributes of the herring gull population at the SPA is provided by Natural England (2023a). Those relevant to the assessments required in this ISAA are summarised in Table 1.48.

Table 1.48: Relevant supplementary advice for the herring gull feature of the Morecambe Bay and Duddon Estuary SPA (Natural England, 2023a).

Attribute	Target	Supporting notes (Natural England, 2023a)
Breeding population: abundance	Restore the size of the breeding population to a level which is above 10,000 pairs whilst avoiding deterioration from its current level as indicated by the latest mean peak count or equivalent	*'At the time of classification, the most recent data (2011-2015) showed a five year peak mean of 1,596 breeding pairs within Morecambe Bay and Duddon Estuary SPA. The current biogeographic population is estimated at 340,000 pairs, within the SPA the population makes up only 0.5% of this. Originally at the time of citation in 1991 there were 10,000 pairs representing 7% of the GB population and 1% of the biogeographic population at that time. The original baseline citation of 10,000 pairs (1991) has been retained for the new SPA (Natural England, 2016).* *A restore target is set as the current population of breeding herring gull has declined from 10,000 pairs to 1,596 since the time of citation in 1991.'*
Connectivity with supporting habitats	Maintain safe passage of birds moving between nesting and feeding areas	*"During the breeding season, individuals tend to use the area immediately around the colony most frequently, this includes nearby mussel beds for feeding as well as the South Walney and Piel Channel Flats SSSI which encompasses the breeding colonies (Thaxter et al., 2017).* *There is evidence from survey or monitoring that shows the feature to be in a good condition and/or currently un-impacted by anthropogenic activities."*
Productivity	Maintain or recover productivity so that breeding success is maximised within the constraints of the site.	Not available

Ireland's Eye SPA

Site description

1.6.2.10 The Ireland's Eye SPA is a 24 hectare island located 1.5 km north of Howth in county Dublin, Ireland (NPWS, 2011). The designation encompasses Ireland's Eye, Rowan Rocks, Thulla, Thulla Rocks and Carrageen Bay. The site also includes a seaward extension out to 200 m in the west and 500 m to the north and east. Vertical cliffs are present on the north and east sides of the island. On the western shore there are sandy and shingle beaches. The remainder of the island is covered by glacial drift.

1.6.2.11 The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for the following species: cormorant, herring gull, kittiwake, guillemot and razorbill (NPWS, 2011).

Feature accounts

Kittiwake

1.6.2.12 The Ireland's Eye SPA is designated to protect 941 pairs of breeding kittiwake. Since designation the population has decreased with the most recent count at the SPA estimating 455 breeding pairs of kittiwake (Burnell *et al.,* 2023).

Conservation objectives

1.6.2.13 The primary conservation objective for the Ireland's Eye SPA is (NPWS, 2022):

- To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA.

1.6.2.14 Favourable conservation status in the context of the Habitats Directive for habitats and species is defined as:

- Favourable conservation status of a habitat is achieved when:

1.6.2.15 Its natural range, and area it covers within that range, are stable or increasing, and

  – The specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future

1.6.2.16 The conservation status of its typical species is favourable.

- The favourable conservation status of a species is achieved when:
  – Population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats
  – The natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future
  – There is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

Rathlin Island SPA

Site description

1.6.2.17 Rathlin Island SPA, is situated off the north Antrim coast of Northern Ireland. Covering an area of 33.45 km², this SPA is characterised by a diverse range of geological features, including basalt and chalk cliffs, sea stacks, and areas of maritime grassland. Sediments within Rathlin Island SPA include coastal deposits influenced by basalt and chalk substrates.

1.6.2.18 The Rathlin Island SPA has been classified as an extension and renaming of the pre-existing Rathlin Island Cliffs SPA. This designation aligns with the requirements stipulated in Article 4.1 of EC Directive 79/409 on the Conservation of Wild Birds. serving to conserve nationally significant populations of Annex 1 species. The site qualifies under Article 4.2 of the Directive by sustaining internationally important breeding numbers of migratory species such as guillemot. The SPA's designation is in accordance with the directives and regulations for bird conservation, highlighting its ecological significance and contribution to avian biodiversity.

1.6.2.19 The SPA is designated for the protection of nationally important populations of peregrine falcons *Falco peregrinus* and red-billed chough *Pyrrhocorax pyrrhocorax*.

Additionally, the SPA supports internationally vital breeding numbers of razorbill, guillemot, and kittiwake. The site plays a crucial role in sustaining over 20,000 breeding seabirds.

Feature accounts

Guillemot

1.6.2.20 The Rathlin Island SPA is designated to protect 41,887 individual guillemot (28,064 breeding pairs). Since designation the population at the SPA has increased significantly with over 200,000 breeding pairs now present. r

Conservation objectives

1.6.2.21 The conservation objectives for the Rathlin Island SPA are (Enlander, 2015):

- To maintain each feature in favourable condition

1.6.2.22 For each feature a number of component objectives are defined. The component objectives for guillemot are:

- To maintain or enhance the population of the qualifying species
- Fledging success sufficient to maintain or enhance population
- To maintain or enhance the range of habitats utilised by the qualifying species
- To ensure that the integrity of the site is maintained
- To ensure there is no significant disturbance of the species and
- To ensure that the following are maintained in the long term:
  - Population of the species as a viable component of the site
  - Distribution of the species within site
  - Distribution and extent of habitats supporting the species
  - Structure, function and supporting processes of habitats supporting the species.

Isles of Scilly SPA

Site description

1.6.2.23 The Isles of Scilly SPA, designated under the EC Directive 79/409 on the Conservation of Wild Birds, is a crucial conservation area situated approximately 45 km offshore from Land's End in the United Kingdom. Comprising over 200 granite islands and rocks, it stands as Britain's only oceanic island archipelago. The SPA's boundary encapsulates most of the islands and islets within the Isles of Scilly archipelago, encompassing vital nesting sites for breeding seabirds. The marine area within the SPA is utilised by birds for foraging, loafing and other essential behaviours. With a total area of approximately 133.33 km^2, the Isles of Scilly SPA showcases diverse marine communities, subtidal sediments ranging from sand to gravelly sand and nationally rare marine species in subtidal rocky reef areas. The site is recognised for extensive seagrass beds and serves as a protected breeding ground for grey seals.

1.6.2.24 Classified on August 10, 2001, the SPA's status was extended on November 17, 2020, to include additional features including shag and great black-backed gull, along with marine areas. The Isles of Scilly SPA is a key site for the regular presence of qualifying

species, meeting criteria outlined in both Article 4.1 and Article 4.2 of the Birds Directive, further emphasising its importance for bird conservation in the region.

Feature accounts

Great black-backed gull

1.6.2.25 The Isles of Scilly SPA is designated to protect a breeding population of 1,882 great black-backed gulls. The most recent count at the SPA indicates that the population has decreased slightly to 1,618 breeding individuals, although the population had been showing an increasing trend (Natural England, 2018). The species are widespread across the 45 islands that comprise the SPA with the largest colonies on the islands of Annet, Gweal, Rosevear and the Eastern Isles (Heaney and St Pierre, 2017; Natural England, 2023b). The Isles of Scilly SPA is the most important site for the species in the UK.

Breeding seabird assemblage

1.6.2.26 The Isles of Scilly SPA/Isles of Scilly Ramsar is designated to protect a breeding seabird assemblage comprising more than 20,000 breeding pairs of seabirds. The main features of the assemblage include storm petrel, shag, lesser black-backed gull and great black-backed gull with other seabird species also occurring in smaller numbers. Only the great black-backed gull component of this assemblage is relevant to the assessments required in the Integrity test: Step 2.

Conservation objectives

1.6.2.27 The conservation objectives for the Isles of Scilly SPA are (Natural England, 2023b) to:

- Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring:
  - The extent and distribution of the habitats of the qualifying features
  - The structure and function of the habitats of the qualifying features
  - The supporting processes on which the habitats of the qualifying features rely
  - The population of each of the qualifying features
  - The distribution of the qualifying features within the site.

1.6.2.28 Supplementary advice in relation certain attributes of the great black-backed gull population at the SPA is provided by Natural England (2023b). Those relevant to the assessments required in this ISAA are summarised in Table 1.49.

Table 1.49: Relevant supplementary advice for the great black-backed gull feature of the Isles of Scilly SPA (Natural England, 2023b).

Attribute	Target	Supporting notes (Natural England, 2023b)
Breeding population: abundance	Maintain the size of the breeding population at a level which is above 941 (Apparently Occupied Nests, equivalent to pairs), whilst avoiding deterioration from its current level as indicated by the	*"Great black-backed gulls Larus marinus breed on 45 separate islands (Heaney and St. Pierre, 2017), the main colony being in the Eastern Isles island group. All-island surveys in 2015 and 2016 returned a total of 984 breeding pairs, with 941 at sites within the SPA, equating to 0.90% of the biogeographic total of 105,000 pairs (Natural England, 2018).*

Attribute	Target	Supporting notes (Natural England, 2023b)
	latest mean peak count or equivalent.	*Great black-backed gull abundance within the Isles of Scilly SPA (Apparently Occupied Nests, equivalent to pairs) (Heaney and St. Pierre, 2017), (Natural England, 2018).* *2000 = 743* *2006 = 835* *2015/16 = 941.* *From the first systematic count in 1969, recording 1,200 pairs, the number of Great black-backed gulls nesting in Scilly increased to a peak of 1,583 pairs in 1974 before declining to a low of 808 pairs in 1999. Since then, numbers have been increasing.* *Additional seabird monitoring and research reports, including productivity data (Heaney, 2018), (Heaney, 2019), (Heaney, 2020), (Heaney, 2021) can be found in the Technical Reports section of the Isles of Scilly Wildlife Trust Website (Isles of Scilly Wildlife Trust, N/A).* *The target has been set using expert judgement based on knowledge of the sensitivity of the feature to activities that are occurring / have occurred on the site."*
Connectivity with supporting habitats	Maintain safe passage of birds moving between nesting and feeding areas.	*"Great black-backed gulls use the Isles of Scilly SPA for foraging during the breeding season, and will regularly travel around the SPA and the 45 occupied breeding islands (Heaney and St. Pierre, 2017), some of which are outside the SPA boundary. Connectivity between feeding, roosting and breeding sites should be maintained.* *The target has been set using expert judgement based on knowledge of the sensitivity of the feature to activities that are occurring / have occurred on the site."*
Productivity	Maintain or recover productivity so that breeding success is maximised within the constraints of the site.	Not available

Cape Wrath SPA

Site description

1.6.2.29 Cape Wrath SPA, situated in the northwest of Scotland, includes two sections of Torridonian sandstone and Lewisian gneiss cliffs around Cape Wrath headland. These cliffs are crucial breeding grounds for large seabird colonies, contributing to the region's biodiversity. The SPA's boundary aligns with Cape Wrath SSSI, extending approximately 2 km into the marine environment, covering the seabed, water column, and surface. Classified on 15 March 1996, the SPA received a marine extension on 25th September 2009.

1.6.2.30 Covering an area of 67.37 km², Cape Wrath SPA qualifies under Article 4.2 by regularly supporting over 20,000 individual seabirds. Notably, it hosts a significant population of seabirds, with 50,000 individuals regularly present. This includes nationally important populations of various species, such as kittiwake, guillemot, razorbill, puffin and fulmar.

Feature accounts

Kittiwake

1.6.2.31 The Cape Wrath SPA is designated to protect 19,400 breeding kittiwake (9,700 breeding pairs). The most recent count at the SPA indicates that the population has increased significantly to over 25,500 breeding pairs.

Breeding seabird assemblage

1.6.2.32 The Cape Wrath SPA is designated to protect a breeding seabird assemblage comprising more than 20,000 breeding pairs of seabirds. The main features of the assemblage include kittiwake, guillemot, razorbill, puffin and fulmar. Only the kittiwake component of this assemblage is relevant to the assessments required in the Integrity test: Step 2.

Conservation objectives

1.6.2.33 The Conservation Objectives for the Cape Wrath SPA are:

- To avoid deterioration of the habitats of the qualifying species (listed below) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained
- To ensure for the qualifying species that the following are maintained in the long term:
  - Population of the species as a viable component of the site
  - Distribution of the species within site
  - Distribution and extent of habitats supporting the species
  - Structure, function and supporting processes of habitats supporting the species
  - No significant disturbance of the species.

Flannan Isles SPA

Site description

1.6.2.34 The Flannan Isles SPA comprises seven rocky islands, outlying skerries and adjacent coastal waters approximately 30 km west of Lewis in the Outer Hebrides, northwest Scotland. The vegetation of the islands is predominantly maritime grassland (Scottish Natural Heritage, 2009). The boundary of the Special Protection Area overlaps with the boundary of the Flannan Isles SSSI, and the seaward extension extends approximately 2 km into the marine environment.

Feature accounts

Guillemot

1.6.2.35 The Flannan Isles SPA is designated to protect 21,930 individual guillemots. The most recent count at the SPA (2021) indicates that the population has declined to 7,547 breeding individuals.

Breeding seabird assemblage

1.6.2.36 The Flannan Isles SPA is designated to protect a breeding seabird assemblage comprising more than 20,000 breeding pairs of seabirds. The main features of the assemblage include guillemot, razorbill. Puffin, fulmar and kittiwake. Only the guillemot component of this assemblage is relevant to the assessments required in the Integrity test: Step 2.

Conservation objectives

1.6.2.37 The Conservation Objectives for the Flannan Isles SPA are:

- To avoid deterioration of the habitats of the qualifying species (listed below) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained
- To ensure for the qualifying species that the following are maintained in the long term:
  - Population of the species as a viable component of the site
  - Distribution of the species within site
  - Distribution and extent of habitats supporting the species
  - Structure, function and supporting processes of habitats supporting the species
  - No significant disturbance of the species.

North-west Irish Sea SPA

Site description

1.6.2.38 The North-west Irish Sea SPA which is located along the coasts of counties Louth, Meath and Dublin covers an area of approximately 2,333 km^2 (NPWS, 2023). The SPA protects a marine resource of importance for marine birds from adjacent SPAs designated to protect breeding colonies of multiple seabird species. A number of estuaries and bays open into the SPA along with connecting coastal stretches of intertidal and shallow subtidal habitats which provide safe feeding and roosting habitats for waterbirds.

1.6.2.39 The site is a SPA under the E.U. Birds Directive, of special conservation interest for the following species: common scoter, red-throated diver, great northern diver, fulmar, Manx shearwater, shag, cormorant, little gull, kittiwake, black-headed gull, common gull, lesser black-backed gull, herring gull, great black-backed gull, little tern, roseate tern, common tern, Arctic tern, puffin, razorbill and guillemot.

Feature accounts

Kittiwake

1.6.2.40 Of relevance to this assessment, the SPA affords protection to the kittiwake feature of the Ireland's Eye SPA which is likely to use the SPA as a foraging resource.

Conservation objectives

1.6.2.41 The conservation objectives for the kittiwake feature of the North-west Irish Sea SPA are (NPWS, 2023):

- To restore the favourable conservation condition of kittiwake in North-west Irish Sea SPA, which is defined by the following list of attributes and targets in Table 1.50.

Table 1.50: List of attributes and targets associated with the conservation objective for kittiwake at the North-west Irish Sea SPA.

Attribute	Measure	Target	Supporting notes (NPWS, 2023)
Population size	Number	Long term SPA population trend is stable or increasing	*"Kittiwake is present within the North-west Irish Sea SPA throughout the year. Breeding kittiwake is a SCI for Lambay Island (004069), Howth Head (004113) and Ireland's Eye (004117) SPAs; all of which declined over the period 1999-2015 (19% to 3,320 pairs; 22% to 1,773 pairs; 52% to 455 pairs respectively) (Cummins et al., 2019). It is likely that this SPA does not contain all relevant foraging resources for all of the aforementioned SPAs (Baer and Newton, 2012; Moss et al., 2016; Power et al., 2021). Conversely kittiwake, breeding at other colonies and non-breeding individuals may use the North-west Irish Sea SPA during the breeding period. Based on Jessopp et al. (2018) data for summer, autumn and winter surveys of the western Irish Sea 1,632, 2,858, and 944 individuals are estimated to have occurred in the SPA, respectively."*
Spatial distribution	Hectares, time and intensity of use	Sufficient number of locations, area, and availability (in terms of timing and intensity of use) of suitable habitat to support the population	*"Distribution encapsulates the number of locations and area of potentially suitable habitat for the population and its availability for use. The suitability and availability of habitat areas may vary through time. This will affect the spatio-temporal patterns of use of the habitats by kittiwake. Jessopp et al. (2018) noted that sightings occurred throughout the western Irish Sea survey area, however, there was a distinct change in the distribution of sightings between the summer breeding season and the subsequent autumn and winter periods. In contrast to other gull species, and in all three seasons, areas of high sightings density occurred some distance from the coast. Based on several studies, Woodward et al. (2019) provides estimates of foraging ranges from the nest site during the breeding season (i.e. overall mean, mean of maximum distances across all studies, and maximum distance recorded) for kittiwake, which are 55 km, 156 km, and 770 km respectively (see Power et al., 2021)".*
Forage spatial distribution, extent, abundance and availability	Location and hectares, and forage biomass	Sufficient number of locations, area of suitable habitat and available forage biomass to support the population target	*"Kittiwake is a surface feeding seabird and primarily piscivorous (e.g. sandeels, herring, gadoids) with some invertebrates (e.g. euphausids, amphipods) in the diet also recorded (Hatch et al., 2020)".*
Disturbance across the site	Intensity, frequency, timing and duration	The intensity, frequency, timing and duration of disturbance occurs at levels that do not significantly impact the achievement of targets for population size and spatial distribution	*"The impact of any significant disturbance (direct or indirect) to the population will ultimately affect the achievement of targets for population size and/or spatial distribution. Disturbance contributes to increased energetic expenditure which can result in increased likelihood of mortality or reduced fitness (if energy expenditure is greater than energy gain) and, in turn, negatively impact population trends. Factors such as intensity, frequency, timing and duration of a (direct or indirect) disturbance source must be taken into account to determine the potential impact upon the targets for population size and spatial distribution. Seabird species can make extensive use of the marine waters adjacent to their breeding colonies for non site-specific maintenance behaviours (e.g. courtship, bathing, preening) as defined in McSorley et al. (2003)".*

Attribute	Measure	Target	Supporting notes (NPWS, 2023)
Barriers to connectivity	Number, location, shape, area (hectares)	The number, location, shape and area of barriers do not significantly impact the site population's access to the SPA or other ecologically important site outside the SPA	*"Kittiwake require regular access to marine waters ecologically connected to their colonies during the breeding season and on migration. Barriers limiting the population's access to this SPA or ecologically important sites outside the SPA will ultimately affect the achievement of targets for population trend and/or spatial distribution. Factors such as the number, location, shape and area of potential barriers must be taken into account to determine their potential impact. Access to ecologically important sites outside the SPA must also be considered as a single SPA may not satisfy all the ecological requirements of the non-breeding population, and it may require access to other SPAs or undesignated sites for certain activities, such as breeding and additional foraging locations when preferred foraging areas are unavailable due to disturbance, prey availability, or other factors".*

1.6.3 Integrity test: Step 2 - Assessment of adverse effects on site integrity

Overview

1.6.3.1 All of the sites for which further consideration was required as part of the integrity test: Step 2 require consideration in relation to the Morgan Generation Assets in-combination with other plans and projects. The integrity test: Step 1 concluded that there would be no adverse effects in relation to potential impacts associated with the Morgan Generation Assets alone.

Identification of plans and projects considered in-combination

1.6.3.2 The in-combination assessments take into account the potential impact associated with the Morgan Generation Assets together with the Morgan and Morecambe Offshore Wind Farms: Transmission Assets, the Morecambe Offshore Windfarm Generation Assets, and other projects and plans. The projects and plans selected as relevant to the in-combination assessment presented within this chapter are based upon the results of a screening exercise (see Volume 5, Annex 5.1: CEA screening matrix of the Environmental Statement). Each project has been considered on a case by case basis for screening in or out the in-combination assessment based upon data confidence, effect-receptor pathways and the spatial/temporal scales involved.

1.6.3.3 In-combination assessments have followed the methodology set out in Volume 1, Chapter 5: EIA methodology of the Environmental Statement. The in-combination assessment considers three scenarios:

- Scenario 1: Morgan Generation Assets plus Morgan and Morecambe Offshore Wind Farms: Transmission Assets
- Scenario 2: Morgan Generation Assets plus Morgan and Morecambe Offshore Wind Farms: Transmission Assets and the Morecambe Offshore Windfarm: Generation Assets
- Scenario 3: Morgan Generation Assets plus Morgan and Morecambe Offshore Wind Farms: Transmission Assets plus:
  - Tier 1:
    - 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 ongoing impact

– Tier 2

- Scoping report has been submitted and is in the public domain

– Tier 3

- Scoping report has not been submitted and is not in the public domain
- Identified in the relevant Development Plan
- Identified in other plans and programmes.

1.6.3.4 The specific projects, plans and activities screened into the in-combination assessment are outlined in Table 1.51. Tier 2 projects are only included in the following in-combination assessments if information is available to provide either a quantitative or qualitative assessment. In practice, this requires that an assessment has been published for Tier 2 projects. Without an assessment it is not possible to provide an indication as to the potential impact of the project as information such as baseline characterisation and project design are unavailable. The location of screened in projects and their proximity to the Morgan Generation Assets are further shown in Figure 1.3. Projects screened out are detailed within Volume 3, Annex 5.1 CEA screening annex of the Environmental Statement. Tier 3 projects have not yet reached a stage at which detailed information will be available and are therefore not considered in the cumulative assessments presented.

1.6.3.5 Some of the potential impacts considered within the Morgan Generation Assets alone assessment are specific to a particular phase of development (e.g. construction, operations and maintenance or decommissioning). Where the potential for cumulative effects with other plans or projects only have potential to occur where there is spatial or temporal overlap with the Morgan Generation Assets during certain phases of development, potential impacts associated with a certain phase may be omitted from further consideration where no plans or projects have been identified that have the potential for cumulative effects during this period.

1.6.3.6 In addition, some of the projects considered cumulatively only have potential to impact species during a specific season (e.g. breeding or non-breeding seasons). During the breeding season, projects within a species' foraging range from the SPA under consideration were considered as there is the potential for individuals to have connectivity to the Morgan Generation Assets and the other plans/ projects. Foraging ranges presented in Volume 4, Annex 5.1: Offshore ornithology baseline characterisation report of the Environmental Statement were used (Woodward *et al.*, 2019). Within the non-breeding season all developments within the BDMPS area relevant to a species (Furness, 2015) are included. As such, all 'breeding season' projects are also included within the non-breeding period given that the BDMPS areas defined by Furness (2015) are larger than the breeding foraging ranges. Additional projects not included within a breeding season assessment may be included within the non-breeding season assessment. Projects considered for each species during each season are presented within the in-combination assessments below.

Table 1.51: List of other projects and plans with potential for in-combination effects on offshore ornithological features.

Plan/project	Status	Details	Tier	Distance from the Morgan Generation Assets (km)	Date of construction (C)/operation (O)	Spatial overlap	Temporal overlap	Temporal overlap	Further assessment required? (Yes/No)
Walney Extension 4 offshore wind farm	Operational	40 8.25 MW wind turbines. Hub height 113 m. Rotor diameter 164 m.	Tier 1	9.9	O: 2018 to 2039	No	Yes	Operational activities for the Morgan Generation Assets may overlap with operational activities of the Walney Extension 4 offshore wind farm	Yes
Walney Extension 3 offshore wind farm	Operational	47 7 MW wind turbines. Hub height 111 m. Rotor diameter 154 m.	Tier 1	8.1	O: 2018 to 2039	No	Yes	Operational activities for the Morgan Generation Assets may overlap with operational activities of the Walney Extension 3 offshore wind farm	Yes
Walney 2 offshore wind farm	Operational	51 3.6 MW wind turbines. Hub height 84 m. Rotor diameter 107 m.	Tier 1	13.3	O: 2012 to 2032	No	Yes	Operational activities for the Morgan Generation Assets may overlap with operational activities of the Walney 2	Yes

Plan/project	Status	Details	Tier	Distance from the Morgan Generation Assets (km)	Date of construction (C)/operation (O)	Spatial overlap	Temporal overlap	Temporal overlap	Further assessment required? (Yes/No)
								offshore wind farm	
West of Duddon Sands offshore wind farm	Operational	108 3.6 MW wind turbines. Hub height 90 m Rotor diameter 120 m.	Tier 1	15.3	O: 2014 to 2033	No	Yes	Operational activities for the Morgan Generation Assets may overlap with operational activities of the West of Duddon Sands offshore wind farm	Yes
Walney 1 offshore wind farm	Operational	51 3.6 MW wind turbines. Hub height 84 m. Rotor diameter 107 m.	Tier 1	16.3	O: 2011 to 2032	No	Yes	Operational activities for the Morgan Generation Assets may overlap with operational activities of the Walney 1 offshore wind farm	Yes
Ormonde offshore wind farm	Operational	30 5 MW turbines. Hub Height 100 m. Rotor diameter 126 m.	Tier 1	24.4	O: 2012 to 2036	No	Yes	Operational activities for the Morgan Generation Assets may overlap with operational activities of the Ormonde	Yes

Plan/project	Status	Details	Tier	Distance from the Morgan Generation Assets (km)	Date of construction (C)/operation (O)	Spatial overlap	Temporal overlap	Temporal overlap	Further assessment required? (Yes/No)
								offshore wind farm	
Barrow offshore wind farm	Operational	30 3 MW turbines. Hub height 75 m. Rotor diameter 90 m.	Tier 1	30.0	O: 2006 to 2028	No	No	No	No – no temporal overlap
Awel y Môr Offshore Wind Farm	Submitted application	Greater than 350 MW (up to 50 turbines)	Tier 1	46.9	C: 2026 to 2029 O: 2030 to 2055	No	Yes	Construction and operational activities for the Morgan Generation Assets may overlap with construction and operational activities of the Awel y Môr Offshore Wind Farm	Yes
Gwynt y Môr Offshore Wind Farm	Operational	160 3.6 MW turbines. Hub height 98 m. Rotor diameter 107 m.	Tier 1	52.1	O: 2015 to 2033	No	Yes	Operational activities for the Morgan Generation Assets may overlap with operational activities of the Gwynt y Môr Offshore Wind Farm	Yes

Plan/project	Status	Details	Tier	Distance from the Morgan Generation Assets (km)	Date of construction (C)/operation (O)	Spatial overlap	Temporal overlap	Temporal overlap	Further assessment required? (Yes/No)
Burbo Bank Extension offshore wind farm	Operational	32 8 MW wind turbines. Hub height 105 m. Rotor diameter 160 m	Tier 1	56.0	O: 2017 to 2045	No	Yes	Operational activities for the Morgan Generation Assets may overlap with operational activities of the Burbo Bank Extension offshore wind farm	Yes
Rhyl Flats offshore wind farm	Operational	25 3.6 MW wind turbines. Hub height 80 m. Rotor diameter 107 m.	Tier 1	60.5	O: 2009 to 2027	No	No	No	No – no temporal overlap
North Hoyle offshore wind farm	Operational	30 2 MW wind turbines. Hub height 70 m. Rotor diameter 80 m.	Tier 1	61.1	O: 2004 to 2028	No	No	No	No – no temporal overlap
Burbo Bank offshore wind farm	Operational	23 3.6 MW wind turbines. Hub height 78 m. Rotor diameters 107 m.	Tier 1	61.6	O: 2007 to 2039	No	Yes	Operational activities for the Morgan Generation Assets may overlap with operational activities of the Burbo Bank offshore wind farm	Yes

Plan/project	Status	Details	Tier	Distance from the Morgan Generation Assets (km)	Date of construction (C)/operation (O)	Spatial overlap	Temporal overlap	Temporal overlap	Further assessment required? (Yes/No)
Robin Rigg offshore wind farm	Operational	58 3 MW wind turbines. Hub height 80 m Rotor diameter 90 m.	Tier 1	76.8	O: 2010 to 2035	No	No	Operational activities for the Morgan Generation Assets may overlap with operational activities of the Robin Rigg offshore wind farm	Yes
Arklow Bank Phase 1 offshore wind farm	Operational	Seven 3.6 MW wind turbines. Hub height 73.5 m. Rotor diameter 124 m.	Tier 1	176.2	O: 2004 to 2028	No	No	No	No – no temporal overlap
Rampion offshore wind farm	Operational	400 MW MW capacity. Hib height 80 m. Rotor diameter 112 m.	Tier 1	431.6	O: 2018 to 2039	No	Yes	Operational activities for the Morgan Generation Assets may overlap with operational activities of the Rampion offshore wind farm	Yes
Rampion 2 Offshore Wind Farm	Submitted application	Up to 1,200 MW capacity. Area - 270 km^2.	Tier 1	428.5	C: 2025 to 2028 O: 2029 to unknown	No	Yes	Construction and operational activities for the Morgan Generation Assets may	Yes

Plan/project	Status	Details	Tier	Distance from the Morgan Generation Assets (km)	Date of construction (C)/operation (O)	Spatial overlap	Temporal overlap	Temporal overlap	Further assessment required? (Yes/No)
								overlap with operational activities of Rampion 2	
Project Erebus	Submitted application	Floating Demonstration Projects. 96 MW capacity test and demonstration floating wind farm within the Celtic Sea. Seven to ten wind turbines.	Tier 1	289.9	C: 2025 O: 2026 to 2051	No	Yes	Construction and operational activities for the Morgan Generation Assets may overlap with operational activities of the Project Erebus.	Yes
Morgan and Morecambe Offshore Wind Farms Transmission Assets	Pre-application	n/a	Tier 2	0	C: 2026 to 2029 O: 2029 to 2065	Yes	Yes	Operational activities for the Morgan Generation Assets may overlap with operational activities of the Morgan Offshore Wind Project and Morecambe offshore wind farm transmission assets	Yes
Mona Offshore Wind Project	Submitted application	Up to 107 wind turbines	Tier 1	5.5	C: 2026 to 2029 O: 2030 to 2065	No	Yes	Operational activities for	Yes

Plan/project	Status	Details	Tier	Distance from the Morgan Generation Assets (km)	Date of construction (C)/operation (O)	Spatial overlap	Temporal overlap	Temporal overlap	Further assessment required? (Yes/No)
								the Mona Offshore Wind Project may overlap with operational activities of Morgan Generation Assets	
Morecambe Offshore Wind Farm: Generation Assets	Pre-application	480 MW capacity within an area of 497 km^2	Tier 2	11.2	C: 2026 to 2028 O: 2029 to 2064	No	Yes	Operational activities for the Morgan Generation Assets may overlap with operational activities of Morecambe generation offshore wind farm	Yes
White Cross offshore wind farm	Pre-application	100 MW test and demonstration floating wind farm within the Celtic Sea.	Tier 1	319.6	Unknown	No	Likely	Operational activities for the Morgan Generation Assets may overlap with operational activities of White Cross offshore wind farm	Yes
West of Orkney Windfarm	Submitted application	Offshore wind project	Tier 1	524.2	2027	No	Unknown	Operational activities for	Yes

Plan/project	Status	Details	Tier	Distance from the Morgan Generation Assets (km)	Date of construction (C)/operation (O)	Spatial overlap	Temporal overlap	Temporal overlap	Further assessment required? (Yes/No)
		comprising up to 125 wind turbines, 30 km from the coast of Orkney.						the Morgan Generation Assets may overlap with operational activities of the West of Orkney wind farm	

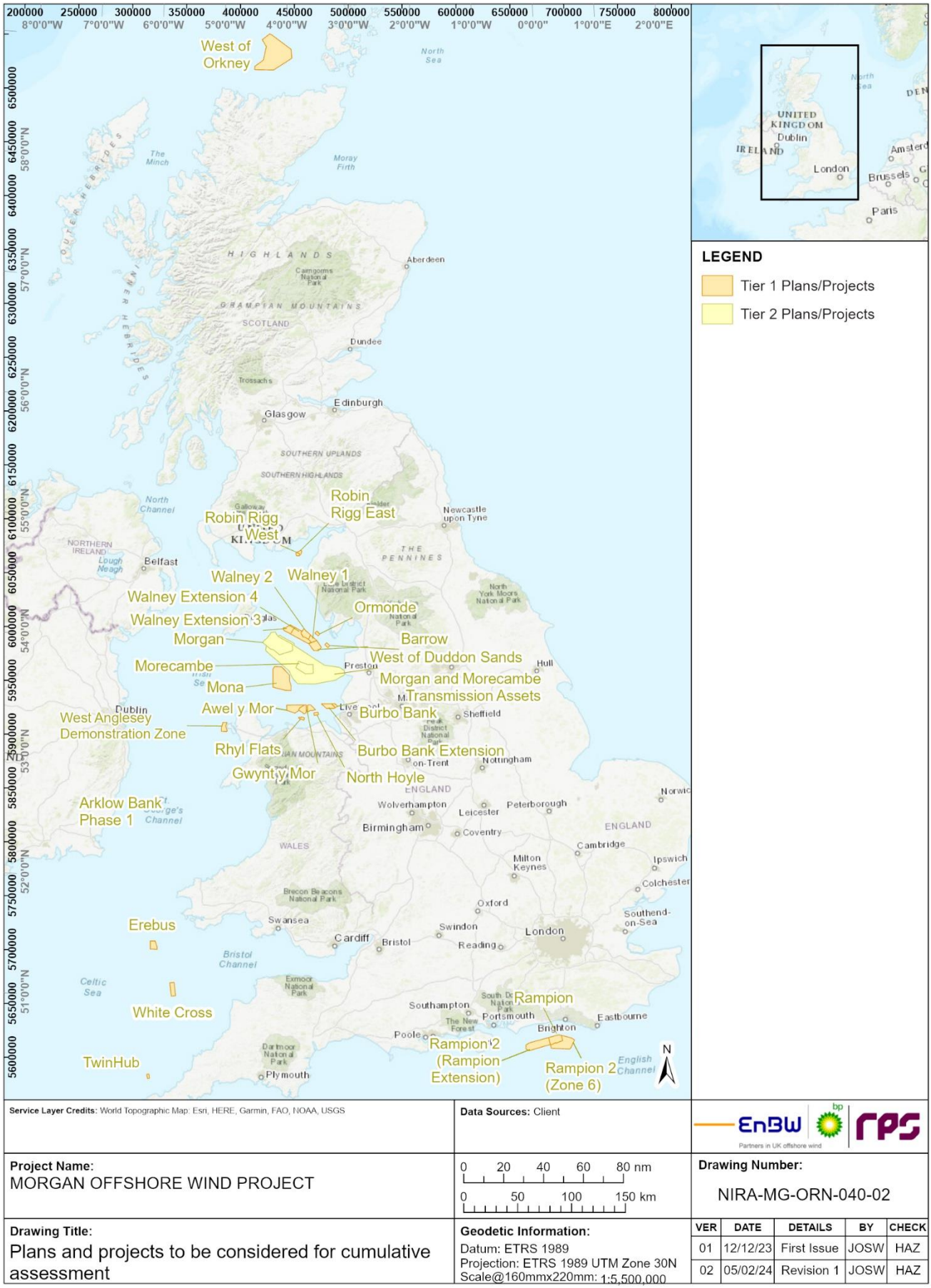

Figure 1.3: Location of other projects and plans considered for in-combination effects on SPAs with offshore ornithological features.

Methodology

1.6.3.7 In-combination assessments are presented in a series of tables (one for each potential in-combination impact), and consider the following:

- Scenario 1: Morgan Generation Assets together with the Morgan and Morecambe Offshore Wind Farms: Transmission Assets
- Scenario 2: Morgan Generation Assets together with the Morgan and Morecambe Offshore Wind Farms: Transmission Assets and the Morecambe Offshore Windfarm Generation Assets
- Scenario 3: Morgan Generation Assets together with the Morgan and Morecambe Offshore Wind Farms: Transmission Assets and Tier 1, Tier 2 and Tier 3: other relevant projects and plans.

1.6.3.8 The assessments presented are limited by the data available upon which to base the assessment. Due to the age of developments in the Irish Sea and surrounding areas which have the potential to have an in-combination impact upon receptors, few have comparable datasets upon which to base an assessment. However, every effort has been made to obtain quantitative estimates for both displacement and collision from project-specific documentation. For displacement impacts this includes following the approach applied by many previous offshore wind farms using any available population data to calculate mean-peak or peak population estimates for use in displacement analyses.

1.6.3.9 Additionally, older developments did not carry out certain quantitative impact assessments (e.g. displacement and/or collision risk) for species for which in-combination assessments with the Morgan Generation Assets are required due to limited data at the time of assessment on the species' behavioural response to the presence of offshore wind turbines. As such, the CEA is carried out using data from wind farms with available species data to do so. For projects in early stages (i.e. Tier 3) there was insufficient project information in the public domain to allow the effects to be reasonably understood and an in-combination assessment undertaken. Tier 3 projects have therefore not been included in the in-combination assessment below.

1.6.3.10 For the in-combination assessment, potential impacts from Tier 1 and Tier 2 projects have been assessed together to provide the most precautionary impact on the population. This remains so irrespective of whether any Tier 2 project included in this assessment does not get consented/built.

1.6.3.11 As part of the in-combination assessment all projects for which collision risk estimates or population estimates are available are considered. This approach is consistent with the approach taken for previous offshore wind farm projects in UK waters. In some cases, SPAs and Ramsar sites for which LSE has been identified in relation to potential impacts associated with the Morgan Generation Assets may not have been given detailed consideration in the assessments produced for other projects considered in-combination. This often means that apportioning values in the breeding season for some SPAs (and Ramsar) are not provided in project-specific documentation. Where this occurs available breeding season apportioning values from the nearest project for which a value is available have been applied. Where this approach has been followed it is identified above relevant tables. In non-breeding seasons, although apportioning values may not have been calculated for SPAs in project-specific documentation for projects considered in-combination, apportioning values for these seasons are readily calculated from Furness (2015) and generally the same as those used for the Morgan Generation Assets.

Impacts considered within the assessment

1.6.3.12 All potential impacts considered for the Morgan Generation Assets alone, as set out in section 1.5.3, have been considered in the in-combination assessment. On this basis, the potential impacts identified for assessment as part of the Volume 2, Chapter 5: Offshore Ornithology of the Environmental Statement (Document Reference F2.5), and which have been brought forward for consideration in the in-combination assessment of the HRA Stage 2 ISAA Report are:

- During the operations and maintenance phase
  - Disturbance and displacement from airborne sound and presence of vessels and infrastructure
  - Collison risk.

Disturbance and displacement from airborne sound and presence of vessels and infrastructure

1.6.3.13 There is potential for in-combination displacement impacts as a result of operational activities associated with the Morgan Generation Assets in-combination with other developments.

1.6.3.14 During the operations and maintenance phase, the presence of offshore wind turbines has the potential to directly disturb and displace seabirds that would normally reside within and around the area of sea where offshore wind farms are located. Displacement may contribute to individual birds experiencing fitness consequences, which at an extreme level could lead to the mortality of individuals. In-combination displacement impacts therefore have the potential to lead to effects on a wider scale.

1.6.3.15 The in-combination impacts are presented as displacement matrices ranging from 1% to 100% mortality and 10% to 100% displacement depending on the species and the range of displacement rates considered in the project alone assessment. Each cell presents potential in-combination bird mortality following displacement from the Morgan Generation Assets in-combination with other offshore wind farm projects during each season. Light blue highlighted cells are based on the displacement and mortality rates used in the project alone displacement assessment Volume 4, Annex 10.2: Offshore ornithology displacement assessment of the Environmental Statement.

1.6.3.16 With regards to vessels in the Morgan Generation Assets, there is no method to quantify the displacement impact of the activities due to their local and temporary nature. An Offshore Environmental Management Plan that will contain measures to minimise disturbance to rafting birds from transiting vessels will be secured as a requirement of the draft DCO (Document Reference C1) /marine licences. It is therefore expected that potential impacts of vessels on seabirds are negligible due to the management of vessel traffic.

Collision risk

1.6.3.17 There are no collision risk impacts associated with the Morgan and Morecambe Offshore Wind Farms: Transmission Assets and therefore only Scenarios 2 and 3 are relevant to the in-combination assessment of collision risk.

1.6.3.18 The Morgan Generation Assets, together with other offshore wind farms in the Irish Sea, may contribute to in-combination collision risk, in the event the operations phases of different projects overlap. Seabirds are highly mobile, therefore they can encounter different offshore wind farms, and be at risk of collisions, across large areas.

1.6.3.19 As stated, data used when assessing cumulative collision risk is based on published information produced by the respective project developers. As such, the input parameters (e.g. avoidance rates) and the collision risk model used (e.g. deterministic) may vary from those put forward in this report.

In-combination disturbance and displacement from airborne sound, underwater sound and presence of vessels and infrastructure

1.6.3.20 The assessment for in-combination disturbance and displacement from airborne sound and presence of vessels and infrastructure is presented for the operations and maintenance phase below for the SPAs and associated qualifying feature listed in Table 1.52.

Table 1.52: European sites and relevant offshore ornithological features from which the potential for an adverse effect could not be ruled out in relation to in-combination disturbance and displacement from airborne sound, underwater sound and presence of vessels and infrastructure.

European site	Offshore ornithological features
Flannan Isles SPA	Guillemot *Uria aalge*
	Breeding seabird assemblage

Operations and maintenance phase

1.6.3.21 Airborne sound, underwater sound, the presence of vessels and the presence of offshore infrastructure may disturb seabirds from offshore foraging or non-foraging areas (e.g. rafting, moulting) in the short-term, causing changes in behaviour or displacement from the affected areas. Temporary disturbance/displacement may lead to a reduction in foraging opportunities or increased energy expenditure, resulting in decreased survival rates or productivity in the population.

1.6.3.22 The MDS considered for the assessment of potential impacts on offshore ornithological features from in-combination disturbance and displacement from airborne sound, underwater sound and presence of vessels and infrastructure during all phases is presented in Table 1.53. This MDS table is based on the MDS for the Morgan Generation Assets project alone in in Volume 2, Chapter 5: Offshore Ornithology chapter of the Environmental Statement (Document Reference F2.5).

Table 1.53: Maximum design scenario considered for the assessment of potential impacts on offshore ornithological features from disturbance and displacement from airborne sound, underwater sound and presence of vessels and infrastructure during all phases.

Phase	Maximum design scenario	Justification
Operations and maintenance phase	Disturbance and displacement from presence of operations wind turbines and associated operations and maintenance activity, including increased vessel, helicopter and inspection drone activity: • Presence of up to 96 operating wind turbines and up to four OSPs occupying the Morgan Array Area of up to 280 km^2 • Minimum spacing of 1400 m between wind turbines • Up to 719 operations and maintenance vessel movements (return trips) each year • Up to a total of 16 operations and maintenance vessels on site at any one time • Up to 639 helicopter return trips per year with up to seven on site at any one time • Up to 214 inspection drones return trips per year (operated from vessel, two inspections per wind turbine per year as a maximum) • Operational lifetime of up to 35 years.	Represents the maximum density of wind turbines and structures across the maximum Morgan Array Area that would cause greatest extent of disturbance and displacement to birds or the greatest duration of impact. Represents the maximum underwater sound impacts from impact piling for each of the relevant infrastructure foundation options. Represents the maximum number of vessel and helicopter movements that would cause greatest visual and noise disturbance and displacement to birds from the Morgan Array Area.

Flannan Isles SPA

Guillemot

1.6.3.23 Based on the mean-maximum foraging range +1SD of guillemot (Woodward *et al*., 2019) from the Flannan Isles SPA, there are no projects within foraging range of guillemot from the SPA during the breeding season. In the non-breeding season, there are numerous projects within the BDMPS of relevance to the species (Furness, 2015).

1.6.3.24 Table 1.54 presents the seasonal population estimates for those projects for which quantified estimates can be obtained. These values represent the number of guillemot from the Flannan Isles SPA with apportioning based on the apportioning values calculated using data from Furness (2015). There are a number of projects for which there are no, or limited, data on the number of guillemot predicted to be displaced. For some of these projects qualitative assessments were conducted and these are summarised in Table 1.55.

Table 1.54: Cumulative abundance for guillemot at the Flannan Isles SPA for projects considered in-combination in relation to disturbance and displacement from projects.

Project	Seasonal apportioning values		Seasonal abundance values	
	Breeding	Non-breeding	Breeding	Non-breeding
Awel y Môr	No connectivity	0.016	-	47.7
Burbo Bank Extension	No connectivity	0.016	-	25.5
Erebus	No connectivity	0.016	-	463.5
Mona Offshore Wind Project	No connectivity	0.016	-	61.4
Morecambe Offshore Wind Farm: Generation Assets	No connectivity	0.016	-	125.1
Morgan Generation Assets	No connectivity	0.016	-	62.5
Twinhub	No connectivity	0.016	-	3.6
Walney 3 + 4	No connectivity	0.016	-	31.5
West of Orkney	No connectivity	0.016	-	71.9
White Cross	No connectivity	0.016	-	17.3
Annual totals				
Scenario 2			**187.6**	
Scenario 3			**910.1**	

Table 1.55: Qualitative assessment of projects considered cumulatively with the Morgan Generation Assets for which quantitative consideration of displacement impacts was not undertaken in project-specific documentation for guillemot.

Project	Connectivity	Reason for estimates being unavailable	Qualitative assessment	Final conclusion
Tier 1				
Burbo Bank (Seascape Energy Ltd., 2002)	Non-breeding season only. Apportioning value = 1.6%	Disturbance impacts considered qualitatively	Surveys of the project comprised aerial and boat-based surveys both of which were undertaken during winter months (aerial = November to April and boat-based = December and February). Aerial surveys covered a large area encompassing the Liverpool Bay SPA with boat-based surveys covering the project area. The surveys were undertaken to provide abundance and distribution data for those species considered to be of most importance, namely common scoter and red-throated diver. Guillemots were recorded in all months during which aerial surveys were undertaken however, there is no information on the numbers recorded within the wind farm. During boat-based surveys, which were undertaken across a much smaller area, numbers of guillemot were far smaller with a highest count of 34 birds.	Low levels of disturbance were predicted resulting in a conclusion of a negligible magnitude and a very low significance on an EIA basis. The guillemot feature of the Flannan Isles SPA was not specifically considered in the assessments presented.
Walney 1 & 2 (RPS, 2006a)	Non-breeding season only. Apportioning value = 1.6%	Disturbance impacts considered qualitatively	Site-specific surveys included boat-based surveys undertaken across an area of 512 km^2 in the vicinity of the project between May 2004 and September 2005. The project also utilised survey data collected by regional aerial surveys, undertaken across the NW3 aerial survey area between 2002 and 2006 and radar survey data collected between 01 October and 29 October 2005. The peak population of guillemot recorded in the project area plus 2 km buffer during aerial surveys was 30 birds with a peak count of 391 auk species in the same area. In boat-based surveys the equivalent populations were 1,256 guillemot and 65 auk species.	It was considered that the wind farm area did not represent a favoured foraging habitat and the magnitude of any impact was considered to be low. The species was considered to be of medium importance (termed sensitivity in the Walney 1 & 2 assessments). The overall significance of impacts associated with the project was considered to be low on an EIA basis. The guillemot feature of the Flannan Isles SPA was not specifically considered in the assessments presented.

Project	Connectivity	Reason for estimates being unavailable	Qualitative assessment	Final conclusion
Gwynt y Môr (RWE Group and Npower Renewables, 2005)	Non-breeding season only. Apportioning value = 1.6%	Disturbance impacts considered qualitatively	Site-specific surveys undertaken in support of the project included boat-based surveys undertaken between February 2003 and March 2005. Surveys between February 2003 and February 2004 covered a large area along the Welsh coast incorporating the project area with surveys between March 2004 and March 2005 more focussed on the project area. The assessment also used data from aerial surveys undertaken between 2000 and 2005 which were targeted at recording common scoter. The majority of guillemot identified to species level during aerial surveys occurred in July and August. Based on the aerial survey data collected during the November 2004 survey, 32 guillemot were estimated to be present in the wind farm area. Birds were seen in or around the wind fam area in most months during which boat-based survey were undertaken with fewer observed between June and September.	It was considered that displacement (termed avoidance of turbines in the assessments conducted) would result in an impact of low significance for auk species on an EIA basis. The guillemot feature of the Flannan Isles SPA was not specifically considered in the assessments presented.
West of Duddon Sands (RPS, 2006b)	Non-breeding season only. Apportioning value = 1.6%	Disturbance impacts considered qualitatively	Site-specific surveys included boat-based surveys undertaken across an area of 512 km^2 in the vicinity of the project between May 2004 and September 2005. The project also utilised survey data collected by regional aerial surveys, undertaken across the NW3 aerial survey area between 2002 and 2006 and radar survey data collected between01 October and 29 October 2005. The peak population of guillemot recorded in the project area plus a 2 km buffer during boat-based surveys was 1,230 birds with an additional 40 auk species recorded. Based on the distribution of guillemot it was considered that the wind farm was not a favoured foraging area.	The magnitude of impacts was considered to be low. Guillemot was considered to be of medium importance (termed sensitivity in the assessments for the project). The significance of all impacts was considered to be low on an EIA basis. The guillemot feature of the Flannan Isles SPA was not specifically considered in the assessments presented.

Project	Connectivity	Reason for estimates being unavailable	Qualitative assessment	Final conclusion
Ormonde (Ecology Consulting, 2005)	Non-breeding season only. Apportioning value = 1.6%	Disturbance impacts considered qualitatively	Site-specific surveys included boat-based surveys undertaken monthly between May 2004 and April 2005. In addition, three aerial surveys were conducted during the summer of 2004 with four further aerial surveys in the winter of 2004/5. The peak population of guillemot recorded in the wind farm plus a 2 km buffer during boat-based surveys was 238 birds. During aerial surveys the equivalent population was 0, although 1,086 auk species were recorded. Peak numbers occurred in autumn months (September or November). The species was considered to be regionally important in the context of the assessments conducted.	The magnitude of the effect for guillemot was considered to be low with a low significance on an EIA basis. The guillemot feature of the Flannan Isles SPA was not specifically considered in the assessments presented.
Robin Rigg (Natural Power, 2002)	Non-breeding season only. Apportioning value = 1.6%	Disturbance impacts considered qualitatively.	The project utilised site-specific boat-based surveys to characterise the baseline environment. Two surveys were completed in each month from May 2001 for one year. In addition, aerial surveys were undertaken from November 2001 on a monthly basis through winter and spring to verify the distribution and abundance of seaduck. The mean count of guillemot during boat-based surveys in the wind farm was 7.9 (and 0.4 for auk species) birds with a peak of 39 birds (3 for auk species). Guillemot was considered to be of local importance based on the populations recorded in the wind farm. Aerial surveys undertaken in the non-breeding season recorded a maximum of two auks.	The magnitude of the effect was considered to be low with a low significance. The guillemot feature of the Flannan Isles SPA was not specifically considered in the assessments presented.

Scenario 1: Morgan Generation Assets together with the Morgan and Morecambe Offshore Wind Farms: Transmission Assets

1.6.3.25 Connectivity was identified between the Flannan Isles SPA and the Morgan and Morecambe Offshore Wind Farms: Transmission Assets in the non-breeding season only. The screening report for the Morgan and Morecambe Offshore Wind Farms: Transmission Assets concluded that the area affected by the project would represent a negligible proportion of the area available to seabirds in the non-breeding season with many species migrating to areas outside of the Irish Sea. It is considered highly unlikely that the project area will provide a material contribution to any existing impact in the non-breeding season and therefore LSE is discounted for any SPA for which potential connectivity has been identified in the non-breeding seasons only. There is therefore considered to be no change to the assessments conducted in the Integrity test: Step 1 for the Morgan Generation Assets alone and a conclusion of no adverse effect on the integrity of the guillemot feature of the Flannan Isles SPA is reached. Further information on specific conservation objectives is provided in Table 1.58.

Scenario 2: Morgan Generation Assets together with the Morecambe Offshore Windfarm Generation Assets and the Morgan and Morecambe Offshore Wind Farms: Transmission Assets

1.6.3.26 The total population of birds present at the Morgan Generation Assets and Morecambe Generation Assets apportioned to the guillemot population at the Flannan Isles SPA is 187.6 birds. An assessment against the SPA population is provided in Table 1.56. The blue shading in this matrix indicates where the 1% baseline mortality of the guillemot population at the Flannan Isles SPA is surpassed. The purple outline indicates the range of displacement and mortality rates considered based on JNCC *et al.* (2022) guidance.

1.6.3.27 The JNCC (2022) guidance provides an approach to defining displacement and mortality rate ranges for use in displacement assessments which has been followed in the above mentioned displacement matrices but also indicates that projects should seek and present emerging sources of empirical evidence to provide support for displacement assessments. The most recent appraisal of displacement rates for guillemot was undertaken by APEM (2022). This review concluded that a displacement rate of 50% and mortality rate of 1% was appropriate for use in relation to displacement assessments being undertaken for the Hornsea Four offshore wind farm. The review suggests that in areas of high abundance, displacement is limited and postulates that this may be due to higher importance of the underlying habitat to birds meaning birds are more likely to tolerate the presence of structures in the area. For areas with low abundance, displacement rates were increased and the review postulates that this may be that birds are able to forage in other areas as competition between birds is reduced. The conclusions drawn in this review have however been questioned (Natural England, 2022).

1.6.3.28 Monitoring of impacts at projects in the Irish Sea, indicate weak attraction/weak avoidance of auk species (APEM, 2022). The most recent study on displacement at the Beatrice offshore wind farm utilising an approach investigating the distribution of seabirds in relation to turbine locations suggested that auk species did not avoid turbines (MacArthur Green, 2023).

1.6.3.29 Based on the information presented it is considered that the displacement mortality for guillemot will not surpass the 1% threshold of baseline mortality of the SPA population. Based on the approach taken in the integrity test: Step 1 this is not considered to represent an adverse effect on the site integrity of the guillemot feature of the Flannan Isles SPA.

Table 1.56: In-combination displacement analysis for the guillemot feature of the Flannan Isles SPA in the non-breeding season – (Scenario 2).

Guillemot (Flannan Isles SPA)		Mortality rate (%)												
		1	2	5	10	20	30	40	50	60	70	80	90	100
Displacement rate (%)	10	0	0	1	2	4	6	8	9	11	13	15	17	19
	15	0	1	1	3	6	8	11	14	17	20	23	25	28
	20	0	1	2	4	8	11	15	19	23	26	30	34	38
	30	1	1	3	6	11	17	23	28	34	39	45	51	56
	35	1	1	3	7	13	20	26	33	39	46	53	59	66
	40	1	2	4	8	15	23	30	38	45	53	60	68	75
	50	1	2	5	9	19	28	38	47	56	66	75	84	94
	60	1	2	6	11	23	34	45	56	68	79	90	101	113
	70	1	3	7	13	26	39	53	66	79	92	105	118	131
	80	2	3	8	15	30	45	60	75	90	105	120	135	150
	90	2	3	8	17	34	51	68	84	101	118	135	152	169
	100	2	4	9	19	38	56	75	94	113	131	150	169	188

Scenario 3: Tier 1, Tier 2 and Tier 3: Morgan Generation Assets together with the Morgan and Morecambe Offshore Wind Farms: Transmission Assets and other relevant projects and plans.

1.6.3.30 The total population of birds present at the Morgan Generation Assets and other projects apportioned to the guillemot population at the Flannan Isles SPA is 910.1 birds. An assessment against the SPA population is provided in Table 1.57. The blue shading in this matrix indicates where the 1% baseline mortality of the guillemot population at the Flannan Isles SPA is surpassed. The purple outline indicates the range of displacement and mortality rates considered based on JNCC *et al.* (2022) guidance.

1.6.3.31 The JNCC (2022) guidance provides an approach to defining displacement and mortality rate ranges for use in displacement assessments which has been followed in the displacement matrix above but also indicates that projects should seek and present emerging sources of empirical evidence to provide support for displacement assessments. Paragraphs 1.5.3.8 to 1.5.3.12 provide a review of evidence for deriving displacement and mortality rates for guillemot. The most recent appraisal of displacement rates for guillemot was undertaken by APEM (2022). This review concluded that a displacement rate of 50% and mortality rate of 1% was appropriate for use in relation to displacement assessments being undertaken for the Hornsea Four offshore wind farm. The review suggests that in areas of high abundance, displacement is limited and postulates that this may be due to higher importance of the underlying habitat to birds meaning birds are more likely to tolerate the presence of structures in the area. For areas with low abundance, displacement rates were increased and the review postulates that this may be that birds are able to forage in other areas as competition between birds is reduced. The conclusions drawn in this review have however been questioned (Natural England, 2022).

1.6.3.32 Monitoring of impacts at projects in the Irish Sea, indicate weak attraction/weak avoidance of auk species (APEM, 2022). The most recent study on displacement at the Beatrice offshore wind farm utilising an approach investigating the distribution of seabirds in relation to turbine locations suggested that auk species did not avoid turbines (MacArthur Green, 2023).

1.6.3.33 The use of a 50% displacement rate and 1% mortality rate results in an in-combination impact of 4.6 birds/annum. In addition to this impact, consideration is also given to underwater collision impacts associated with the Morlais tidal project. The predicted impact associated with this project apportioned to the Flannan Isles SPA is 0.2 birds/annum. This provides a total in-combination impact of 4.8 birds/annum. This represents more than a 1% increase (1.03%) in the baseline mortality of the SPA population (1.03%).

1.6.3.34 The Flannan Isles SPA is located over 450 km from the closest project considered in the in-combination assessment. The Cape Wrath SPA is located over 400 km from the closest project considered in the in-combination assessment. The current approach to apportioning in the non-breeding season assumes that birds within the BDMPS areas defined in Furness (2015) are equally distributed. This therefore assumes that birds from northern Scotland are as likely to occur in the Celtic Sea as birds from colonies in the Celtic Sea. Recent work, tracking guillemot populations at Colonsay, Treshnish, Whinnyfold and the Isle of May during the non-breeding season has provided information on the non-breeding season movements and distribution of guillemot from these colonies (Buckingham *et al.,* 2022). Although the locations highlighted in Buckingham *et al.* (2022) are broadly comparable with previous ring recovery data they provide much more detail on non-breeding movements. Buckingham *et al.* (2022) recorded more northerly core distributions in guillemots during moult and mid-winter, and distributions were more constrained than in previous studies indicating that the assumption of equal distribution throughout the BDMPS areas defined by Furness (2015) represent considerable over-estimates in areas of sea located away from the colony of interest.

1.6.3.35 Birds from Colonsay, which is located to the south of the Flannan Isles, showed some connectivity with the Irish Sea in August but then very little for the rest of the non-breeding season. The core colony distributions for birds from the Treshnish Isles, which is also located to the south of Cape Wrath but to the north of Colonsay were outwith the Irish Sea. As the Flannan Isles are located to the north of Treshnish it is considered unlikely that birds from this SPA will show any appreciable connectivity with the Irish Sea and the in-combination impact is therefore significantly lower than predicted in this report. It should be noted that the Buckingham *et al.* (2022) study tracks breeding birds, which, from the colonies from which birds were tracked, appear to show limited connectivity with the Irish Sea, whereas site-specific surveys undertaken to characterise the baseline at the Morgan Generation Assets also include non-breeding birds (immature and sabbatical birds) and breeding birds from local colonies (although note these are limited in number in the Irish Sea

1.6.3.36 Based on the information presented it is considered that the displacement mortality for guillemot will not surpass the 1% threshold of baseline mortality for the SPA population. Based on the approach taken in the integrity test: Step 1 this is not considered to represent an adverse effect on the site integrity of the guillemot feature of the Flannan Isles SPA.

Table 1.57: In-combination displacement analysis for the guillemot feature of the Flannan Isles SPA in the non-breeding season – (Scenario 3).

Guillemot (Flannan Isles SPA)		Mortality rate (%)												
		1	2	5	10	20	30	40	50	60	70	80	90	100
Displacement rate (%)	10	1	2	5	9	18	27	36	46	55	64	73	82	91
	15	1	3	7	14	27	41	55	68	82	96	109	123	137
	20	2	4	9	18	36	55	73	91	109	127	146	164	182
	30	3	5	14	27	55	82	109	137	164	191	218	246	273
	35	3	6	16	32	64	96	127	159	191	223	255	287	319
	40	4	7	18	36	73	109	146	182	218	255	291	328	364
	50	5	9	23	46	91	137	182	228	273	319	364	410	455
	60	5	11	27	55	109	164	218	273	328	382	437	491	546
	70	6	13	32	64	127	191	255	319	382	446	510	573	637
	80	7	15	36	73	146	218	291	364	437	510	582	655	728
	90	8	16	41	82	164	246	328	410	491	573	655	737	819
	100	9	18	46	91	182	273	364	455	546	637	728	819	910

1.6.3.37 An assessment against the conservation objectives for the guillemot feature of the Flannan Isles SPA is provided in Table 1.58. These conclusions are also considered applicable to the breeding seabird assemblage of the SPA.

Table 1.58: Conclusions against the conservation objectives of the guillemot qualifying feature of the Flannan Isles SPA for in-combination disturbance and displacement from airborne sound, underwater sound and presence of vessels and infrastructure.

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Tier 1, Tier 2, Tier 3 projects
The extent and distribution of the habitats of the qualifying features are maintained **The structure and function of the habitats of the qualifying features are maintained** **The supporting processes on which the habitats of the qualifying features rely are maintained**	• Potential impacts from the Morgan Generation Assets on the guillemot feature of the Flannan Isles SPA will only occur in the non-breeding season. The Morgan Generation Assets occupy an area of 280 km^2. The available area of habitat available for guillemot from the Flannan Isles SPA to utilise in the non-breeding season is, based on information in Furness (2015), considered to extend from the north coast of Scotland to the south coast of Cornwall. However, recent tracking of guillemot from colonies in Scottish waters suggests that guillemot do not utilise areas as large as those associated with the BDMPS areas in Furness (2015). The Morgan Generation Assets therefore represent a negligible proportion of the habitat available to guillemot from the Flannan Isles SPA. • Potential impacts from the Morgan and Morecambe Offshore Wind Farms: Transmission Assets on the guillemot feature of the Flannan Isles SPA will only occur in the non-breeding season. The PEIR assessment for the Morgan and Morecambe Offshore Wind Farms: Transmission Assets concluded that the area affected by the project would represent a negligible proportion of the	• Potential impacts from the Morgan Generation Assets on the guillemot feature of the Flannan Isles SPA will only occur in the non-breeding season. The Morgan Generation Assets occupy an area of 280 km^2. The available area of habitat available for guillemot from the Flannan Isles SPA to utilise in the non-breeding season is, based on information in Furness (2015), considered to extend from the north coast of Scotland to the south coast of Cornwall. However, recent tracking of guillemot from colonies in Scottish waters suggests that guillemot do not utilise areas as large as those associated with the BDMPS areas in Furness (2015). The Morgan Generation Assets therefore represent a negligible proportion of the habitat available to guillemot from the Flannan Isles SPA. • Potential impacts from the Morecambe Generation Assets on the guillemot feature of the Flannan Isles SPA will only occur in the non-breeding season. The Morecambe Generation Assets occupy an area of 126 km^2. The available area of habitat available for guillemot from the Flannan Isles SPA to utilise in the non-breeding season is, based on information in Furness (2015), considered to extend from the north coast of Scotland to the south coast of Cornwall. However, recent tracking of guillemot from	• Potential impacts from the Morgan Generation Assets on the guillemot feature of the Flannan Isles SPA will only occur in the non-breeding season. The Morgan Generation Assets occupy an area of 280 km2. The available area of habitat available for guillemot from the Flannan Isles SPA to utilise in the non-breeding season is, based on information in Furness (2015), considered to extend from the north coast of Scotland to the south coast of Cornwall. However, recent tracking of guillemot from colonies in Scottish waters suggests that guillemot do not utilise areas as large as those associated with the BDMPS areas in Furness (2015). The Morgan Generation Assets therefore represent a negligible proportion of the habitat available to guillemot from the Flannan Isles SPA. • A further 13 projects may act in-combination with the Morgan Generation Assets to impact the guillemot feature of the Flannan Isles SPA. Impacts from these projects on this feature will only occur in the non-breeding season. It is considered that the total area represented by these projects represents only a small proportion of the habitat available to guillemot from the Flannan Isles SPA in the non-breeding season. Recent tracking of guillemot from colonies in Scottish waters suggests that

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Tier 1, Tier 2, Tier 3 projects
	area available to guillemot in the non-breeding season. • There is considered to be no change to the assessments conducted in the Integrity test: Step 1 for the Morgan Generation Assets alone and a conclusion of no adverse effect on the integrity of the guillemot feature of the Flannan Isles SPA is reached. • Guillemot is sensitive to disturbance and displacement impacts (Wade *et al.,* 2016) however, there is no effect of airborne sound, underwater sound, and presence of vessels on the supporting habitats (and food availability). Therefore, disturbance and displacement from airborne sound and presence of vessels and infrastructure during the operation and maintenance phase will not prevent the extent and distribution, structure and function or the supporting processes of the habitats of the qualifying features from being maintained or restored.	colonies in Scottish waters suggests that guillemot do not utilise areas as large as those associated with the BDMPS areas in Furness (2015). The Morecambe Generation Assets therefore represent a negligible proportion of the habitat available to guillemot from the Flannan Isles SPA. • Potential impacts from the Morgan and Morecambe Offshore Wind Farms: Transmission Assets on the guillemot feature of the Flannan Isles SPA will only occur in the non-breeding season. The PEIR assessment for the Morgan and Morecambe Offshore Wind Farms: Transmission Assets concluded that the area affected by the project would represent a negligible proportion of the area available to guillemot in the non-breeding season. • Guillemot is sensitive to disturbance and displacement impacts (Wade *et al.,* 2016) however, there is no effect of airborne sound, underwater sound, and presence of vessels on the supporting habitats (and food availability). Therefore, disturbance and displacement from airborne sound and presence of vessels and infrastructure during the operation and maintenance phase will not prevent the extent and distribution, structure and function or the supporting processes of the habitats of the qualifying features from being maintained or restored.	guillemot do not utilise areas as large as those associated with the BDMPS areas in Furness (2015). • Guillemot is sensitive to disturbance and displacement impacts (Wade et al., 2016) however, there is no effect of airborne sound, underwater sound, and presence of vessels on the supporting habitats (and food availability). Therefore, disturbance and displacement from airborne sound and presence of vessels and infrastructure during the operation and maintenance phase will not prevent the extent and distribution, structure and function or the supporting processes of the habitats of the qualifying features from being maintained or restored.

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Tier 1, Tier 2, Tier 3 projects
The population of each of the qualifying features are maintained	• Potential impacts from the Morgan Generation Assets on the guillemot feature of the Flannan Isles SPA will only occur in the non-breeding season. Recent tracking of guillemot from colonies in Scottish waters suggests that guillemot do not utilise areas as large as those associated with the BDMPS areas in Furness (2015). The predicted impact from the Morgan Generation Assets alone is therefore considered to represent less than a 1% increase in the baseline mortality of the SPA population. • Potential impacts from the Morgan and Morecambe Offshore Wind Farms: Transmission Assets on the guillemot feature of the Flannan Isles SPA will only occur in the non-breeding season. The PEIR assessment for the Morgan and Morecambe Offshore Wind Farms: Transmission Assets concluded that the area affected by the project would represent a negligible proportion of the area available to guillemot in the non-breeding season. • There is considered to be no change to the assessments conducted in the Integrity test: Step 1 for the Morgan Generation Assets alone and a conclusion of no adverse effect on the integrity of the guillemot feature of the Flannan Isles SPA is reached. • Guillemot is sensitive to disturbance and displacement impacts (Wade *et al.,* 2016)	• Potential impacts from the Morgan Generation Assets, and Morecambe Generation Assets on the guillemot feature of the Flannan Isles SPA will only occur in the non-breeding season. Recent tracking of guillemot from colonies in Scottish waters suggests that guillemot do not utilise areas as large as those associated with the BDMPS areas in Furness (2015). The predicted impact is therefore considered to represent less than a 1% increase in the baseline mortality of the SPA population. • Potential impacts from the Morgan and Morecambe Offshore Wind Farms: Transmission Assets on the guillemot feature of the Flannan Isles SPA will only occur in the non-breeding season. The PEIR assessment for the Morgan and Morecambe Offshore Wind Farms: Transmission Assets concluded that the area affected by the project would represent a negligible proportion of the area available to guillemot in the non-breeding season. • Guillemot is sensitive to disturbance and displacement impacts (Wade et al., 2016) however, the magnitude of predicted impacts apportioned to the SPA will not exceed the 1% threshold of baseline mortality. Therefore, disturbance and displacement from airborne sound and presence of vessels and infrastructure during the operation and maintenance phase will not prevent the population of	• Potential impacts from the Morgan Generation Assets, and all other projects considered in-combination on the guillemot feature of the Flannan Isles SPA will only occur in the non-breeding season. Recent tracking of guillemot from colonies in Scottish waters suggests that guillemot do not utilise areas as large as those associated with the BDMPS areas in Furness (2015). The predicted impact is therefore considered to represent less than a 1% increase in the baseline mortality of the SPA population. • Guillemot is sensitive to disturbance and displacement impacts (Wade et al., 2016) however, the magnitude of predicted impacts apportioned to the SPA will not exceed the 1% threshold of baseline mortality of the appropriate reference population for the SPA. Therefore, disturbance and displacement from airborne sound and presence of vessels and infrastructure during the operation and maintenance phase will not prevent the population of guillemot at the SPA from being maintained or restored.

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Tier 1, Tier 2, Tier 3 projects
	however, the magnitude of predicted impacts apportioned to the SPA will not exceed the 1% threshold of baseline mortality. Therefore, disturbance and displacement from airborne sound and presence of vessels and infrastructure during the operation and maintenance phase will not prevent the population of guillemot at the SPA from being maintained or restored.	guillemot at the SPA from being maintained or restored.	
The distribution of the qualifying features within the site are maintained	• Impacts associated with both projects on the guillemot feature of the SPA will occur in the non-breeding season only. There is therefore no impact on the distribution of guillemot within the SPA. • Therefore, disturbance and displacement from airborne sound and presence of vessels and infrastructure during the operation and maintenance phase will not prevent the distribution of guillemot within the SPA from being maintained or restored.	• Impacts associated with all projects on the guillemot feature of the SPA will occur in the non-breeding season only. There is therefore no impact on the distribution of guillemot within the SPA. • Therefore, disturbance and displacement from airborne sound and presence of vessels and infrastructure during the operation and maintenance phase will not prevent the distribution of guillemot within the SPA from being maintained or restored.	• Impacts associated with all projects on the guillemot feature of the SPA will occur in the non-breeding season only. There is therefore no impact on the distribution of guillemot within the SPA. • Therefore, disturbance and displacement from airborne sound and presence of vessels and infrastructure during the operation and maintenance phase will not prevent the distribution of guillemot within the SPA from being maintained or restored.
Conclusion	**Adverse effects on the guillemot qualifying feature, which undermine the conservation objectives of the Flannan Isles SPA, will not occur as a result of disturbance and displacement from airborne sound, underwater sound and presence of vessels and infrastructure in-combination with the Morgan and Morecambe Offshore Wind Farms: Transmission Assets**	**Adverse effects on the guillemot qualifying feature, which undermine the conservation objectives of the Flannan Isles SPA, will not occur as a result of disturbance and displacement from airborne sound, underwater sound and presence of vessels and infrastructure in-combination with the Morgan and Morecambe Offshore Wind Farms: Transmission Assets and Morecambe Offshore Windfarm Generation Assets.**	**Adverse effects on the guillemot qualifying feature, which undermine the conservation objectives of the Flannan Isles SPA, will not occur as a result of disturbance and displacement from airborne sound, underwater sound and presence of vessels and infrastructure in-combination with the Morgan and Morecambe Offshore Wind Farms: Transmission Assets, Morecambe Offshore Windfarm Generation Assets, as well as Tier 1, Tier 2 and Tier 3 projects.**

In-combination collision risk impacts

1.6.3.38 The assessment for in-combination collision risk impacts is presented for the operations and maintenance phase below for the SPAs and associated qualifying feature listed in Table 1.59.

Table 1.59: European sites and relevant offshore ornithological features from which the potential for an adverse effect could not be ruled out in relation to collision risk.

SPA	Qualifying feature
Morecambe Bay and Duddon Estuary SPA / Morecambe Bay Ramsar	Herring gull
	Breeding seabird assemblage
Ireland's Eye SPA	Kittiwake
Cape Wrath SPA	Kittiwake
Isles of Scilly SPA / Isles of Scilly Ramsar	Great black-backed gull *Larus marinus*
	Breeding seabird assemblage
North-west Irish Sea SPA	Kittiwake

Operations and maintenance phase

1.6.3.39 During the operations and maintenance phase of the Morgan Generation Assets, the turning rotors of the wind turbines may present a risk of collision for seabirds. When a collision occurs between the turning rotor blade and the bird, it is assumed to result in direct mortality of the bird, which potentially could result in population level impacts.

1.6.3.40 The MDS considered for the assessment of potential impacts on offshore ornithological features from in-combination collision risk impacts during the operations and maintenance phase is presented in Table 1.60. This MDS table is based on the MDS for the Morgan Generation Assets project alone in Volume 2, Chapter 5: Offshore Ornithology chapter of the Environmental Statement (Document Reference F2.5).

Table 1.60: Maximum design scenario considered for the assessment of potential impacts on offshore ornithological features from collision risk and displacement.

Phase	Maximum design scenario	Justification
Operations and maintenance phase	**Operations and maintenance phase** Presence of up to 96 wind turbines within the Morgan Array Area Minimum lower blade tip height of 34 m above LAT Minimum hub height of 159 m above LAT Maximum blade tip height of 293 m above LAT Maximum rotor diameter of 250 m Maximum chord width of 6.8 m Average rotor speed of 6.2 rpm (with maximum speed of 8.4 rpm) Operational lifetime of up to 35 years.	The potential for collision risk is derived from wind turbines parameters including rotor diameter, chord width, rotor speed and minimum lower blade tip height. The parameters associated with the most numerous wind turbine parameters (no. 96) represents the MDS because it will result in the greatest potential for collision risk.

Ireland's Eye SPA and North-west Irish Sea SPA

Kittiwake

1.6.3.41 Based on the mean-maximum foraging range +1SD of kittiwake (Woodward *et al*., 2019) from the Ireland's Eye SPA, there are numerous projects within foraging range of kittiwake from the SPA during the breeding season. In the non-breeding season, there are additional projects within the BDMPS of relevance to the species (Furness, 2015).

1.6.3.42 Table 1.61 presents the collision risk estimates for those projects for which quantified estimates can be obtained. These values represent the number of collisions apportioned to the kittiwake population of the Ireland's Eye SPA utilising both a 99.79% avoidance rate, reflecting the species-specific avoidance rate from Ozsanlav-Harris *et al.* (2023) and a 99.28% avoidance rate, reflecting the grouped all-gull avoidance rate from Ozsanlav-Harris *et al.* (2023). There are a number of projects for which there are no, or limited, data on the number of predicted collisions. For some of these projects qualitative assessments were conducted and these are summarised in Table 1.62.

1.6.3.43 Apportioning values for the breeding season have been taken from project-specific documentation, where available. If unavailable an apportioning value from the nearest project for which an apportioning value is available has been applied. In the non-breeding season, apportioning values calculated using information from Furness (2015) has been applied to collision risk estimates from all projects.

Table 1.61: Predicted annual breeding season mortality rate of kittiwake at the Ireland's Eye SPA resulting from collision risk impacts from projects considered in-combination.

a – apportioning value unavailable, assumed to be the same as the Morgan Generation Assets

b – apportioning value unavailable, assumed to be the same as Erebus offshore wind farm

Project	Seasonal apportioning values			Seasonal apportioned collision values (99.28% avoidance rate)			Seasonal apportioned collision values (99.79% avoidance rate)		
	Breeding	Post-breeding	Pre-breeding	Breeding	Post-breeding	Pre-breeding	Breeding	Post-breeding	Pre-breeding
Awel y Môr	0.013[a]	0.001	0.001	0.2	0.0	0.0	0.0	0.0	0.0
Burbo Bank Extension	0.016	0.001	0.001	0.4	0.0	0.0	0.1	0.0	0.0
Erebus	0.016	0.001	0.001	0.0	0.0	0.0	0.0	0.0	0.0
Mona Offshore Wind Project	0.013[a]	0.001	0.001	0.0	0.0	0.0	0.0	0.0	0.0
Morecambe Offshore Wind Farm: Generation Assets	0.013	0.001	0.001	0.3	0.0	0.0	0.1	0.0	0.0
Morgan Generation Assets	0.013	0.001	0.001	0.1	0.0	0.0	0.0	0.0	0.0
Ormonde	No connectivity	0.001	0.001	0.0	0.0	0.0	0.0	0.0	0.0

Project	Seasonal apportioning values			Seasonal apportioned collision values (99.28% avoidance rate)			Seasonal apportioned collision values (99.79% avoidance rate)		
	Breeding	**Post-breeding**	**Pre-breeding**	**Breeding**	**Post-breeding**	**Pre-breeding**	**Breeding**	**Post-breeding**	**Pre-breeding**
Rampion	No connectivity	0.001	0.001	-	0.0	0.0	-	0.0	0.0
Rampion 2	No connectivity	0.001	0.001	-	0.0	0.0	-	0.0	0.0
Twinhub	0.013[a]	0.001	0.001	-	0.0	0.0	-	0.0	0.0
Walney 3 + 4	0.016[b]	0.001	0.001	0.0	0.0	0.0	0.1	0.0	0.0
West of Orkney	No connectivity	0.001	0.001	0.0	0.0	0.0	0.0	0.0	0.0
White Cross	0.013[a]	0.001	0.001	0.4	0.0	0.0	0.0	0.0	0.0
Annual totals									
Scenario 2				0.5			0.1		
Scenario 3				1.7			0.5		

Table 1.62: Qualitative assessment of projects considered cumulatively with the Morgan Generation Assets for which quantitative consideration of collision risk was not undertaken in project-specific documentation for kittiwake.

Project	Connectivity	Reason for estimates being unavailable	Qualitative assessment	Final conclusion
Tier 1				
Burbo Bank (Seascape Energy Ltd., 2002)	Breeding, post - breeding and pre-breeding season. Apportioning value in the breeding season unknown Apportioning value in the post-breeding season = 0.06% Apportioning value in the pre-breeding season = 0.08%	Species not included in collision risk modelling	The assessment of collision risk was undertaken on a qualitative basis by investigating flight heights of birds at the project site and was undertaken for species considered to be of International or National importance in the context of the assessments undertaken for the project. Kittiwake was not considered to be a species of International or National importance. Surveys of the project comprised aerial and boat-based surveys both of which were undertaken during winter months (aerial = November to April and boat-based = December and February). Aerial surveys covered a large area encompassing the Liverpool Bay SPA with boat-based surveys covering the project area. The surveys were undertaken to provide abundance and distribution data for those species considered to be of most importance, namely common scoter and red-throated diver. Low numbers of kittiwake were recorded during boat-based surveys with relatively low numbers also recorded during aerial surveys.	No assessment was conducted for kittiwake in relation to collision risk impacts however, kittiwake was not considered to be a species of International or National importance in the context of the assessments undertaken on an EIA basis. Ireland's Eye SPA was not specifically considered in the assessments presented.
Walney 1 & 2 (RPS, 2006a)	Breeding, post - breeding and pre-breeding season. Apportioning value in the breeding season unknown Apportioning value in the post-breeding season = 0.06% Apportioning value in the pre-breeding season = 0.08%	Species not included in collision risk modelling	Site-specific surveys included boat-based surveys undertaken across an area of 512 km^2 in the vicinity of the project between May 2004 and September 2005. The project also utilised survey data collected by regional aerial surveys, undertaken across the NW3 aerial survey area between 2002 and 2006 and radar survey data collected between 01 October and 29 October 2005. Kittiwake was not included in collision risk modelling and it was considered that, due to the very low numbers of birds recorded at rotor height, that the magnitude of collision was negligible.	Very low significance on an EIA basis. Ireland's Eye SPA was not specifically considered in the assessments presented.

Project	Connectivity	Reason for estimates being unavailable	Qualitative assessment	Final conclusion
West of Duddon Sands (RPS, 2006b)	Breeding, post - breeding and pre-breeding season. Apportioning value in the breeding season unknown Apportioning value in the post-breeding season = 0.06% Apportioning value in the pre-breeding season = 0.08%	Species not included in collision risk modelling	Site-specific surveys included boat-based surveys undertaken across an area of 512 km^2 in the vicinity of the project between May 2004 and September 2005. The project also utilised survey data collected by regional aerial surveys, undertaken across the NW3 aerial survey area between 2002 and 2006 and radar survey data collected between 01 October and 29 October 2005. The peak population of kittiwake recorded in the project area plus 2 km buffer during aerial surveys was 14 birds. In boat-based surveys the equivalent population was 454 birds. The proportion of flying kittiwake recorded above 15 m was 15.5% across all boat-based surveys within the boat-based survey area. Kittiwake was deemed to be a species of low importance (termed sensitivity in the West of Duddon Sands assessments).	Very low significance on an EIA basis. Ireland's Eye SPA was not specifically considered in the assessments presented.
Gwynt y Môr (RWE Group and Npower Renewables, 2005)	Breeding, post - breeding and pre-breeding season. Apportioning value in the breeding season unknown Apportioning value in the post-breeding season = 0.06% Apportioning value in the pre-breeding season = 0.08%	Species not included in collision risk modelling	Site-specific surveys undertaken in support of the project included boat-based surveys undertaken between February 2003 and March 2005. Surveys between February 2003 and February 2004 covered a large area along the Welsh coast incorporating the project area with surveys between March 2004 and March 2005 more focussed on the project area. The assessment also used data from aerial surveys undertaken between 2000 and 2005 which were targeted at recording common scoter. The highest populations of kittiwake were recorded between March and May. During boat-based surveys used to characterise the project undertaken between 2004 to 2005, covering an area considered by the project assessment to better represent the behaviour of birds than the area associated with boat-based surveys undertaken in 2003 to 2004, 8,900 observations were obtained with only 22 flights recorded at a height of greater than 20 m. In 2004 to 2005 surveys, 603 kittiwake were recorded in flight with only 0.2% of these flying above 20 m.	Low significance due to low proportion of flight heights recorded at collision height. Ireland's Eye SPA was not specifically considered in the assessments presented.

Scenario 1: Morgan Generation Assets together with the Morgan and Morecambe Offshore Wind Farms: Transmission Assets

1.6.3.44 Collision risk is not an impact pathway associated with the Morgan and Morecambe Offshore Wind Farms: Transmission Assets. There is therefore considered to be no change to the assessments conducted in the Integrity test: Step 1 for the Morgan Generation Assets alone and a conclusion of no adverse effect on the integrity of the kittiwake feature of the Ireland's Eye SPA is reached. Further information on specific conservation objectives is provided in Table 1.64.

Scenario 2: Morgan Generation Assets together with the Morecambe Offshore Windfarm Generation Assets and the Morgan and Morecambe Offshore Wind Farms: Transmission Assets

1.6.3.45 The total collision risk for the Morgan Generation Assets and Morecambe Generation Assets apportioned to the kittiwake population at the Ireland's Eye SPA is 0.1 to 0.4 birds. This represents a 0.17% to 0.35% increase in the baseline mortality of the SPA population.

1.6.3.46 Based on the approach taken in the integrity test: Step 1 this is not considered to represent an adverse effect on the site integrity of the kittiwake feature of the Ireland's Eye SPA.

Scenario 3: Tier 1, Tier 2 and Tier 3: Morgan Generation Assets together with the Morgan and Morecambe Offshore Wind Farms: Transmission Assets and other relevant projects and plans.

1.6.3.47 The total collision risk for the Morgan Generation Assets and other projects apportioned to the kittiwake population at the Ireland's Eye SPA is 0.5 to 1.7 birds. This represents a 0.36% to 1.24% increase in the baseline mortality of the SPA population.

1.6.3.48 The kittiwake population at the Ireland's Eye SPA has declined since designation. The site was originally designated for 1,882 breeding individuals with the most recent population, censused as part of the Seabirds Count (Burnell *et al.,* 2023), being 910 breeding individuals. The trend at the SPA follows the national trend for Ireland.

1.6.3.49 For many of the projects for which there is connectivity with kittiwake from the SPA in the breeding season, the apportioning values presented do not account for the presence of immature and sabbatical birds at the project site. The proportion of these birds within the population present at a project can be significant and would therefore reduce the in-combination impact predicted in Table 1.61.

1.6.3.50 Avoidance rates for kittiwake used in collision risk modelling have been taken from Ozsanlav-Harris *et al.* (2023). The research conducted by Ozsanlav-Harris *et al*. (2023) reviews the approach to calculate the avoidance rate of specific species and groupings, comparing this to the approach by Cook (2021). The Ozsanlav-Harris *et al*. (2023) dataset contains information on collision data from 23 monitoring reports of 19 wind farms (including one offshore), encompassing 11 species or species groups spanning the years 2000 to 2019. Cook (2021) suggests that a minimum of 10 sites may be used as an arbitrary threshold sample size to inform the selection of species-specific avoidance rates over group-specific estimates. This threshold is not surpassed by the dataset for kittiwake used in The Ozsanlav-Harris *et al*. (2023) to calculate species-specific avoidance rates and it has therefore been suggested by the EWG that the all-gull avoidance rate is applied in modelling for kittiwake. Kittiwake is a far more marine in nature than any other gull species considered in Ozsanlav-Harris *et al.* (2023) and this is likely to be influence the species avoidance behaviour, potentially meaning that the application of an all gull rate is not applicable to kittiwake. The sites

incorporated into the calculation of the species-specific avoidance rate in Ozsanlav-Harris *et al.* (2023) are Blyth Harbour and the Thanet offshore wind farm. The area in which the Thanet offshore wind farm is located is considered highly comparable to the majority of projects considered in-combination, especially those in the Irish Sea. It is therefore likely that the species-specific avoidance rate in Ozsanlav-Harris *et al.* (2023) provide a better reflection of the likely avoidance behaviour of kittiwake and more weight should be placed on the assessments conducted utilising these avoidance rates.

1.6.3.51 In addition, Volume 4, Annex 5.3: Offshore Ornithology Collision Risk Modelling Technical Report of the Environmental Statement reviews the evidence supporting the use of different flight speeds in collision risk modelling for kittiwake. Based on the evidence presented in Volume 4, Annex 5.3: Offshore Ornithology Collision Risk Modelling Technical Report of the Environmental Statement it is considered that the best available evidence in relation to flight speed for kittiwake is the value presented by Skov *et al.* (2018) with this value supported by a larger sample size collected across all seasons than the value presented by Alerstam *et al.* (2007). The data associated with Skov *et al.* (2018) were also collected in UK waters in an area of sea that is considered similar to that in which the Morgan Generation Assets are located (i.e. not close to large breeding colonies) and more is known about the methodology employed to capture flight speed data. The value presented by Alerstam *et al.* (2007) is not considered representative of the flight speed of kittiwake due to the limited sample size and restricted seasonal coverage and it is therefore considered that it should not be used for collision risk modelling. It is important to note that the avoidance rates calculated in Ozsanlav-Harris *et al*. (2023) utilise the flight speed data from Alerstam *et al.* (2007) to derive avoidance rates. This therefore introduces an element of uncertainty in collision risk modelling that may deviate from the use of flight speed data from Alerstam *et al.* (2007). However, the flight speeds from Alerstam *et al.* (2007) are not appropriate for use in collision risk modelling, as discussed in Volume 4, Annex 5.3: Offshore Ornithology Collision Risk Modelling Technical Report of the Environmental Statement, and it is considered that the use of these flight speed data introduces a much greater level of uncertainty in collision risk estimates calculated using those data.

1.6.3.52 The use of species-specific avoidance rates and more robust flight speeds from Skov *et al.* (2018) has a significant effect on the collision risk estimates not only for the Morgan Generation Assets, as illustrated in Table 1.61 but also for projects considered in-combination. Whilst differences in avoidance rates can be addressed through a simple correction, updating collision risk estimates to account for differences in flight speed is more complex and, to provide an accurate estimate, would require updated modelling. Previous sensitivity analyses have shown that changes in flight speed from Alerstam *et al.* (2007) to Skov *et al.* (2018) can reduce collision risk estimates for kittiwake by approximately 27% (Ørsted, 2018).

1.6.3.53 Consideration has also been given to the differences in impact magnitude that occur between turbine scenarios that are assessed as part of project applications and those that are eventually built (as-built scenarios) (Table 1.63). If the collision risk estimates associated with the as-built turbine scenarios for all projects considered as part of the in-combination assessment were used, it is likely that the in-combination total would be significantly reduced and therefore represent an even smaller proportion of the baseline mortality of the SPA population. Walney Extension and Burbo Bank Extension are the biggest contributors to the in-combination total, albeit with impacts of less than 0.5 collisions/annum and it is anticipated that these impacts are, in reality, significantly lower.

Table 1.63: Comparison of differences being assessed and as-built turbine scenario for projects considered in-combination.

Project	Assessed turbine scenario	As-built turbine scenario	Collision risk estimate used in assessments	Likely impact on collision risk estimates due to change in turbine scenario
Burbo Bank Extension	69 x 3.6 MW	32 x 8 MW	0.1 to 0.4	Significant reduction. Fewer turbines, larger turbine
Rampion	175 x 4 MW with a lower tip height of 35 m	116 x 3.45 MW with a lower tip height of 28 m	<0.1	Likely no change. Reduction in the number of turbines likely balanced by increase in risk from the smaller turbine model and decreased lower tip height
Walney 3 + 4	207 x 3.6 MW with a lower tip height of 22 m	87 turbines with capacities of 7 and 8 MW with a lower tip height of 34 and 31 m	0.1 to 0.5	Significant reduction. The as-built scenario at Walney Extension consists of fewer, larger, higher turbines. Updated collision risk modelling for Walney Extension has shown significant reductions in the associated collision risk (Wheeldon et al., 2023).

1.6.3.54 When taking into account the following elements of the assessment as discussed above it is considered that the collision total associated with the Morgan Generation Assets in-combination with other projects will not surpass the 1% baseline mortality threshold of the kittiwake population at the Ireland's Eye SPA:

- Over-estimation of impacts associated with the projects with connectivity in the breeding season due to immature birds not being accounted for within the apportioning process undertaken for that project.
- Over-estimation of impacts associated with the projects with connectivity in the breeding season due to sabbatical birds not being accounted for within the apportioning process undertaken for that project.
- It is considered that an avoidance rate of 99.79% is appropriate for kittiwake based on the information presented in Ozsanlav-Harris *et al.* (2023) (see Volume 4, Annex 5.3: Offshore Ornithology Collision Risk Modelling Technical Report).
- It is considered that the flight speed information provided by Skov *et al.* (2018) provides a far more robust appraisal of kittiwake flight behaviour than any other source of flight height data (see Volume 4, Annex 5.3: Offshore Ornithology Collision Risk Modelling Technical Report).
- Use of collision risk estimates that represent the assessed turbine scenario at projects that make a significant contribution. The total potential in-combination impact, with the use of as-built scenarios leading to significant reductions in collision risk estimates.

1.6.3.55 Following the methodology applied in the integrity test: Step 1 it is therefore considered that there is no AEOI of the Ireland's Eye SPA as a result of in-combination collision impacts on kittiwake. An assessment against the conservation objectives for the kittiwake population of the Ireland's Eye SPA is provided in Table 1.64.

1.6.3.56 The conclusions reached for the kittiwake population at the Ireland's Eye SPA are also considered applicable to the North-west Irish Sea SPA. An assessment against the conservation objectives for the kittiwake feature of the North-west Irish Sea SPA is provided in Table 1.65.

Table 1.64: Conclusions against the conservation objectives of the kittiwake qualifying feature of the Ireland's Eye SPA for in-combination collision risk impacts.

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Tier 1, Tier 2, Tier 3 projects
Population size: Long term SPA population trend is stable or increasing	• Collision risk impacts are not applicable to the Morgan and Morecambe Offshore Wind Farms: Transmission Assets and therefore the assessment undertaken for the Morgan Generation Assets alone in section 1.5 remains unchanged.	• Potential impacts from the Morgan Generation Assets, and Morecambe Generation Assets on the kittiwake feature of the Ireland's Eye SPA will occur throughout the annual cycle. The predicted in-combination impact is considered to represent less than a 1% increase in the baseline mortality of the SPA population. • Kittiwake is sensitive to collision risk impacts (Wade *et al.,* 2016) however, the magnitude of predicted impacts apportioned to the SPA will not exceed the 1% threshold of baseline mortality. Therefore, collision risk during the operations and maintenance phase will not prevent the population of kittiwake from being maintained or restored.	• Potential impacts from the Morgan Generation Assets, and all other projects considered in-combination on the kittiwake feature of the Ireland's Eye SPA will occur throughout the annual cycle. The predicted in-combination impact is considered to represent less than a 1% increase in the baseline mortality of the SPA population. • Kittiwake is sensitive to collision risk impacts (Wade et al., 2016) however, the magnitude of predicted impacts apportioned to the SPA will not exceed the 1% threshold of baseline mortality. Therefore, collision risk during the operations and maintenance phase will not prevent the population of kittiwake from being maintained or restored.
Spatial distribution: Sufficient number of locations, area, and availability (in terms of timing and intensity of use) of suitable habitat to support the population	• There is no impact pathway for this conservation objective.	• There is no impact pathway for this conservation objective.	• There is no impact pathway for this conservation objective.
Forage spatial distribution, extent, abundance and availability: Sufficient number of locations, area of suitable habitat and available forage biomass to support the population target	• There is no impact pathway for this conservation objective.	• There is no impact pathway for this conservation objective.	• There is no impact pathway for this conservation objective.

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Tier 1, Tier 2, Tier 3 projects
Disturbance across the site: The intensity, frequency, timing and duration of disturbance occurs at levels that do not significantly impact the achievement of targets for population size and spatial distribution	• There is no impact pathway for this conservation objective.	• There is no impact pathway for this conservation objective.	• There is no impact pathway for this conservation objective.
Barriers to connectivity: The number, location, shape and area of barriers do not significantly impact the site population's access to the SPA or other ecologically important site outside the SPA	• There is no impact pathway for this conservation objective.	• There is no impact pathway for this conservation objective.	• There is no impact pathway for this conservation objective.
Conclusion	**Adverse effects on the kittiwake qualifying feature, which undermine the conservation objectives of the Ireland's Eye SPA, will not occur as a result of collision risk in-combination with the Morgan and Morecambe Offshore Wind Farms: Transmission Assets**	**Adverse effects on the kittiwake qualifying feature, which undermine the conservation objectives of the Ireland's Eye SPA, will not occur as a result of collision risk in-combination with the Morgan and Morecambe Offshore Wind Farms: Transmission Assets and Morecambe Offshore Windfarm Generation Assets.**	**Adverse effects on the kittiwake qualifying feature, which undermine the conservation objectives of the Ireland's Eye SPA, will not occur as a result of collision risk in-combination with the Morgan and Morecambe Offshore Wind Farms: Transmission Assets, Morecambe Offshore Windfarm Generation Assets, as well as Tier 1, Tier 2 and Tier 3 projects.**

Table 1.65: Conclusions against the conservation objectives of the kittiwake qualifying feature of the North-west Irish Sea SPA for in-combination collision risk impacts.

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Tier 1, Tier 2, Tier 3 projects
Population size: Long term SPA population trend is stable or increasing	• Collision risk impacts are not applicable to the Morgan and Morecambe Offshore Wind Farms: Transmission Assets and therefore the assessment undertaken for the Morgan Generation Assets alone in section 1.5 remains unchanged.	• Potential impacts from the Morgan Generation Assets, and Morecambe Generation Assets on the kittiwake feature of the North-west Irish Sea SPA will occur throughout the annual cycle. The predicted in-combination impact is considered to represent less than a 1% increase in the baseline mortality of the SPA population. • Kittiwake is sensitive to collision risk impacts (Wade *et al.,* 2016) however, the magnitude of predicted impacts apportioned to the SPA will not exceed the 1% threshold of baseline mortality. Therefore, collision risk during the operations and maintenance phase will not prevent the population of kittiwake from being maintained or restored.	• Potential impacts from the Morgan Generation Assets, and all other projects considered in-combination on the kittiwake feature of the North-west Irish Sea SPA will occur throughout the annual cycle. The predicted in-combination impact is considered to represent less than a 1% increase in the baseline mortality of the SPA population. • Kittiwake is sensitive to collision risk impacts (Wade et al., 2016) however, the magnitude of predicted impacts apportioned to the SPA will not exceed the 1% threshold of baseline mortality. Therefore, collision risk during the operations and maintenance phase will not prevent the population of kittiwake from being maintained or restored.
Spatial distribution: Sufficient number of locations, area, and availability (in terms of timing and intensity of use) of suitable habitat to support the population	• There is no impact pathway for this conservation objective.	• There is no impact pathway for this conservation objective.	• There is no impact pathway for this conservation objective.
Forage spatial distribution, extent, abundance and availability: Sufficient number of locations, area of suitable habitat and available forage biomass to support the population target	• There is no impact pathway for this conservation objective.	• There is no impact pathway for this conservation objective.	• There is no impact pathway for this conservation objective.

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Tier 1, Tier 2, Tier 3 projects
Disturbance across the site: The intensity, frequency, timing and duration of disturbance occurs at levels that do not significantly impact the achievement of targets for population size and spatial distribution	• There is no impact pathway for this conservation objective.	• There is no impact pathway for this conservation objective.	• There is no impact pathway for this conservation objective.
Barriers to connectivity: The number, location, shape and area of barriers do not significantly impact the site population's access to the SPA or other ecologically important site outside the SPA	• There is no impact pathway for this conservation objective.	• There is no impact pathway for this conservation objective.	• There is no impact pathway for this conservation objective.
Conclusion	**Adverse effects on the kittiwake qualifying feature, which undermine the conservation objectives of the North-west Irish Sea SPA, will not occur as a result of collision risk in-combination with the Morgan and Morecambe Offshore Wind Farms: Transmission Assets**	**Adverse effects on the kittiwake qualifying feature, which undermine the conservation objectives of the North-west Irish Sea SPA, will not occur as a result of collision risk in-combination with the Morgan and Morecambe Offshore Wind Farms: Transmission Assets and Morecambe Offshore Windfarm Generation Assets.**	**Adverse effects on the kittiwake qualifying feature, which undermine the conservation objectives of the North-west Irish Sea SPA, will not occur as a result of collision risk in-combination with the Morgan and Morecambe Offshore Wind Farms: Transmission Assets, Morecambe Offshore Windfarm Generation Assets, as well as Tier 1, Tier 2 and Tier 3 projects.**

Cape Wrath SPA

Kittiwake

1.6.3.57 Based on the mean-maximum foraging range +1SD of kittiwake (Woodward *et al*., 2019) from the Cape Wrath SPA, there is only one project within foraging range of kittiwake from the SPA during the breeding season. In the non-breeding season, there are additional projects within the BDMPS of relevance to the species (Furness, 2015).

1.6.3.58 Table 1.66 presents the collision risk estimates for those projects for which quantified estimates can be obtained. These values represent the number of collisions apportioned to the kittiwake population of the Cape Wrath SPA utilising both a 99.79% avoidance rate, reflecting the species-specific avoidance rate from Ozsanlav-Harris *et al.* (2023) and a 99.28% avoidance rate, reflecting the grouped all-gull avoidance rate from Ozsanlav-Harris *et al.* (2023). There are a number of projects for which there are no, or limited, data on the number of predicted collisions. For some of these projects qualitative assessments were conducted and these are summarised in Table 1.67.

1.6.3.59 Apportioning values for the breeding season have been taken from project-specific documentation, where available. If unavailable an apportioning value from the nearest project for which an apportioning value is available has been applied. In the non-breeding season, apportioning values calculated using information from Furness (2015) has been applied to collision risk estimates from all projects.

Table 1.66: Predicted annual breeding season mortality rate of kittiwake at Cape Wrath SPA resulting from collision risk impacts from projects considered in-combination.

a – apportioning value unavailable, assumed to be the same as the Morgan Generation Assets

b – apportioning value unavailable, assumed to be the same as Erebus offshore wind farm

Project	Seasonal apportioning values			Seasonal apportioned collision values (99.28% avoidance rate)			Seasonal apportioned collision values (99.79% avoidance rate)		
	Breeding	Post-breeding	Pre-breeding	Breeding	Post-breeding	Pre-breeding	Breeding	Post-breeding	Pre-breeding
Awel y Môr	No connectivity	0.014	0.024	-	0.1	0.3	-	0.0	0.1
Burbo Bank Extension	No connectivity	0.014	0.024	-	0.0	0.0	-	0.0	0.0
Erebus	No connectivity	0.014	0.024	-	0.3	0.3	-	0.1	0.1
Mona Offshore Wind Project	No connectivity	0.014	0.024	-	0.0	0.1	-	0.0	0.1
Morecambe Offshore Wind Farm: Generation Assets	No connectivity	0.014	0.024	-	0.2	0.1	-	0.0	0.0
Morgan Generation Assets	No connectivity	0.014	0.024	-	0.3	0.3	-	0.1	0.1

Project	Seasonal apportioning values			Seasonal apportioned collision values (99.28% avoidance rate)			Seasonal apportioned collision values (99.79% avoidance rate)		
	Breeding	Post-breeding	Pre-breeding	Breeding	Post-breeding	Pre-breeding	Breeding	Post-breeding	Pre-breeding
Ormonde	No connectivity	0.014	0.024	-	0.0	0.0	-	0.0	0.0
Rampion	No connectivity	0.014	0.024	-	0.2	0.4	-	0.1	0.1
Rampion 2	No connectivity	0.014	0.024	-	0.1	0.4	-	0.0	0.1
Twinhub	No connectivity	0.014	0.024	-	0.0	0.1	-	0.0	0.0
Walney 3 + 4	No connectivity	0.014	0.024	-	0.8	1.1	-	0.2	0.3
West of Orkney	0.229	0.014	0.024	4.5	0.2	0.5	1.3	0.1	0.1
White Cross	No connectivity	0.014	0.024	-	0.0	0.3	-	0.0	0.1
Annual totals									
Scenario 2				0.9			0.2		
Scenario 3				10.8			3.2		

Table 1.67: Qualitative assessment of projects considered cumulatively with the Morgan Generation Assets for which quantitative consideration of collision risk was not undertaken in project-specific documentation for kittiwake.

Project	Connectivity	Reason for estimates being unavailable	Qualitative assessment	Final conclusion
Tier 1				
Burbo Bank (Seascape Energy Ltd., 2002)	Breeding, post - breeding and pre-breeding season. Apportioning value in the breeding season unknown Apportioning value in the post-breeding season = 0.01% Apportioning value in the pre-breeding season = 0.02%	Species not included in collision risk modelling	The assessment of collision risk was undertaken on a qualitative basis by investigating flight heights of birds at the project site and was undertaken for species considered to be of International or National importance in the context of the assessments undertaken for the project. Kittiwake was not considered to be a species of International or National importance. Surveys of the project comprised aerial and boat-based surveys both of which were undertaken during winter months (aerial = November to April and boat-based = December and February). Aerial surveys covered a large area encompassing the Liverpool Bay SPA with boat-based surveys covering the project area. The surveys were undertaken to provide abundance and distribution data for those species considered to be of most importance, namely common scoter and red-throated diver. Low numbers of kittiwake were recorded during boat-based surveys with relatively low numbers also recorded during aerial surveys.	No assessment was conducted for kittiwake in relation to collision risk impacts however, kittiwake was not considered to be a species of International or National importance in the context of the assessments undertaken on an EIA basis. Cape Wrath SPA was not specifically considered in the assessments presented.
Walney 1 & 2 (RPS, 2006a)	Breeding, post - breeding and pre-breeding season. Apportioning value in the breeding season unknown Apportioning value in the post-breeding season = 0.01% Apportioning value in the pre-breeding season = 0.02%	Species not included in collision risk modelling	Site-specific surveys included boat-based surveys undertaken across an area of 512 km^2 in the vicinity of the project between May 2004 and September 2005. The project also utilised survey data collected by regional aerial surveys, undertaken across the NW3 aerial survey area between 2002 and 2006 and radar survey data collected between 01 October and 29 October 2005. Kittiwake was not included in collision risk modelling and it was considered that, due to the very low numbers of birds recorded at rotor height, that the magnitude of collision was negligible.	Very low significance on an EIA basis. Cape Wrath SPA was not specifically considered in the assessments presented.

Project	Connectivity	Reason for estimates being unavailable	Qualitative assessment	Final conclusion
West of Duddon Sands (RPS, 2006b)	Breeding, post - breeding and pre-breeding season. Apportioning value in the breeding season unknown Apportioning value in the post-breeding season = 0.01% Apportioning value in the pre-breeding season = 0.02%	Species not included in collision risk modelling	Site-specific surveys included boat-based surveys undertaken across an area of 512 km^2 in the vicinity of the project between May 2004 and September 2005. The project also utilised survey data collected by regional aerial surveys, undertaken across the NW3 aerial survey area between 2002 and 2006 and radar survey data collected between 01 October and 29 October 2005. The peak population of kittiwake recorded in the project area plus 2 km buffer during aerial surveys was 14 birds. In boat-based surveys the equivalent population was 454 birds. The proportion of flying kittiwake recorded above 15 m was 15.5% across all boat-based surveys within the boat-based survey area. Kittiwake was deemed to be a species of low importance (termed sensitivity in the West of Duddon Sands assessments).	Very low significance on an EIA basis. Cape Wrath SPA was not specifically considered in the assessments presented.
Gwynt y Môr (RWE Group and Npower Renewables, 2005)	Breeding, post - breeding and pre-breeding season. Apportioning value in the breeding season unknown Apportioning value in the post-breeding season = 0.01% Apportioning value in the pre-breeding season = 0.02%	Species not included in collision risk modelling	Site-specific surveys undertaken in support of the project included boat-based surveys undertaken between February 2003 and March 2005. Surveys between February 2003 and February 2004 covered a large area along the Welsh coast incorporating the project area with surveys between March 2004 and March 2005 more focussed on the project area. The assessment also used data from aerial surveys undertaken between 2000 and 2005 which were targeted at recording common scoter. The highest populations of kittiwake were recorded between March and May. During boat-based surveys used to characterise the project undertaken between 2004 to 2005, covering an area considered by the project assessment to better represent the behaviour of birds than the area associated with boat-based surveys undertaken in 2003 to 2004, 8,900 observations were obtained with only 22 flights recorded at a height of greater than 20 m. In 2004 to 2005 surveys, 603 kittiwake were recorded in flight with only 0.2% of these flying above 20 m.	Low significance due to low proportion of flight heights recorded at collision height. Cape Wrath SPA was not specifically considered in the assessments presented.

Scenario 1: Morgan Generation Assets together with the Morgan and Morecambe Offshore Wind Farms: Transmission Assets

1.6.3.60 Collision risk is not an impact pathway associated with the Morgan and Morecambe Offshore Wind Farms: Transmission Assets. There is therefore considered to be no change to the assessments conducted in the Integrity test: Step 1 for the Morgan Generation Assets alone and a conclusion of no adverse effect on the integrity of the kittiwake feature of the Ireland's Eye SPA is reached. Further information on specific conservation objectives is provided in Table 1.69.

Scenario 2: Morgan Generation Assets together with the Morecambe Offshore Windfarm Generation Assets and the Morgan and Morecambe Offshore Wind Farms: Transmission Assets

1.6.3.61 The total collision risk for the Morgan Generation Assets and Morecambe Generation Assets apportioned to the kittiwake population at the Cape Wrath SPA is 0.2 to 0.9 birds. This represents a 0.02% to 0.08% increase in the baseline mortality of SPA population.

1.6.3.62 Based on the approach taken in the integrity test: Step 1 this is not considered to represent an adverse effect on the site integrity of the kittiwake feature of the Ireland's Eye SPA. Further information on specific conservation objectives is provided in Table 1.69.

Scenario 3: Tier 1, Tier 2 and Tier 3: Morgan Generation Assets together with the Morgan and Morecambe Offshore Wind Farms: Transmission Assets and other relevant projects and plans.

1.6.3.63 The total collision risk for the Morgan Generation Assets and other projects apportioned to the kittiwake population at the Cape Wrath SPA is 3.2 to 10.8 birds. This predicted impact therefore represents a 0.30% to 1.02% increase in the baseline mortality of the SPA population.

1.6.3.64 The kittiwake population at the Cape Wrath SPA has declined since designation. The site was originally designated for 19,400 breeding individuals with the most recent population, censused as part of the Seabirds Count (Burnell *et al.,* 2023), being 7,244 breeding individuals. The trend at the SPA follows the national trend for Scotland.

1.6.3.65 The largest contributor to the in-combination impact is the West of Orkney offshore wind farm, due to this project being within the foraging range of kittiwake from the SPA during the breeding season (all other projects are outside the foraging range of kittiwake from the SPA during the breeding season). The apportioning approach undertaken for the West of Orkney offshore wind farm assumes that all birds present at the wind farm are breeding adult birds. This assumption represents a known over-estimation as although it can be difficult to determine the proportion of immature kittiwake present within a given sea area during the breeding season, these birds are known to be present. However, immature birds will be present and, are likely to represent a significant proportion of the population of birds present. The impact on the kittiwake population at the Cape Wrath SPA from the West of Orkney wind farm is therefore likely to be considerably lower than predicted in Table 1.66. In addition, as discussed in Volume 4, Annex 5.5: Offshore Ornithology Apportioning Technical Report of the Environmental Statement a population of birds in a given sea area is also likely to consist of sabbatical birds. This could represent 18.0-20.8% of the birds present.

1.6.3.66 Avoidance rates for kittiwake used in collision risk modelling have been taken from Ozsanlav-Harris *et al.* (2023). The research conducted by Ozsanlav-Harris *et al*. (2023) reviews the approach to calculate the avoidance rate of specific species and

groupings, comparing this to the approach by Cook (2021). The Ozsanlav-Harris *et al*. (2023) dataset contains information on collision data from 23 monitoring reports of 19 wind farms (including one offshore), encompassing 11 species or species groups spanning the years 2000 to 2019. Cook (2021) suggests that a minimum of 10 sites may be used as an arbitrary threshold sample size to inform the selection of species-specific avoidance rates over group-specific estimates. This threshold is not surpassed by the dataset for kittiwake used in The Ozsanlav-Harris *et al*. (2023) to calculate species-specific avoidance rates and it has therefore been suggested by the EWG that the all-gull avoidance rate is applied in modelling for kittiwake. Kittiwake is a far more marine in nature than any other gull species considered in Ozsanlav-Harris *et al.* (2023) and this is likely to be influence the species avoidance behaviour, potentially meaning that the application of an all gull rate is not applicable to kittiwake. The sites incorporated into the calculation of the species-specific avoidance rate in Ozsanlav-Harris *et al.* (2023) are Blyth Harbour and the Thanet offshore wind farm. The area in which the Thanet offshore wind farm is located is considered highly comparable to the majority of projects considered in-combination, especially those in the Irish Sea. It is therefore likely that the species-specific avoidance rate in Ozsanlav-Harris *et al.* (2023) provide a better reflection of the likely avoidance behaviour of kittiwake and more weight should be placed on the assessments conducted utilising these avoidance rates.

1.6.3.67 In addition, Volume 4, Annex 5.3: Offshore Ornithology Collision Risk Modelling Technical Report of the Environmental Statement reviews the evidence supporting the use of different flight speeds in collision risk modelling for kittiwake. Based on the evidence presented in Volume 4, Annex 5.3: Offshore Ornithology Collision Risk Modelling Technical Report of the Environmental Statement it is considered that the best available evidence in relation to flight speed for kittiwake is the value presented by Skov *et al.* (2018) with this value supported by a larger sample size collected across all seasons than the value presented by Alerstam *et al.* (2007). The data associated with Skov *et al.* (2018) were also collected in UK waters in an area of sea that is considered similar to that in which the Morgan Generation Assets are located (i.e. not close to large breeding colonies) and more is known about the methodology employed to capture flight speed data. The value presented by Alerstam *et al.* (2007) is not considered representative of the flight speed of kittiwake due to the limited sample size and restricted seasonal coverage and it is therefore considered that it should not be used for collision risk modelling. It is important to note that the avoidance rates calculated in Ozsanlav-Harris *et al*. (2023) utilise the flight speed data from Alerstam *et al.* (2007) to derive avoidance rates. This therefore introduces an element of uncertainty in collision risk modelling that may deviate from the use of flight speed data from Alerstam *et al.* (2007). However, the flight speeds from Alerstam *et al.* (2007) are not appropriate for use in collision risk modelling, as discussed in Volume 4, Annex 5.3: Offshore Ornithology Collision Risk Modelling Technical Report of the Environmental Statement, and it is considered that the use of these flight speed data introduces a much greater level of uncertainty in collision risk estimates calculated using those data.

1.6.3.68 The use of species-specific avoidance rates and more robust flight speeds from Skov *et al.* (2018) has a significant effect on the collision risk estimates not only for the Morgan Generation Assets, as illustrated in Table 1.66 but also for projects considered in-combination. Whilst differences in avoidance rates can be addressed through a simple correction, updating collision risk estimates to account for differences in flight speed is more complex and, to provide an accurate estimate, would require updated modelling. Previous sensitivity analyses have shown that changes in flight speed from

Alerstam *et al.* (2007) to Skov *et al.* (2018) can reduce collision risk estimates for kittiwake by approximately 27% (Ørsted, 2018).

1.6.3.69 Consideration has also been given to the differences in impact magnitude that occur between turbine scenarios that are assessed as part of project applications and those that are eventually built (as-built scenarios) (Table 1.68). If the collision risk estimates associated with the as-built turbine scenarios for all projects considered as part of the in-combination assessment were used, it is likely that the in-combination total would be significantly reduced and therefore represent an even smaller proportion of the baseline mortality of the SPA population. Walney Extension and Rampion are two of the biggest contributors to the in-combination total, albeit with an impact of only 0.5 to 1.8 and 0.2 to 0.7 collisions/annum, respectively and it is anticipated that these impacts are, in reality, significantly lower.

Table 1.68: Comparison of differences being assessed and as-built turbine scenario for projects considered in-combination.

Project	Assessed turbine scenario	As-built turbine scenario	Collision risk estimate used in assessments	Likely impact on collision risk estimates due to change in turbine scenario
Burbo Bank Extension	69 x 3.6 MW	32 x 8 MW	<0.1	Significant reduction. Fewer turbines, larger turbine.
Rampion	175 x 4 MW with a lower tip height of 35 m	116 x 3.45 MW with a lower tip height of 28 m	0.2 to 0.7	Likely no change. Reduction in the number of turbines likely balanced by increase in risk from the smaller turbine model and decreased lower tip height.
Walney 3 + 4	207 x 3.6 MW with a lower tip height of 22 m	87 turbines with capacities of 7 and 8 MW with a lower tip height of 34 and 31 m	0.5 to 1.8	Significant reduction. The as-built scenario at Walney Extension consists of fewer, larger, higher turbines. Updated collision risk modelling for Walney Extension has shown significant reductions in the associated collision risk (Wheeldon et al., 2023).

1.6.3.70 When taking into account the following elements of the assessment as discussed above it is considered that the collision total associated with the Morgan Generation Assets in-combination with other projects will not surpass the 1% baseline mortality threshold of the kittiwake population at the Cape Wrath SPA:

- Over-estimation of impacts associated with the West of Orkney wind farm due to immature birds not being accounted for within the apportioning process undertaken for that project
- Over-estimation of impacts associated with the West of Orkney wind farm due to sabbatical birds not being accounted for within the apportioning process undertaken for that project

- It is considered that an avoidance rate of 99.79% is appropriate for kittiwake based on the information presented n Ozsanlav-Harris *et al.* (2023) (see Volume 4, Annex 5.3: Offshore Ornithology Collision Risk Modelling Technical Report)
- It is considered that the flight speed information provided by Skov *et al.* (2018) provides a far more robust appraisal of kittiwake flight behaviour than any other source of flight height data (see Volume 4, Annex 5.3: Offshore Ornithology Collision Risk Modelling Technical Report)
- Use of collision risk estimates that represent the assessed turbine scenario at projects that make a significant contribution. The total potential in-combination impact, with the use of as-built scenarios leading to significant reductions in collision risk estimates.

1.6.3.71 Following the methodology applied in the integrity test: Step 1 it is therefore considered that there is no AEOI of the Cape Wrath SPA as a result of in-combination collision impacts on kittiwake. An assessment against the conservation objectives for the kittiwake population of the Cape Wrath SPA is provided in Table 1.69.

Table 1.69: Conclusions against the conservation objectives of the kittiwake qualifying feature of the Cape Wrath SPA for in-combination collision risk impacts.

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Tier 1, Tier 2, Tier 3 projects
Population size: Long term SPA population trend is stable or increasing	• Collision risk impacts are not applicable to the Morgan and Morecambe Offshore Wind Farms: Transmission Assets and therefore the assessment undertaken for the Morgan Generation Assets alone in section 1.5 remains unchanged.	• Potential impacts from the Morgan Generation Assets, and Morecambe Generation Assets on the kittiwake feature of the Cape Wrath SPA will occur throughout the annual cycle. The predicted in-combination impact is considered to represent less than a 1% increase in the baseline mortality of the SPA population. • Kittiwake is sensitive to collision risk impacts (Wade *et al.,* 2016) however, the magnitude of predicted impacts apportioned to the SPA will not exceed the 1% threshold of baseline mortality. Therefore, collision risk during the operations and maintenance phase will not prevent the population of kittiwake from being maintained or restored.	• Potential impacts from the Morgan Generation Assets, and all other projects considered in-combination on the kittiwake feature of the Cape Wrath SPA will occur throughout the annual cycle. The predicted in-combination impact is considered to represent less than a 1% increase in the baseline mortality of the SPA population. • Kittiwake is sensitive to collision risk impacts (Wade et al., 2016) however, the magnitude of predicted impacts apportioned to the SPA will not exceed the 1% threshold of baseline mortality. Therefore, collision risk during the operations and maintenance phase will not prevent the population of kittiwake from being maintained or restored.
Spatial distribution: Sufficient number of locations, area, and availability (in terms of timing and intensity of use) of suitable habitat to support the population	• There is no impact pathway for this conservation objective.	• There is no impact pathway for this conservation objective.	• There is no impact pathway for this conservation objective.
Forage spatial distribution, extent, abundance and availability: Sufficient number of locations, area of suitable habitat and available forage biomass to support the population target	• There is no impact pathway for this conservation objective.	• There is no impact pathway for this conservation objective.	• There is no impact pathway for this conservation objective.

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Tier 1, Tier 2, Tier 3 projects
Disturbance across the site: The intensity, frequency, timing and duration of disturbance occurs at levels that do not significantly impact the achievement of targets for population size and spatial distribution	• There is no impact pathway for this conservation objective.	• There is no impact pathway for this conservation objective.	• There is no impact pathway for this conservation objective.
Barriers to connectivity: The number, location, shape and area of barriers do not significantly impact the site population's access to the SPA or other ecologically important site outside the SPA	• There is no impact pathway for this conservation objective.	• There is no impact pathway for this conservation objective.	• There is no impact pathway for this conservation objective.
Conclusion	**Adverse effects on the kittiwake qualifying feature, which undermine the conservation objectives of the Cape Wrath SPA, will not occur as a result of collision risk in-combination with the Morgan and Morecambe Offshore Wind Farms: Transmission Assets**	**Adverse effects on the kittiwake qualifying feature, which undermine the conservation objectives of the Cape Wrath SPA, will not occur as a result of collision risk in-combination with the Morgan and Morecambe Offshore Wind Farms: Transmission Assets and Morecambe Offshore Windfarm Generation Assets.**	**Adverse effects on the kittiwake qualifying feature, which undermine the conservation objectives of the Cape Wrath SPA, will not occur as a result of collision risk in-combination with the Morgan and Morecambe Offshore Wind Farms: Transmission Assets, Morecambe Offshore Windfarm Generation Assets, as well as Tier 1, Tier 2 and Tier 3 projects.**

Morecambe Bay and Duddon Estuary SPA / Morecambe Bay Ramsar Site

Herring gull

1.6.3.72 Based on the mean-maximum foraging range +1SD of herring gull (Woodward *et al*., 2019) from the Morecambe Bay and Duddon Estuary SPA / Morecambe Bay Ramsar site, there are a number of projects within foraging range of

1.6.3.73 herring gull from the SPA during the breeding season. In the non-breeding season, there are further projects within the BDMPS of relevance to the species (Furness, 2015).

1.6.3.74 Table 1.70 presents the collision risk estimates for those projects for which quantified estimates can be obtained. These values represent the number of collisions apportioned to the herring gull population of the Morecambe Bay and Duddon Estuary SPA / Morecambe Bay Ramsar site utilising a 99.52% avoidance rate. As discussed in Volume 4, Annex 5.3: Offshore Ornithology Collision Risk Modelling Technical Report of the Environmental Statement, the use of this species-specific avoidance rate from Ozsanlav-Harris *et al.* (2023) (instead of the grouped value presented in Ozsanlav-Harris *et al.,* 2023) is considered to provide a more accurate appraisal of the likely collision risk for herring gull. Collision risk estimates are also presented in Table 1.70 using an avoidance rate of 99.39%, as advocated by Natural England and, for the Morgan Generation Assets, represent collision risk estimates calculated using parameters as advocated by Natural England.

1.6.3.75 Apportioning values for the breeding season have been taken from project-specific documentation, where available. If unavailable an apportioning value from the nearest project for which an apportioning value is available has been applied. In the non-breeding season, apportioning values calculated using information from Furness (2015) has been applied to collision risk estimates from all projects. There are a number of projects for which there are no, or limited, data on the number of predicted collisions. For some of these projects qualitative assessments were conducted and these are summarised in Table 1.71.

Table 1.70: Predicted annual breeding season mortality rate of herring gull from the Morecambe Bay and Duddon Estuary SPA / Morecambe Bay Ramsar site resulting from collision risk from projects considered in-combination.

Project	Seasonal apportioning values		Seasonal apportioned collision values (99.39% avoidance rate)		Seasonal apportioned collision values (99.52% avoidance rate)	
	Breeding	Non-breeding	Breeding	Non-breeding	Breeding	Non-breeding
Awel y Môr	0.062	0.016	0.1	0.0	0.0	0.0
Burbo Bank Extension	0.060	0.016	1.0	0.2	0.8	0.2
Erebus	No connectivity	0.016	-	0.0	-	0.0
Mona Offshore Wind Project	0.110	0.016	0.0	0.0	0.0	0.0

Project	Seasonal apportioning values		Seasonal apportioned collision values (99.39% avoidance rate)		Seasonal apportioned collision values (99.52% avoidance rate)	
	Breeding	Non-breeding	Breeding	Non-breeding	Breeding	Non-breeding
Morecambe Offshore Wind Farm: Generation Assets	0.000	0.016	0.0	0.0	0.0	0.0
Morgan Generation Assets	0.159	0.016	0.3	0.1	0.2	0.1
Ormonde	0.411	0.016	0.0	0.0	0.0	0.0
Twinhub	No connectivity	0.016	-	0.2	-	0.2
Walney 3 + 4	0.411	0.016	17.0	0.4	13.3	0.3
White Cross	No connectivity	0.016	-	0.0	-	0.0
Totals						
Scenario 2			**0.4**		**0.3**	
Scenario 3			**19.4**		**15.2**	

Table 1.71: Qualitative assessment of projects considered in-combination with the Morgan Generation Assets for which quantitative consideration of collision risk was not undertaken in project-specific documentation for herring gull.

Project	Connectivity	Reason for estimates being unavailable	Qualitative assessment	Final conclusion
Burbo Bank (Seascape Energy Ltd., 2002)	Breeding and non-breeding season. Apportioning value in the breeding season unknown (however, see paragraphs 1.6.3.81 to 1.6.3.82) Apportioning value in the non-breeding season = 1.6%	Species not included in collision risk modelling	The assessment of collision risk was undertaken on a qualitative basis by investigating flight heights of birds at the project site and was undertaken for species considered to be of International or National importance in the context of the assessments undertaken for the project. Herring gull was not considered to be a species of International or National importance. Surveys of the project comprised aerial and boat-based surveys both of which were undertaken during winter months (aerial = November to April and boat-based = December and February). Aerial surveys covered a large area encompassing the Liverpool Bay SPA with boat-based surveys covering the project area. The surveys were undertaken to provide abundance and distribution data for those species considered to be of most importance, namely common scoter and red-throated diver. Herring gull was not recorded during boat-based surveys with relatively low numbers recorded during aerial surveys.	No assessment was conducted for herring gull in relation to collision risk impacts however, for herring gull was not considered to be a species of International or National importance in the context of the assessments undertaken. The herring gull feature of the Morecambe Bay and Duddon Estuary SPA / Morecambe Bay Ramsar site was not specifically considered in the assessments presented.
Walney 1 & 2 (RPS, 2006a)	Breeding and non-breeding season. Apportioning value in the breeding season unknown (however, see paragraphs 1.6.3.81 to 1.6.3.82)	Species not included in collision risk modelling	Site-specific surveys included boat-based surveys undertaken across an area of 512 km^2 in the vicinity of the project between May 2004 and September 2005. The project also utilised survey data collected by regional aerial surveys, undertaken across the NW3 aerial survey area between 2002 and 2006 and radar survey data collected between 01 October and 29 October 2005. The peak population of herring gull recorded in the project area plus 2 km buffer during aerial surveys was 47 birds. In boat-based surveys the equivalent	Low significance on an EIA basis. A significant impact on SPA populations was not predicted for the Walney 1 & 2 project alone or in-combination with other projects.

Project	Connectivity	Reason for estimates being unavailable	Qualitative assessment	Final conclusion
	Apportioning value in the non-breeding season = 1.6%		population was 78 birds. The proportion of flying herring gulls recorded above 15 m was 21.1 % across all boat-based surveys, although the total number of flying birds was low (90 records). Herring gull was deemed to be a species of very high importance due to SPA connectivity (termed sensitivity in the Walney 1 & 2 assessments). Herring gull was not included in collision risk modelling, and it was considered that, due to the very low numbers of birds recorded at rotor height, that the magnitude of collision was negligible.	
West of Duddon Sands (RPS, 2006b)	Breeding and non-breeding season. Apportioning value in the breeding season unknown (however, see paragraphs 1.6.3.81 to 1.6.3.82) Apportioning value in the non-breeding season = 1.6%	Species not included in collision risk modelling	Site-specific surveys included boat-based surveys undertaken across an area of 512 km^2 in the vicinity of the project between May 2004 and September 2005. The project also utilised survey data collected by regional aerial surveys, undertaken across the NW3 aerial survey area between 2002 and 2006 and radar survey data collected between 01 October and 29 October 2005. The peak population of herring gull recorded in the project area plus 2 km buffer during aerial surveys was six birds. In boat-based surveys the equivalent population was 1,562 birds. The proportion of flying herring gulls recorded above 15 m was 21.1 % across all boat-based surveys, although the total number of flying birds was low (90 records). Herring gull was deemed to be a species of very high importance due to SPA connectivity (termed sensitivity in the West of Duddon Sands assessments). Herring gull was not included in collision risk modelling, and it was considered that, due to the very low numbers of birds recorded at rotor height, that the magnitude of collision was negligible.	Low significance on an EIA basis. The herring gull feature of the Morecambe Bay and Duddon Estuary SPA / Morecambe Bay Ramsar site was not specifically assessed in the assessments presented.

Project	Connectivity	Reason for estimates being unavailable	Qualitative assessment	Final conclusion
Gwynt y Môr (RWE Group and Npower Renewables, 2005)	Breeding and non-breeding season. Apportioning value in the breeding season unknown (however, see paragraphs 1.6.3.81 to 1.6.3.82) Apportioning value in the non-breeding season = 1.6%		Site-specific surveys undertaken in support of the project included boat-based surveys undertaken between February 2003 and March 2005. Surveys between February 2003 and February 2004 covered a large area along the Welsh coast incorporating the project area with surveys between March 2004 and March 2005 more focussed on the project area. The assessment also used data from aerial surveys undertaken between 2000 and 2005 which were targeted at recording common scoter. During boat-based surveys used to characterise the project undertaken between 2004 to 2005, covering an area considered by the project assessment to better represent the behaviour of birds than in 2003 to 2004, 8,900 observations were obtained with only 22 flights recorded at a height of greater than 20 m. In 2004 to 2005 surveys, 225 herring gulls were recorded in flight with only 1.3% of these flying above 20 m.	Low significance due to low proportion of flight heights recorded at collision height. The herring gull feature of the Morecambe Bay and Duddon Estuary SPA / Morecambe Bay Ramsar site was not specifically assessed in the assessments presented.

Scenario 1: Morgan Generation Assets together with the Morgan and Morecambe Offshore Wind Farms: Transmission Assets

1.6.3.76 Collision risk is not an impact pathway associated with the Morgan and Morecambe Offshore Wind Farms: Transmission Assets. There is therefore considered to be no change to the assessments conducted in the Integrity test: Step 1 for the Morgan Generation Assets alone and a conclusion of no adverse effect on the integrity of the herring gull feature of the Morecambe Bay and Duddon Estuary SPA / Morecambe Bay Ramsar site is reached. Further information on specific conservation objectives is provided in Table 1.73.

Scenario 2: Morgan Generation Assets together with the Morecambe Offshore Windfarm Generation Assets and the Morgan and Morecambe Offshore Wind Farms: Transmission Assets

1.6.3.77 The total collision risk for the Morgan Generation Assets and Morecambe Generation Assets apportioned to the herring gull population at the Morecambe Bay and Duddon Estuary SPA is 0.3 to 0.4 birds. This represents a 0.13% to 0.16% increase in the baseline mortality of the SPA population.

1.6.3.78 Based on the approach taken in the integrity test: Step 1 this is not considered to represent an AEOI of the herring gull feature of the Morecambe Bay and Duddon Estuary SPA / Morecambe Bay Ramsar site.

Scenario 3: Tier 1, Tier 2 and Tier 3: Morgan Generation Assets together with the Morgan and Morecambe Offshore Wind Farms: Transmission Assets and other relevant projects and plans.

1.6.3.79 The total collision risk for the Morgan Generation Assets and other projects apportioned to the herring gull population at the Morecambe Bay and Duddon Estuary SPA is 15.2 birds. This represents a 5.9% increase in the baseline mortality of the SPA population. When applying the assumptions advocated by Natural England the total collision risk is 19.4 collisions/annum. This represents a 7.5% increase in the baseline mortality of the SPA population. However, there are several reasons, including a lack of connectivity between birds from the SPA and projects considered in-combination, why these figures are considered to be unrealistically high as discussed below.

1.6.3.80 The current population at the Morecambe Bay and Duddon Estuary SPA / Morecambe Bay Ramsar site is significantly smaller than the cited population. The main colony within the SPA, at South Walney, has decreased from a peak of 19,246 breeding pairs in 1987 to 770 breeding pairs in 2023. It should be noted however, that this is not the lowest population recorded at the SPA with this occurring in 2021 (263 breeding pairs). These declines are predominantly due to increased predation by foxes and badgers. In 2020/2021 a permanent predator-proof fence was installed and then heightened and strengthened in the winter of 2021/22 (Cumbria Wildlife Trust, 2022). This has seen the colony increase from 263 breeding pairs to 770 breeding pairs with breeding productivity also slowly increasing (JNCC *et al.,* 2023). This increase has occurred whilst many of the projects considered within the in-combination assessment have been operational.

1.6.3.81 The generic apportioning approach, applied in the breeding season as part of the assessments presented for a number of projects considered in-combination assumes that foraging trips undertaken by herring gulls extend into the marine environment by applying generic foraging ranges from Woodward *et al.* (2019). Tracking studies show that herring gulls from the SPA make limited use of the offshore environment (Thaxter *et al.* 2017) preferring to utilise the area immediately around the colony most frequently. Birds also utilise terrestrial and intertidal habitats as well as nearby mussel

beds to the south of Barrow-in-Furness and birds have been recorded extensively using the South Walney and Piel Channel Flats SSSI (Thaxter *et al.,* 2017; Natural England, 2023a). Birds can also frequently be found on intertidal mud flats, as well as nearby fields, rubbish dumps and bodies of freshwater.

1.6.3.82 It is therefore considered that the impact on herring gulls from the Morecambe Bay and Duddon Estuary SPA / Morecambe Bay Ramsar site is significantly lower than predicted in Table 1.70. If impacts in the breeding season are excluded based on the information in Thaxter *et al.* (2017), this provides an in-combination total of 0.8 collisions/annum (1.0 collisions/annum when applying Natural England's assumptions). This represents a 0.32% increase in the baseline mortality of the SPA population, or a 0.40% increase when applying Natural England's assumptions.

1.6.3.83 If the apportioning values calculated utilising the generic apportioning approach, or any other approach for older projects, are considered appropriate then it is important to note that these approaches are unlikely to have accounted for immature and sabbatical birds. These components of the population can represent a significant proportion. For example, within the site-specific surveys for the Morgan Generation Assets, the proportion of immature herring gulls was 68.85% and Horswill and Robinson (2015) indicate that the proportion of sabbatical herring gulls in the population is 35%. This would represent significant reductions in the breeding season impacts predicted in Table 1.66.

1.6.3.84 Consideration has also been given to the differences in impact magnitude that occur between turbine scenarios that are assessed as part of project applications and those that are eventually built (as-built scenarios) (Table 1.72). If the collision risk estimates associated with the as-built turbine scenarios for all projects considered as part of the in-combination assessment were used, it is likely that the in-combination total would be significantly reduced and therefore represent an even smaller proportion of the baseline mortality of the SPA population. Walney Extension and Burbo Bank Extension are the biggest contributors to the in-combination total, and it is anticipated that these impacts are, in reality, significantly lower.

Table 1.72: Comparison of differences being assessed and as-built turbine scenario for projects considered in-combination.

Project	Assessed turbine scenario	As-built turbine scenario	Collision risk estimate used in assessments	Likely impact on collision risk estimates due to change in turbine scenario
Burbo Bank Extension	69 x 3.6 MW	32 x 8 MW	0.9 to 1.2	Significant reduction. Fewer turbines, larger turbine
Walney 3 + 4	207 x 3.6 MW with a lower tip height of 22 m	87 turbines with capacities of 7 and 8 MW with a lower tip height of 34 and 31 m	13.7 to 17.4	Significant reduction. The as-built scenario at Walney Extension consists of fewer, larger, higher turbines. Updated collision risk modelling for Walney Extension has shown significant reductions in the associated collision risk (Wheeldon et al., 2023).

1.6.3.85 If the collision risk estimates associated with the as-built turbine scenarios for all projects considered as part of the in-combination assessment were used, it is likely that the in-combination total would fall further and therefore represent an even smaller proportion of the baseline mortality of the SPA population.

1.6.3.86 When taking into account the following elements of the assessment as discussed above it is considered that the collision total associated with the Morgan Generation Assets in-combination with other projects will not surpass the 1% baseline mortality threshold of the herring gull population at the Morecambe Bay and Duddon Estuary SPA:

- No connectivity between herring gulls from the SPA in the breeding and any project considered in-combination based on tracking data of birds from the SPA. When breeding season impacts are excluded under any scenario, the associated impact represents less than 1% of the baseline mortality of the SPA population. This factor decreases the in-combination impact below the 1% threshold of baseline mortality of the SPA population without consideration of further factors.
- It is considered that an avoidance rate of 99.52% is appropriate for herring gull based on the information presented in Ozsanlav-Harris *et al.* (2023) (see Volume 4, Annex 5.3: Offshore Ornithology Collision Risk Modelling Technical Report)
- It is considered that the flight speed information provided by Skov *et al.* (2018) provides a far more robust appraisal of herring gull flight behaviour than any other source of flight height data (see Volume 4, Annex 5.3: Offshore Ornithology Collision Risk Modelling Technical Report)
- Use of collision risk estimates that represent the assessed turbine scenario at projects that make a significant contribution. The total potential in-combination impact, with the use of as-built scenarios leading to significant reductions in collision risk estimates.

1.6.3.87 It is also of note that the herring gull population of the SPA has increased considerably since the introduction of predator prevention measures at the SPA which occurred whilst the majority of the projects considered in-combination were in operation. Following the methodology applied in the integrity test: Step 1 it is therefore considered that there is no AEOI integrity of the Morecambe Bay and Duddon Estuary SPA / Morecambe Bay Ramsar site as a result of in-combination collision impacts on herring gull.

1.6.3.88 An assessment against the conservation objectives for the herring gull feature of the Morecambe Bay to Duddon Estuary SPA is provided in Table 1.73. These conclusions are also considered applicable to the breeding seabird assemblage of the SPA and to the qualifying features of the Morecambe Bay Ramsar site.

Table 1.73: Conclusions against the conservation objectives of the herring gull qualifying feature of the Morecambe Bay and Duddon Estuary SPA / Morecambe Bay Ramsar site for in-combination collision risk impacts.

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Tier 1, Tier 2, Tier 3 projects
Construction			
The extent and distribution of the habitats of the qualifying features are maintained or restored	• There is no impact pathway for this conservation objective.	• There is no impact pathway for this conservation objective.	• There is no impact pathway for this conservation objective.
The structure and function of the habitats of the qualifying features are maintained or restored			
The supporting processes on which the habitats of the qualifying features rely are maintained or restored			
The population of each of the qualifying features are maintained or restored	• Collision risk impacts are not applicable to the Morgan and Morecambe Offshore Wind Farms: Transmission Assets and therefore the assessment undertaken for the Morgan Generation Assets alone in section 1.5 remains unchanged.	• Potential impacts from the Morgan Generation Assets, and Morecambe Generation Assets on the herring gull feature of the Morecambe Bay and Duddon Estuary SPA will occur throughout the annual cycle. However, tracking data from the SPA suggests no connectivity between these two projects and birds from the SPA during the breeding season. The predicted in-combination impact is considered to represent less than a 1% increase in the baseline mortality of the SPA population. • Herring gull is sensitive to collision risk impacts (Wade *et al.,* 2016) however, the magnitude of predicted impacts	• Potential impacts from the Morgan Generation Assets, and all other projects considered in-combination on the herring gull feature of the Morecambe Bay and Duddon Estuary SPA will occur throughout the annual cycle. However, tracking data from the SPA suggests limited connectivity between the marine environment and birds from the SPA during the breeding season and no connectivity with any project considered in-combination. The predicted in-combination impact is therefore considered to represent less than a 1% increase in the baseline mortality of the SPA population. • Herring gull is sensitive to collision risk impacts (Wade *et al.,* 2016) however, the

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Tier 1, Tier 2, Tier 3 projects
		apportioned to the SPA will not exceed the 1% threshold of baseline mortality. Therefore, collision risk during the operations and maintenance phase will not prevent the population of herring gull from being maintained or restored.	magnitude of predicted impacts apportioned to the SPA will not exceed the 1% threshold of baseline mortality. Therefore, collision risk during the operations and maintenance phase will not prevent the population of herring gull from being maintained or restored.
The distribution of the qualifying features within the site are maintained or restored	• Collision risk impacts are not applicable to the Morgan and Morecambe Offshore Wind Farms: Transmission Assets and therefore the assessment undertaken for the Morgan Generation Assets alone in section 1.5 remains unchanged.	• Impacts associated with the Morgan Generation Assets and Morecambe Generation Assets will not directly affect the SPA. The predicted in-combination collision risk total for these two projects will not represent an increase in the baseline mortality of the SPA population of more than 1%. Therefore, collision risk during the operations and maintenance phase will not prevent the distribution of herring gull within the site from being maintained or restored.	• Impacts from the Morgan Generation Assets and all other projects considered in-combination will not directly affect the SPA. The predicted in-combination collision risk total for all projects will not represent an increase in the baseline mortality of the SPA population of more than 1%. Therefore, collision risk during the operations and maintenance phase will not prevent the distribution of herring gull within the site from being maintained or restored.
Conclusion	**Adverse effects on the herring gull qualifying feature, which undermine the conservation objectives of the Morecambe Bay and Duddon Estuary SPA, will not occur as a result of collision risk in-combination with the Morgan and Morecambe Offshore Wind Farms: Transmission Assets**	**Adverse effects on the herring gull qualifying feature, which undermine the conservation objectives of the Morecambe Bay and Duddon Estuary SPA, will not occur as a result of collision risk in-combination with the Morgan and Morecambe Offshore Wind Farms: Transmission Assets and Morecambe Offshore Windfarm Generation Assets.**	**Adverse effects on the herring gull qualifying feature, which undermine the conservation objectives of the Morecambe Bay and Duddon Estuary SPA, will not occur as a result of collision risk in-combination with the Morgan and Morecambe Offshore Wind Farms: Transmission Assets, Morecambe Offshore Windfarm Generation Assets, as well as Tier 1, Tier 2 and Tier 3 projects.**

Isles of Scilly SPA / Isles of Scilly Ramsar site

Great black-backed gull

1.6.3.89 Based on the mean-maximum foraging range +1SD of great black-backed gull (Woodward *et al*., 2019) from the Isles of Scilly SPA / Isles of Scilly Ramsar site, there is one project within foraging range of great black-backed gull from the SPA during the breeding season (the Twinhub offshore wind farm). In the non-breeding season, there are further projects within the BDMPS of relevance to the species (Furness, 2015).

1.6.3.90 Table 1.74 presents the collision risk estimates for those projects for which quantified estimates can be obtained. These values represent the number of collisions apportioned to the great black-backed gull population of the Isles of Scilly SPA / Isles of Scilly Ramsar site utilising a 99.91% avoidance rate. As discussed in Volume 4, Annex 5.3: Offshore Ornithology Collision Risk Modelling Technical Report of the Environmental Statement, the use of this species-specific avoidance rate from Ozsanlav-Harris *et al.* (2023) (instead of the grouped value presented in Ozsanlav-Harris *et al.,* 2023) is considered to provide a more accurate appraisal of the likely collision risk for great black-backed gull. In addition collision risk estimates are presented utilising an avoidance rate of 99.39%, as advocated by Natural England and, for the Morgan Generation Assets, represent collision risk estimates calculated using parameters as advocated by Natural England.

1.6.3.91 Apportioning values for the breeding season have been taken from project-specific documentation, where available. If unavailable an apportioning value from the nearest project for which an apportioning value is available has been applied. In the non-breeding season, apportioning values calculated using information from Furness (2015) has been applied to collision risk estimates from all projects. There are a number of projects for which there are no, or limited, data on the number of predicted collisions. For some of these projects qualitative assessments were conducted and these are summarised in Table 1.75.

Table 1.74: Predicted annual breeding season mortality rate of great black-backed gull at the Isles of Scilly SPA / Isles of Scilly Ramsar site resulting from collision risk from projects considered in-combination.

Project	Seasonal apportioning values		Seasonal apportioned collision impacts (99.39% avoidance rate)		Seasonal apportioned collision impacts (99.91% avoidance rate)	
	Breeding	Non-breeding	Breeding	Non-breeding	Breeding	Non-breeding
Awel y Môr	No connectivity	0.091	-	0.1	-	0.0
Erebus	No connectivity	0.091	-	0.1	-	0.0
Mona Offshore Wind Project	No connectivity	0.091	-	0.3	-	0.0
Morecambe Offshore Wind Farm: Generation Assets	No connectivity	0.091	-	0.0	-	0.0

Project	Seasonal apportioning values		Seasonal apportioned collision impacts (99.39% avoidance rate)		Seasonal apportioned collision impacts (99.91% avoidance rate)	
	Breeding	Non-breeding	Breeding	Non-breeding	Breeding	Non-breeding
Morgan Generation Assets	No connectivity	0.091	-	0.4	-	0.1
Ormonde	No connectivity	0.091	-	0.0	-	0.0
Rampion	No connectivity	0.091	-	2.4	-	0.4
Rampion 2	No connectivity	0.091	-	1.3	-	0.2
Twinhub	0.414	0.091	2.7	0.8	0.1	0.1
Walney 3 + 4	No connectivity	0.091	-	2.7	-	0.4
White Cross	No connectivity	0.091	-	0.0	-	0.0
Totals						
Scenario 2			**0.5**		**0.1**	
Scenario 3			**8.8**		**1.3**	

Table 1.75: Qualitative assessment of projects considered in-combination with the Morgan Generation Assets for which quantitative consideration of collision risk was not undertaken in project-specific documentation for great black-backed gull.

Project	Reason for estimates being unavailable	Qualitative assessment	Final conclusion
Burbo Bank (Seascape Energy Ltd., 2002)	Species not included in collision risk modelling	The assessment of collision risk was undertaken on a qualitative basis by investigating flight heights of birds at the project site and was undertaken for species considered to be of International or National importance in the context of the assessments undertaken for the project. Great black-backed gull was not considered to be a species of International or National importance. Surveys of the project comprised aerial and boat-based surveys both of which were undertaken during winter months (aerial = November to April and boat-based = December and February). Aerial surveys covered a large area encompassing the Liverpool Bay SPA with boat-based surveys covering the project area. The surveys were undertaken to provide abundance and distribution data for those species considered to be of most importance, namely common scoter and red-throated diver. Great black-backed gull was not recorded during boat-based surveys with relatively low numbers recorded during aerial surveys.	No assessment was conducted for great black-backed gull in relation to collision risk impacts however, for great black-backed gull was not considered to be a species of International or National importance in the context of the assessments undertaken. The great black-backed gull feature of the Isles of Scilly SPA / Isles of Scilly Ramsar site was not specifically considered in the assessments presented.
Burbo Bank Extension (DONG Energy, 2013)	Species not included in collision risk modelling	Collision risk modelling was undertaken however great black-backed gull was not included. Site-specific data consisted of six boat-based surveys undertaken between April and September 2011 and six aerial surveys undertaken between November 2010 and April 2011. The peak population of great black-backed gull recorded during boat-based surveys was 18 bids with an average of eight birds. During aerial surveys, great black-backed gulls were recorded in all but one but in small numbers (peak population of 90 birds). The species was considered to be of regional/local importance in the context of the assessment for the project.	No assessment was conducted for great black-backed gull in relation to collision risk impacts. The great black-backed gull feature of the Isles of Scilly SPA / Isles of Scilly Ramsar site was not specifically considered in the assessments presented.

Project	Reason for estimates being unavailable	Qualitative assessment	Final conclusion
Walney 1 & 2 (RPS, 2006a)	Species not included in collision risk modelling	Site-specific surveys included boat-based surveys undertaken across an area of 512 km^2 in the vicinity of the project between May 2004 and September 2005. The project also utilised survey data collected by regional aerial surveys, undertaken across the NW3 aerial survey area between 2002 and 2006 and radar survey data collected between 01 October and 29 October 2005. The peak population of great black-backed gull recorded in the project area plus 2 km buffer during aerial surveys was 43 birds. In boat-based surveys the equivalent population was 65 birds. The proportion of flying great black-backed gulls recorded above 15 m was 28.7 % across all boat-based surveys, although the total number of flying birds was low (108 records). Great black-backed gull was deemed to be a species of medium importance (termed sensitivity in the Walney 1 & 2 assessments). Great black-backed gull was not included in collision risk modelling, and it was considered that, due to the very low numbers of birds recorded at rotor height, that the magnitude of collision was negligible.	Very low significance on an EIA basis. The great black-backed gull feature of the Isles of Scilly SPA / Isles of Scilly Ramsar site was not specifically considered in the assessments presented.
West of Duddon Sands (RPS, 2006b)	Species not included in collision risk modelling	Site-specific surveys included boat-based surveys undertaken across an area of 512 km^2 in the vicinity of the project between May 2004 and September 2005. The project also utilised survey data collected by regional aerial surveys, undertaken across the NW3 aerial survey area between 2002 and 2006 and radar survey data collected between 01 October and 29 October 2005. The peak population of great black-backed gull recorded in the project area plus 2 km buffer during aerial surveys was 2 birds. In boat-based surveys the equivalent population was 661 birds. The proportion of flying great black-backed gulls recorded above 15 m was 28.7 % across all boat-based surveys, although the total number of flying birds was low (108 records). Great black-backed gull was deemed to be a species of medium importance (termed sensitivity in the West of Duddon Sands assessments).	Very low significance on an EIA basis. The great black-backed gull feature of the Isles of Scilly SPA / Isles of Scilly Ramsar site was not specifically considered in the assessments presented.

Project	Reason for estimates being unavailable	Qualitative assessment	Final conclusion
Gwynt y Môr (RWE Group and Npower Renewables, 2005)	Species not included in collision risk modelling	Site-specific surveys undertaken in support of the project included boat-based surveys undertaken between February 2003 and March 2005. Surveys between February 2003 and February 2004 covered a large area along the Welsh coast incorporating the project area with surveys between March 2004 and March 2005 more focussed on the project area. The assessment also used data from aerial surveys undertaken between 2000 and 2005 which were targeted at recording common scoter. During boat-based surveys used to characterise the project undertaken between 2004 to 2005, covering an area considered by the project assessment to better represent the behaviour of birds than in 2003 to 2004, 8,900 observations were obtained with only 22 flights recorded at a height of greater than 20 m. In 2004 to 2005 surveys, 70 great black-backed gull were recorded in flight with only 2.9% of these flying above 20 m.	Low significance due to low proportion of flight heights recorded at collision height on an EIA basis. The great black-backed gull feature of the Isles of Scilly SPA / Isles of Scilly Ramsar site was not specifically considered in the assessments presented.

Scenario 1: Morgan Generation Assets together with the Morgan and Morecambe Offshore Wind Farms: Transmission Assets

1.6.3.92 Collision risk is not an impact pathway associated with the Morgan and Morecambe Offshore Wind Farms: Transmission Assets. There is therefore considered to be no change to the assessments conducted in the Integrity test: Step 1 for the Morgan Generation Assets alone and a conclusion of no adverse effect on the integrity of the great black-backed gull feature of the Isles of Scilly SPA / Isles of Scilly Ramsar site is reached. Further information on specific conservation objectives is provided in Table 1.77.

Scenario 2: Morgan Generation Assets together with the Morecambe Offshore Windfarm Generation Assets and the Morgan and Morecambe Offshore Wind Farms: Transmission Assets

1.6.3.93 The total collision risk for the Morgan Generation Assets and Morecambe Generation Assets apportioned to the great black-backed gull feature of the Isles of Scilly SPA is 0.1 collisions/annum. This represents a 0.05% increase in the baseline mortality of the SPA population. When applying the assumptions advocated by Natural England the total collision risk is 0.5 collisions/annum. This represents a 0.40% increase in the baseline mortality of the SPA population.

1.6.3.94 Based on the approach taken in the integrity test: Step 1 this is not considered to represent an adverse effect on the site integrity of the great black-backed gull feature of the Isles of Scilly SPA / Isles of Scilly Ramsar site.

Scenario 3: Tier 1, Tier 2 and Tier 3: Morgan Generation Assets together with the Morgan and Morecambe Offshore Wind Farms: Transmission Assets and other relevant projects and plans.

1.6.3.95 The total collision risk for the Morgan Generation Assets and other projects apportioned to the great black-backed gull population at the Isles of Scilly SPA / Isles of Scilly Ramsar site is 1.3 collisions/annum. This represents a 1.14% increase in the baseline mortality of the SPA population. When applying the assumptions advocated by Natural England the total collision risk is 8.8 collisions/annum. This represents a 7.8% increase in the baseline mortality of the SPA population. However, there are several reasons, including a lack of connectivity between birds from the SPA and projects considered in-combination, why these figures are considered to be unrealistically high as discussed below.

1.6.3.96 Two PVA models have been run for the great black-backed gull breeding population at the Isles of Scilly SPA which incorporate different survival rates. The first of these rates is based on guidance in Horswill and Robinson (2015) which suggests the use of survival data for other large gull species (in this case survival rate data for herring gull has been used). The second rate represents survival data reported as part of the BTO's Retrap Adult Survival project which has been collected subsequent to the publication of Horswill and Robinson (2015) which is considered to be of moderate quality and providing a relatively accurate survival trend (BTO, 2024).

1.6.3.97 When assuming an impact of 1.3 collisions/annum the model predicts a median counterfactual of growth rate of 0.986 after 35 years (for both models). Under this impact scenario, the predicted counterfactual median impacted population size would be approximately 60.6-61.2%% of that which the model predicts would occur in the absence of any additional impact after 35 years. This is a relative reduction in population size (compared to that which might otherwise have arisen). The model predicts a positive growth rate, and so the impacted population after 35 years would

still be larger than that which was assumed for the initiation of the modelling exercise (i.e. the most recent population at the SPA).

1.6.3.98 When assuming an impact of 8.8 collisions/annum the model predicts a median counterfactual of growth rate of 0.906-0.908 after 35 years. Under this impact scenario, the predicted counterfactual median impacted population size would be approximately 2.8-3.1% of that which the model predicts would occur in the absence of any additional impact after 35 years. This is a relative reduction in population size (compared to that which might otherwise have arisen). The model predicts a negative growth rate, and so the impacted population after 35 years would be smaller than that which was assumed for the initiation of the modelling exercise (i.e. the most recent population at the SPA).

1.6.3.99 There are a number of uncertainties associated with the PVA modelling, these include:

- Over-estimation of in-combination impacts. The PVA modelling does not account for changes in the predicted in-combination due to the decommissioning of projects considered in-combination. Over the lifetime of the Plan the in-combination impact will reduce significantly when licences for current projects expire and decommissioning occurs. The PVA metrics are therefore highly precautionary.
- No consideration has been made for density dependent compensation of demographic parameters within the modelled population, nor immigration, both of which could reduce the magnitude of any population change.

1.6.3.100 The current population of great black-backed gull at the Isles of Scilly SPA / Isles of Scilly Ramsar site is lower than when the SPA was designated. The citation population was 1,882 breeding adults with this having decreased to 1,618 breeding adults during the Seabirds Count census (2015 to 2021). Interim results for 2023 (which have not been included in the assessment due to their interim nature) suggest a further decline to 1,214 breeding adults (Isles of Scilly Wildlife Trust, 2023). The breeding population had increased up until 2015 with a decline in the last eight year reflecting the UK trend for this species since 2000. It is thought that the decline is due to a reduction in discards and offal from fishing vessels (JNCC, 2021).

1.6.3.101 The apportioning values calculated in the non-breeding season utilise population data from Furness (2015) and assume that birds from SPAs of relevance to a BDMPS area are equally distributed throughout the BDMPS. Projects in the Irish Sea are located close to the boundary between the South-west and Channel BDMPS and West of Scotland BDMPS. The South-west and Channel BDMPS is considered to contain 90% of the great black-backed gull population from the Isles of Scilly in the non-breeding season however, no great black-backed gulls from the Isles of Scilly are considered to be present in the West of Scotland BDMPS in the same period. Ring recovery information presented in Wernham *et al.* (2002) suggests limited connectivity between birds breeding in the south-west of England and the Irish Sea. Breeding great black-backed gulls in the UK are predominantly sedentary and are rarely found far from breeding locations. Immature great black-backed gulls disperse further than adult birds. The median distance moved by adult birds is 54.5 km, suggesting no connectivity between the Isles of Scilly and the Irish Sea, whilst for immature birds the median distance is 115 km (Wernham *et al.,* 2002). It is therefore considered highly likely that projects located in the Irish Sea do not contribute to in-combination impacts on the great black-backed gull population of the Isles of Scilly SPA.

1.6.3.102 Avoidance rates for great black-backed gull used in collision risk modelling have been taken from Ozsanlav-Harris *et al.* (2023). The research conducted by Ozsanlav-Harris *et al*. (2023) reviews the approach to calculate the avoidance rate of specific species

and groupings, comparing this to the approach by Cook (2021). The Ozsanlav-Harris *et al*. (2023) dataset contains information on collision data from 23 monitoring reports of 19 wind farms (including one offshore), encompassing 11 species or species groups spanning the years 2000 to 2019. Cook (2021) suggests that a minimum of 10 sites may be used as an arbitrary threshold sample size to inform the selection of species-specific avoidance rates over group-specific estimates. This threshold is surpassed by the dataset for great black-backed gull used in The Ozsanlav-Harris *et al*. (2023) to calculate species-specific avoidance rates. It is therefore considered that the species-specific rate, specifically for great black-backed gull, represents the best available evidence for use in collision risk modelling.

1.6.3.103 In addition, Volume 4, Annex 5.3: Offshore Ornithology Collision Risk Modelling Technical Report of the Environmental Statement reviews the evidence supporting the use of different flight speeds in collision risk modelling for great black-backed gull. Based on the evidence presented in Volume 4, Annex 5.3: Offshore Ornithology Collision Risk Modelling Technical Report of the Environmental Statement it is considered that the best available evidence in relation to flight speed for great black-backed gull is the value presented by Skov *et al.* (2018) with this value supported by a larger sample size collected across all seasons than the value presented by Alerstam *et al.* (2007). The data associated with Skov *et al.* (2018) were also collected in UK waters in an area of sea that is considered similar to that in which the Morgan Generation Assets are located (i.e. not close to large breeding colonies) and more is known about the methodology employed to capture flight speed data. The value presented by Alerstam *et al.* (2007) is not considered representative of the flight speed of great black-backed gull due to the limited sample size and restricted seasonal coverage and it is therefore considered that it should not be used for collision risk modelling. It is important to note that the avoidance rates calculated in Ozsanlav-Harris *et al*. (2023) utilise the flight speed data from Alerstam *et al.* (2007) to derive avoidance rates. This therefore introduces an element of uncertainty in collision risk modelling that may deviate from the use of flight speed data from Alerstam *et al.* (2007). However, the flight speeds from Alerstam *et al.* (2007) are not appropriate for use in collision risk modelling, as discussed in Volume 4, Annex 5.3: Offshore Ornithology Collision Risk Modelling Technical Report of the Environmental Statement, and it is considered that the use of these flight speed data introduces a much greater level of uncertainty in collision risk estimates calculated using those data.

1.6.3.104 The use of species-specific avoidance rates and more robust flight speeds from Skov *et al.* (2018) has a significant effect on the collision risk estimates not only for the Morgan Generation Assets, as illustrated in Table 1.74 but also for projects considered in-combination. Whilst differences in avoidance rates can be addressed through a simple correction, updating collision risk estimates to account for differences in flight speed is more complex and, to provide an accurate estimate, would require updated modelling. Previous sensitivity analyses have shown that changes in flight speed from Alerstam *et al.* (2007) to Skov *et al.* (2018) can reduce collision risk estimates for great black-backed gull by 19.7% (Ørsted, 2018).

1.6.3.105 Consideration has also been given to the differences in impact magnitude that occur between turbine scenarios that are assessed as part of project applications and those that are eventually built (as-built scenarios) (Table 1.76). If the collision risk estimates associated with the as-built turbine scenarios for all projects considered as part of the in-combination assessment were used, it is likely that the in-combination total would be significantly reduced and therefore represent an even smaller proportion of the baseline mortality of the SPA population. Walney Extension is one of the biggest

contributors to the in-combination total, and it is anticipated that these impacts are, in reality, significantly lower.

Table 1.76: Comparison of differences being assessed and as-built turbine scenario for projects considered in-combination.

Project	Assessed turbine scenario	As-built turbine scenario	Collision risk estimate used in assessments	Likely impact on collision risk estimates due to change in turbine scenario
Rampion	175 x 4 MW with a lower tip height of 35 m	116 x 3.45 MW with a lower tip height of 28 m	0.4 - 2.4	Likely no change. Reduction in the number of turbines likely balanced by increase in risk from the smaller turbine model and decreased lower tip height
Walney 3 + 4	207 x 3.6 MW with a lower tip height of 22 m	87 turbines with capacities of 7 and 8 MW with a lower tip height of 34 and 31 m	0.4 - 2.7	Significant reduction. The as-built scenario at Walney Extension consists of fewer, larger, higher turbines. Updated collision risk modelling for Walney Extension has shown significant reductions in the associated collision risk (Wheeldon et al., 2023).

1.6.3.106 If the collision risk estimates associated with the as-built turbine scenarios for all projects considered as part of the in-combination assessment were used, it is likely that the in-combination total would fall further and therefore represent an even smaller proportion of the baseline mortality of the SPA population.

1.6.3.107 When taking into account the following elements of the assessment as discussed above it is considered that the collision total associated with the Morgan Generation Assets in-combination with other projects will not surpass the 1% baseline mortality threshold of the great black-backed gull population at the Isles of Scilly SPA:

- No connectivity between great black-backed gulls from the SPA and projects in the Irish Sea during the non-breeding season a reduction of 0.5 to 3.5 collisions/annum
- It is considered that an avoidance rate of 99.91% is appropriate for great black-backed gull based on the information presented in Ozsanlav-Harris *et al.* (2023) (see Volume 4, Annex 5.3: Offshore Ornithology Collision Risk Modelling Technical Report)
- It is considered that the flight speed information provided by Skov *et al.* (2018) provides a far more robust appraisal of great black-backed gull flight behaviour than any other source of flight height data (see Volume 4, Annex 5.3: Offshore Ornithology Collision Risk Modelling Technical Report)
- Use of collision risk estimates that represent the assessed turbine scenario at projects that make a significant contribution The total potential in-combination

impact, with the use of as-built scenarios leading to significant reductions in collision risk estimates.

1.6.3.108 Following the methodology applied in the integrity test: Step 1 it is therefore considered that there is no AEOI of the Isles of Scilly SPA / Isles of Scilly Ramsar site as a result of in-combination collision impacts on great black-backed gull.

1.6.3.109 An assessment against the conservation objectives for the great black-backed gull feature of the Isles of Scilly SPA is provided in Table 1.77. These conclusions are also considered applicable to the breeding seabird assemblage of the SPA and to the qualifying features of the Isles of Scilly Ramsar site.

Table 1.77: Conclusions against the conservation objectives of the great black-backed gull qualifying feature of the Isles of Scilly SPA / Isles of Scilly Ramsar site for in-combination collision risk impacts.

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Tier 1, Tier 2, Tier 3 projects
Construction			
The extent and distribution of the habitats of the qualifying features are maintained or restored	There is no impact pathway for this conservation objective.	There is no impact pathway for this conservation objective.	There is no impact pathway for this conservation objective.
The structure and function of the habitats of the qualifying features are maintained or restored			
The supporting processes on which the habitats of the qualifying features rely are maintained or restored			
The population of each of the qualifying features are maintained or restored	Collision risk impacts are not applicable to the Morgan and Morecambe Offshore Wind Farms: Transmission Assets and therefore the assessment undertaken for the Morgan Generation Assets alone in section 1.5 remains unchanged.	Potential impacts from the Morgan Generation Assets, and Morecambe Generation Assets on the great black-backed gull feature of the Isles of Scilly SPA may occur in the non-breeding season only. However, it is considered, based on the information presented in Wernham et al. (2002) that there is no connectivity between the Irish Sea and great black-backed gulls from the Isles of Scilly SPA and therefore no contribution to the existing in-combination impact. With the inclusion of other factors it is considered that the predicted in-combination impact will represent less than a 1% increase in the baseline mortality of the SPA population.	Potential impacts from the Morgan Generation Assets, and all other projects considered in-combination on the great black-backed gull feature of the Isles of Scilly SPA will occur throughout the annual cycle for some projects with the majority of projects only having connectivity in the non-breeding season. However, it is considered, based on the information presented in Wernham et al. (2002) that there is no connectivity between the Irish Sea and great black-backed gulls from the Isles of Scilly SPA and therefore no contribution to the existing in-combination impact. With the inclusion of other factors it is considered that the predicted in-combination impact will

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Tier 1, Tier 2, Tier 3 projects
		Great black-backed gull is sensitive to collision risk impacts (Wade *et al.,* 2016) however, the magnitude of predicted impacts apportioned to the SPA will not exceed the 1% threshold of baseline mortality. Therefore, collision risk during the operations and maintenance phase will not prevent the population of great black-backed gull from being maintained or restored.	represent less than a 1% increase in the baseline mortality of the SPA population. Great black-backed gull is sensitive to collision risk impacts (Wade *et al.,* 2016) however, the magnitude of predicted impacts apportioned to the SPA will not exceed the 1% threshold of baseline mortality. Therefore, collision risk during the operations and maintenance phase will not prevent the population of great black-backed gull from being maintained or restored.
The distribution of the qualifying features within the site are maintained or restored	Collision risk impacts are not applicable to the Morgan and Morecambe Offshore Wind Farms: Transmission Assets and therefore the assessment undertaken for the Morgan Generation Assets alone in section 1.5 remains unchanged.	Impacts associated with the Morgan Generation Assets and Morecambe Generation Assets will not directly affect the SPA. The predicted in-combination collision risk total for these two projects will not represent an increase in the baseline mortality of the SPA population of more than 1%. Therefore, collision risk during the operations and maintenance phase will not prevent the distribution of great black-backed gull within the site from being maintained or restored.	Impacts associated with the Morgan Generation Assets and Morecambe Generation Assets will not directly affect the SPA. The predicted in-combination collision risk total for these two projects will not represent an increase in the baseline mortality of the SPA population of more than 1%. Therefore, collision risk during the operations and maintenance phase will not prevent the distribution of great black-backed gull within the site from being maintained or restored.
Conclusion	**Adverse effects on the great black-backed gull qualifying feature, which undermine the conservation objectives of the Isles of Scilly SPA, will not occur as a result of collision risk in-combination with the Morgan and Morecambe Offshore Wind Farms: Transmission Assets**	**Adverse effects on the great black-backed gull qualifying feature, which undermine the conservation objectives of the Isles of Scilly SPA, will not occur as a result of collision risk in-combination with the Morgan and Morecambe Offshore Wind Farms: Transmission Assets and Morecambe Offshore Windfarm Generation Assets.**	**Adverse effects on the great black-backed gull qualifying feature, which undermine the conservation objectives of the Isles of Scilly SPA, will not occur as a result of collision risk in-combination with the Morgan and Morecambe Offshore Wind Farms: Transmission Assets, Morecambe Offshore Windfarm Generation Assets, as well as Tier 1, Tier 2 and Tier 3 projects.**

In-combination combined disturbance and displacement from airborne sound, underwater sound and presence of vessels and infrastructure and collision risk impacts

1.6.3.110 The assessment for in-combination combined disturbance and displacement from airborne sound, underwater sound and presence of vessels and infrastructure and collision risk impacts is presented for the operations and maintenance phase below for the SPAs and associated qualifying feature listed in Table 1.78.

Table 1.78: European sites and relevant offshore ornithological features from which the potential for an adverse effect could not be ruled out in relation to in-combination combined disturbance and displacement from airborne sound, underwater sound and presence of vessels and infrastructure and collision risk impacts.

European site	Offshore ornithological features
Ireland's Eye SPA	Kittiwake.
Cape Wrath SPA	Kittiwake
North-west Irish Sea SPA	Kittiwake

1.6.3.111 For species such as kittiwake, that are both adversely affected by displacement and collision during the operations and maintenance phase, impacts must be combined in order for the true magnitude of impact to be understood.

1.6.3.112 It is recognised that assessing these two potential impacts together could amount to double counting, as birds that are subject to displacement would not be subject to potential collision risk as they are already assumed to have not entered the array area. Equally, birds estimated to be subject to collision risk mortality would not be able to be subjected to displacement consequent mortality as well. As a more refined method to consider displacement and collision together whilst reducing any double counting of impacts is not agreed with SNCBs, the precautionary and highly unlikely approach is presented in this assessment.

Ireland's Eye SPA and North-west Irish Sea SPA

Kittiwake

1.6.3.113 Based on the mean-maximum foraging range +1SD of kittiwake (Woodward *et al*., 2019) from the Ireland's Eye SPA, there are numerous projects within foraging range of kittiwake from the SPA during the breeding season. In the non-breeding season, there are additional projects within the BDMPS of relevance to the species (Furness, 2015).

1.6.3.114 Table 1.79 presents the seasonal abundance values for use in displacement analyses for those projects for which quantified estimates can be obtained.

1.6.3.115 For displacement, population estimates represent the number of kittiwake from the Ireland's Eye SPA. There are a number of projects for which there are no, or limited, data on the number of kittiwake predicted to be displaced. For some of these projects qualitative assessments were conducted and these are summarised in Table 1.80.

1.6.3.116 Apportioning values for the breeding season have been taken from project-specific documentation, where available. If unavailable an apportioning value from the nearest project for which an apportioning value is available has been applied. In the non-breeding season, apportioning values calculated using information from Furness (2015) has been applied to collision risk estimates from all projects.

Table 1.79: Cumulative abundance for kittiwake at the Ireland's Eye SPA for projects considered in-combination in relation to disturbance and displacement from projects.

a – apportioning value unavailable, assumed to be the same as the Morgan Generation Assets

b – apportioning value unavailable, assumed to be the same as Erebus offshore wind farm

Project	Seasonal apportioning values			Seasonal abundance values		
	Breeding	Post-breeding	Pre-breeding	Breeding	Post-breeding	Pre-breeding
Awel y Môr	0.010	0.001	0.001	4.8	0.1	0.3
Burbo Bank Extension	0.013[a]	0.001	0.001	24.4	0.2	0.2
Erebus	0.016	0.001	0.001	0.0	1.3	0.4
Mona Offshore Wind Project	0.016	0.001	0.001	5.7	0.3	0.7
Morecambe Offshore Wind Farm: Generation Assets	0.013[a]	0.001	0.001	48.6	1.6	0.5
Morgan Generation Assets	0.013	0.001	0.001	9.4	0.7	0.6
Ormonde	0.013	0.001	0.001	1.1	Unavailable	
Rampion	No connectivity	0.001	0.001	-	0.3	0.3
Rampion 2	No connectivity	0.001	0.001	-	0.1	0.2
Twinhub	No connectivity	0.001	0.001	-	0.1	Unavailable
Walney 3 + 4	0.013[a]	0.001	0.001	3.0	0.4	0.3
West of Orkney	No connectivity	0.001	0.001	-	0.4	0.2
White Cross	0.016[b]	0.001	0.001	0.7	0.1	0.4
Annual totals						
Scenario 2				**61.4**		
Scenario 3				**116.0**		

Table 1.80: Qualitative assessment of projects considered cumulatively with the Morgan Generation Assets for which quantitative consideration of displacement impacts was not undertaken in project-specific documentation for kittiwake.

Project	Connectivity	Reason for estimates being unavailable	Qualitative assessment	Final conclusion
Tier 1				
Burbo Bank (Seascape Energy Ltd., 2002)	Breeding, post -breeding and pre-breeding season. Apportioning value in the breeding season unknown Apportioning value in the post-breeding season = 0.06% Apportioning value in the pre-breeding season = 0.08%	Disturbance impacts considered qualitatively	Surveys of the project comprised aerial and boat-based surveys both of which were undertaken during winter months (aerial = November to April and boat-based = December and February). Aerial surveys covered a large area encompassing the Liverpool Bay SPA with boat-based surveys covering the project area. The surveys were undertaken to provide abundance and distribution data for those species considered to be of most importance, namely common scoter and red-throated diver. Low numbers of kittiwake were recorded during boat-based surveys with relatively low numbers also recorded during aerial surveys.	Kittiwake was not considered to be a species of International or National importance in the context of the assessments undertaken. Although kittiwake was not specifically assessed due to the species being considered of limited importance, low levels of disturbance were predicted for other species with conclusions of a negligible magnitude and very low significance reached on an EIA basis. Ireland's Eye SPA was not specifically considered in the assessments presented.
Walney 1 & 2 (RPS, 2006a)	Breeding, post -breeding and pre-breeding season. Apportioning value in the breeding season unknown Apportioning value in the post-breeding season = 0.06% Apportioning value in the pre-breeding season = 0.08%	Disturbance impacts considered qualitatively	Site-specific surveys included boat-based surveys undertaken across an area of 512 km^2 in the vicinity of the project between May 2004 and September 2005. The project also utilised survey data collected by regional aerial surveys, undertaken across the NW3 aerial survey area between 2002 and 2006 and radar survey data collected between 01 October and 29 October 2005. The peak population of kittiwake recorded in the project area plus 2 km buffer during aerial surveys was 44 birds. In boat-based surveys the equivalent population was 205 birds. Kittiwake was deemed to be a species of low importance (termed sensitivity in the Walney 1 & 2 assessments).	It was considered that the wind farm area did not represent a favoured foraging habitat and the magnitude of any impact was considered to be negligible. The species was considered to be of low sensitivity. The overall significance of impacts associated with the project was considered to be very low on an EIA basis. Ireland's Eye SPA was not specifically considered in the assessments presented.

Project	Connectivity	Reason for estimates being unavailable	Qualitative assessment	Final conclusion
West of Duddon Sands (RPS, 2006b)	Breeding, post -breeding and pre-breeding season. Apportioning value in the breeding season unknown Apportioning value in the post-breeding season = 0.06% Apportioning value in the pre-breeding season = 0.08%	Disturbance impacts considered qualitatively	Site-specific surveys included boat-based surveys undertaken across an area of 512 km^2 in the vicinity of the project between May 2004 and September 2005. The project also utilised survey data collected by regional aerial surveys, undertaken across the NW3 aerial survey area between 2002 and 2006 and radar survey data collected between 01 October and 29 October 2005. The peak population of kittiwake recorded in the project area plus 2 km buffer during aerial surveys was 14 birds. In boat-based surveys the equivalent population was 454 birds. Kittiwake was deemed to be a species of low importance (termed sensitivity in the West of Duddon Sands assessments).	The magnitude of impacts was considered to be negligible. Kittiwake was considered to be of low importance (termed sensitivity in the assessments for the project). The significance of all impacts was considered to be very low on an EIA basis. Ireland's Eye SPA was not specifically considered in the assessments presented.
Gwynt y Môr (RWE Group and Npower Renewables, 2005)	Breeding, post -breeding and pre-breeding season. Apportioning value in the breeding season unknown Apportioning value in the post-breeding season = 0.06% Apportioning value in the pre-breeding season = 0.08%	Disturbance impacts considered qualitatively	Site-specific surveys undertaken in support of the project included boat-based surveys undertaken between February 2003 and March 2005. Surveys between February 2003 and February 2004 covered a large area along the Welsh coast incorporating the project area with surveys between March2004 and March 2005 more focussed on the project area. The assessment also used data from aerial surveys undertaken between 2000 and 2005 which were targeted at recording common scoter. The highest populations of kittiwake were recorded between March and May.	It was considered that displacement (termed avoidance of turbines in the assessments conducted) would result in an impact of negligible to low significance for kittiwake due to the low densities of kittiwake present at the project on an EIA basis. Ireland's Eye SPA was not specifically considered in the assessments presented.
Ormonde (Ecology Consulting, 2005)	Breeding, post -breeding and pre-breeding season. Apportioning value in the breeding season unknown Apportioning value in the post-breeding season = 0.06% Apportioning value in the pre-breeding season = 0.08%	Disturbance impacts considered qualitatively	Site-specific surveys included boat-based surveys undertaken monthly between May 2004 and April 2005. In addition, three aerial surveys were conducted during the summer of 2004 with four further aerial surveys in the winter of 2004/5. The peak population of kittiwake recorded in the wind farm plus a 2 km buffer during boat-based surveys was 60 birds. During aerial surveys the equivalent population was 2 birds. The species was recorded throughout the year during boat-based surveys with the highest numbers in April. Numbers in aerial surveys peaked in October with no records in the mid-winter period. The species was considered to be regionally important in the context of the assessments conducted.	The magnitude of the effect for kittiwake was considered to be negligible with a very low significance on an EIA basis. Ireland's Eye SPA was not specifically considered in the assessments presented.

Scenario 1: Morgan Generation Assets together with the Morgan and Morecambe Offshore Wind Farms: Transmission Assets

1.6.3.117 Kittiwake was not considered vulnerable to the impacts associated with the Morgan and Morecambe Offshore Wind Farms: Transmission Assets and although, the Ireland's Eye SPA was not specifically considered in the screening report for the project the conclusions for other SPAs are applicable to the Ireland's Eye SPA. There is therefore considered to be no change to the assessments conducted in the Integrity test: Step 1 for the Morgan Generation Assets alone and a conclusion of no adverse effect on the integrity of the kittiwake feature of the Ireland's Eye SPA is reached. Further information on specific conservation objectives is provided in Table 1.81.

Scenario 2: Morgan Generation Assets together with the Morecambe Offshore Windfarm Generation Assets and the Morgan and Morecambe Offshore Wind Farms: Transmission Assets

1.6.3.118 Wade *et al.* (2016) identifies the vulnerability of kittiwake to displacement as low and the species' habitat flexibility as moderate. Following JNCC *et al.* (2022) guidance would suggest based on the vulnerability scores in Wade *et al.* (2016) that displacement rates towards the lower end of the range presented would be applicable. Dierschke *et al.* (2016), which reviewed the response of seabird species to offshore wind farms identified kittiwake as a species that exhibited weak avoidance to offshore wind farms. This also suggests that lower displacement rates are applicable to this species.

1.6.3.119 Using a displacement rate of 50% and mortality rate of 1%, which is considered to be precautionary, provides a displacement mortality total of 0.31 birds/annum. When combined with the collision risk totals estimated in Table 1.61 this provides a combined impact of 0.4 to 0.5 birds/annum. This represents an increase in the baseline mortality of the SPA population of 0.28% to 0.36%.

1.6.3.120 Based on the approach taken in the integrity test: Step 1 this is not considered to represent an adverse effect on the site integrity of the kittiwake feature of the Ireland's Eye SPA.

Scenario 3: Tier 1, Tier 2 and Tier 3: Morgan Generation Assets together with the Morgan and Morecambe Offshore Wind Farms: Transmission Assets and other relevant projects and plans.

1.6.3.121 Wade *et al.* (2016) identifies the vulnerability of kittiwake to displacement as low and the species' habitat flexibility as moderate. Following JNCC *et al.* (2022) guidance would suggest based on the vulnerability scores in Wade *et al.* (2016) that displacement rates towards the lower end of the range presented would be applicable. Dierschke *et al.* (2016), which reviewed the response of seabird species to offshore wind farms identified kittiwake as a species that exhibited weak avoidance to offshore wind farms. This also suggests that lower displacement rates are applicable to this species.

1.6.3.122 Paragraphs 1.5.3.17 to 1.5.3.20 provide a review of evidence for deriving displacement and mortality rates for kittiwake. Using a displacement rate of 50% and mortality rate of 1%, which is considered to be precautionary, provides a displacement mortality total of 0.58 birds/annum. When combined with the collision risk totals estimated in Table 1.61 this provides a combined impact of 1.1 to 2.3 birds/annum. This represents an increase in the baseline mortality of the SPA population of 0.79% to 1.69%.

1.6.3.123 However, the collision risk estimates calculated under both scenarios are considered to be considerable over-estimates for the following reasons:

- Over-estimation of impacts associated with the projects with connectivity in the breeding season due to immature birds not being accounted for within the apportioning process undertaken for that project
- Over-estimation of impacts associated with the projects with connectivity in the breeding season due not being accounted for within the apportioning process undertaken for that project
- It is considered that an avoidance rate of 99.79% is appropriate for kittiwake based on the information presented n Ozsanlav-Harris et al. (2023) (see Volume 4, Annex 5.3: Offshore Ornithology Collision Risk Modelling Technical Report)
- It is considered that the flight speed information provided by Skov et al. (2018) provides a far more robust appraisal of kittiwake flight behaviour than any other source of flight height data (see Volume 4, Annex 5.3: Offshore Ornithology Collision Risk Modelling Technical Report)
- Use of collision risk estimates that represent the assessed turbine scenario at projects that make a significant contribution The total potential in-combination impact, with the use of as-built scenarios leading to significant reductions in collision risk estimates.

1.6.3.124 When taking into account the elements of the assessment discussed above it is considered that the collision total associated with the Morgan Generation Assets in-combination with other projects will not surpass the 1% baseline mortality threshold of the kittiwake population at the Ireland's Eye SPA. Following the methodology applied in the integrity test: Step 1 it is therefore considered that there is no AEOI of the Ireland's Eye SPA as a result of in-combination collision impacts on kittiwake. An assessment against the conservation objectives for the kittiwake population of the Ireland's Eye SPA is provided in Table 1.81.

1.6.3.125 The conclusions reached for the kittiwake population at the Ireland's Eye SPA are also considered applicable to the North-west Irish Sea SPA. An assessment against the conservation objectives for the kittiwake feature of the North-west Irish Sea SPA is provided in Table 1.82.

Table 1.81: Conclusions against the conservation objectives of the kittiwake qualifying feature of the Ireland's Eye SPA for in-combination collision risk impacts.

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Tier 1, Tier 2, Tier 3 projects
Population size: Long term SPA population trend is stable or increasing	• Collision risk impacts are not applicable to the Morgan and Morecambe Offshore Wind Farms: Transmission Assets. Kittiwake are not considered vulnerable to the impacts associated with the Morgan and Morecambe Offshore Wind Farms: Transmission Assets. Therefore the assessment undertaken for the Morgan Generation Assets alone in section 1.5 remains unchanged.	• Potential impacts from the Morgan Generation Assets, and Morecambe Generation Assets on the kittiwake feature of the Ireland's Eye SPA will occur throughout the annual cycle. The predicted in-combination impact is considered to represent less than a 1% increase in the baseline mortality of the SPA population. • Kittiwake is sensitive to collision risk and displacement impacts (Wade *et al.,* 2016) however, the magnitude of predicted impacts apportioned to the SPA will not exceed the 1% threshold of baseline mortality. Therefore, collision risk during the operations and maintenance phase will not prevent the population of kittiwake from being maintained or restored.	• Potential impacts from the Morgan Generation Assets, and all other projects considered in-combination on the kittiwake feature of the Ireland's Eye SPA will occur throughout the annual cycle. The predicted in-combination impact is considered to represent less than a 1% increase in the baseline mortality of the SPA population. • Kittiwake is sensitive to collision risk and displacement impacts (Wade et al., 2016) however, the magnitude of predicted impacts apportioned to the SPA will not exceed the 1% threshold of baseline mortality. Therefore, collision risk during the operations and maintenance phase will not prevent the population of kittiwake from being maintained or restored.
Spatial distribution: Sufficient number of locations, area, and availability (in terms of timing and intensity of use) of suitable habitat to support the population	• Kittiwake are not considered vulnerable to the impacts associated with the Morgan and Morecambe Offshore Wind Farms: Transmission Assets. Therefore the assessment undertaken for the Morgan Generation Assets alone in section 1.5 remains unchanged.	• There is no potential for collision risk impact pathway to affect this conservation objective. • The Morgan Generation Assets occupy an area of 280 km^2. In the breeding season the mean-maximum foraging range plus one standard deviation of kittiwake is 300.6 km. Applying this foraging range from the SPA would mean kittiwakes from the SPA could exploit the entire Irish Sea, areas in Scottish waters and a considerable area within the Celtic Sea. In the non-breeding season is, based on information in Furness (2015), considered	• There is no potential for collision risk impact pathway to affect this conservation objective. • The Morgan Generation Assets occupy an area of 280 km^2. In the breeding season the mean-maximum foraging range plus one standard deviation of kittiwake is 300.6 km. Applying this foraging range from the SPA would mean kittiwakes from the SPA could exploit the entire Irish Sea, areas in Scottish waters and a considerable area within the Celtic Sea. In the non-breeding season is, based on information in Furness (2015), considered to extend from the north coast of Scotland to the south coast of Kent,
Forage spatial distribution, extent, abundance and availability: Sufficient number of locations, area of suitable habitat and	• Kittiwake are not considered vulnerable to the impacts associated with the Morgan and Morecambe Offshore Wind Farms: Transmission Assets. Therefore the assessment undertaken for the Morgan		

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Tier 1, Tier 2, Tier 3 projects
available forage biomass to support the population target	Generation Assets alone in section 1.5 remains unchanged.	to extend from the north coast of Scotland to the south coast of Kent, England. The Morgan Generation Assets therefore represent a negligible proportion of the habitat available to kittiwake from the Ireland's Eye SPA in all seasons. • The Morecambe Generation Assets occupy an area of 126 km^2. The Morecambe Generation Assets therefore represent a negligible proportion of the habitat available to kittiwake from the Ireland's Eye SPA in all seasons. • Kittiwake is sensitive to displacement impacts (Wade *et al.,* 2016) however, there is no effect of airborne sound, underwater sound, and presence of vessels on the supporting habitats (and food availability). Therefore, disturbance and displacement from airborne sound and presence of vessels and infrastructure during the construction and decommissioning phases will not prevent the extent and distribution, structure and function or the supporting processes of the habitats of the qualifying features from being maintained or restored.	England. The Morgan Generation Assets therefore represent a negligible proportion of the habitat available to kittiwake from the Ireland's Eye SPA in all seasons. • A further 16 projects may act in-combination with the Morgan Generation Assets to impact the kittiwake feature of the Ireland's Eye SPA. Impacts from some of these projects on this feature will only occur in the non-breeding season. It is considered that the total area represented by these projects represents only a small proportion of the habitat available to kittiwake from the Ireland's Eye SPA in all seasons. • Kittiwake is sensitive to displacement impacts (Wade *et al.,* 2016) however, there is no effect of airborne sound, underwater sound, and presence of vessels on the supporting habitats (and food availability). Therefore, disturbance and displacement from airborne sound and presence of vessels and infrastructure during the construction and decommissioning phases will not prevent the extent and distribution, structure and function or the supporting processes of the habitats of the qualifying features from being maintained or restored.
Disturbance across the site: The intensity, frequency, timing and duration of disturbance occurs at levels that do not significantly impact the achievement of	• There is no impact pathway for this conservation objective.	• There is no impact pathway for this conservation objective.	• There is no impact pathway for this conservation objective.

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Tier 1, Tier 2, Tier 3 projects
targets for population size and spatial distribution			
Barriers to connectivity: The number, location, shape and area of barriers do not significantly impact the site population's access to the SPA or other ecologically important site outside the SPA	• Kittiwake are not considered vulnerable to the impacts associated with the Morgan and Morecambe Offshore Wind Farms: Transmission Assets. Therefore the assessment undertaken for the Morgan Generation Assets alone in section 1.5 remains unchanged.	• The area in which the Morgan Generation Assets are located is not considered to represent an important area for kittiwake (see Volume 4, Annex 5.1: Offshore ornithology baseline characterisation report of the Environmental Statement) with no known areas of importance beyond the Morgan Generation Assets that kittiwake from the Ireland's Eye SPA may utilise. The Morgan Generation Assets are also on the edge of the generic mean-maximum foraging range of kittiwake (Woodward *et al.,* 2019) with birds highly unlikely to routinely forage at this distance. The Morgan Generation Assets are therefore considered to not represent a barrier to kittiwake from the Irelands Eye SPA to ecologically important sites outside of the SPA. This conclusion is also considered applicable to the Morecambe Generation Assets.	• The area in which the Morgan Generation Assets are located is not considered to represent an important area for kittiwake (see Volume 4, Annex 5.1: Offshore ornithology baseline characterisation report of the Environmental Statement) with no known areas of importance beyond the Morgan Generation Assets that kittiwake from the Ireland's Eye SPA may utilise. The Morgan Generation Assets are also on the edge of the generic mean-maximum foraging range of kittiwake (Woodward *et al.,* 2019) with birds highly unlikely to routinely forage at this distance. The Morgan Generation Assets are therefore considered to not represent a barrier to kittiwake from the Irelands Eye SPA to ecologically important sites outside of the SPA. • Projects considered in-combination are either beyond or located on the edge of the generic mean-maximum foraging range of kittiwake (Woodward *et al.,* 2019). Many are located close to the coast and therefore there is limited areas beyond these projects that could be utilised by kittiwake from the SPA. It is therefore considered that no project considered in-combination will represent a barrier to kittiwake from the Irelands Eye SPA to ecologically important sites outside of the SPA.

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Tier 1, Tier 2, Tier 3 projects
Conclusion	**Adverse effects on the kittiwake qualifying feature, which undermine the conservation objectives of the Ireland's Eye SPA, will not occur as a result of collision risk in-combination with the Morgan and Morecambe Offshore Wind Farms: Transmission Assets**	**Adverse effects on the kittiwake qualifying feature, which undermine the conservation objectives of the Ireland's Eye SPA, will not occur as a result of collision risk in-combination with the Morgan and Morecambe Offshore Wind Farms: Transmission Assets and Morecambe Offshore Windfarm Generation Assets.**	**Adverse effects on the kittiwake qualifying feature, which undermine the conservation objectives of the Ireland's Eye SPA, will not occur as a result of collision risk in-combination with the Morgan and Morecambe Offshore Wind Farms: Transmission Assets, Morecambe Offshore Windfarm Generation Assets, as well as Tier 1, Tier 2 and Tier 3 projects.**

Table 1.82: Conclusions against the conservation objectives of the kittiwake qualifying feature of the North-west Irish Sea SPA for in-combination collision risk impacts.

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Tier 1, Tier 2, Tier 3 projects
Population size: Long term SPA population trend is stable or increasing	• Collision risk impacts are not applicable to the Morgan and Morecambe Offshore Wind Farms: Transmission Assets. Kittiwake are not considered vulnerable to the impacts associated with the Morgan and Morecambe Offshore Wind Farms: Transmission Assets. Therefore the assessment undertaken for the Morgan Generation Assets alone in section 1.5 remains unchanged.	• Potential impacts from the Morgan Generation Assets, and Morecambe Generation Assets on the kittiwake feature of the North-west Irish Sea SPA will occur throughout the annual cycle. The predicted in-combination impact is considered to represent less than a 1% increase in the baseline mortality of the SPA population. • Kittiwake is sensitive to collision risk and displacement impacts (Wade *et al.,* 2016) however, the magnitude of predicted impacts apportioned to the SPA will not exceed the 1% threshold of baseline mortality. Therefore, collision risk during the operations and maintenance phase will not prevent the population of kittiwake from being maintained or restored.	• Potential impacts from the Morgan Generation Assets, and all other projects considered in-combination on the kittiwake feature of the North-west Irish Sea SPA will occur throughout the annual cycle. The predicted in-combination impact is considered to represent less than a 1% increase in the baseline mortality of the SPA population. • Kittiwake is sensitive to collision risk and displacement impacts (Wade et al., 2016) however, the magnitude of predicted impacts apportioned to the SPA will not exceed the 1% threshold of baseline mortality. Therefore, collision risk during the operations and maintenance phase will not prevent the population of kittiwake from being maintained or restored.
Spatial distribution: Sufficient number of locations, area, and availability (in terms of timing and intensity of use) of suitable habitat to support the population	Kittiwake are not considered vulnerable to the impacts associated with the Morgan and Morecambe Offshore Wind Farms: Transmission Assets. Therefore the assessment undertaken for the Morgan Generation Assets alone in section 1.5 remains unchanged.	• There is no potential for collision risk impact pathway to affect this conservation objective. • The Morgan Generation Assets occupy an area of 280 km^2. In the breeding season the mean-maximum foraging range plus one standard deviation of kittiwake is 300.6 km. Applying this foraging range from the SPA would mean kittiwakes from the SPA could exploit the entire Irish Sea, areas in Scottish waters and a considerable area within the Celtic Sea. In the non-breeding season is, based on	• There is no potential for collision risk impact pathway to affect this conservation objective. • The Morgan Generation Assets occupy an area of 280 km2. In the breeding season the mean-maximum foraging range plus one standard deviation of kittiwake is 300.6 km. Applying this foraging range from the SPA would mean kittiwakes from the SPA could exploit the entire Irish Sea, areas in Scottish waters and a considerable area within the Celtic Sea. In the non-breeding season is, based on information in Furness (2015), considered to extend from the north coast of
Forage spatial distribution, extent, abundance and availability: Sufficient number of locations, area of suitable habitat and	Kittiwake are not considered vulnerable to the impacts associated with the Morgan and Morecambe Offshore Wind Farms: Transmission Assets. Therefore the assessment undertaken for the Morgan		

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Tier 1, Tier 2, Tier 3 projects
available forage biomass to support the population target	Generation Assets alone in section 1.5 remains unchanged.	information in Furness (2015), considered to extend from the north coast of Scotland to the south coast of Kent, England. The Morgan Generation Assets therefore represent a negligible proportion of the habitat available to kittiwake from the North-west Irish Sea SPA in all seasons. • The Morecambe Generation Assets occupy an area of 126 km2. The Morecambe Generation Assets therefore represent a negligible proportion of the habitat available to kittiwake from the North-west Irish Sea SPA in all seasons. • Kittiwake is sensitive to displacement impacts (Wade et al., 2016) however, there is no effect of airborne sound, underwater sound, and presence of vessels on the supporting habitats (and food availability). Therefore, disturbance and displacement from airborne sound and presence of vessels and infrastructure during the construction and decommissioning phases will not prevent the extent and distribution, structure and function or the supporting processes of the habitats of the qualifying features from being maintained or restored.	Scotland to the south coast of Kent, England. The Morgan Generation Assets therefore represent a negligible proportion of the habitat available to kittiwake from the North-west Irish Sea SPA in all seasons. • A further 16 projects may act in-combination with the Morgan Generation Assets to impact the kittiwake feature of the North-west Irish Sea SPA. Impacts from some of these projects on this feature will only occur in the non-breeding season. It is considered that the total area represented by these projects represents only a small proportion of the habitat available to kittiwake from the North-west Irish Sea SPA in all seasons. • Kittiwake is sensitive to displacement impacts (Wade et al., 2016) however, there is no effect of airborne sound, underwater sound, and presence of vessels on the supporting habitats (and food availability). Therefore, disturbance and displacement from airborne sound and presence of vessels and infrastructure during the construction and decommissioning phases will not prevent the extent and distribution, structure and function or the supporting processes of the habitats of the qualifying features from being maintained or restored.
Disturbance across the site: The intensity, frequency, timing and duration of disturbance occurs at levels that do not significantly impact the achievement of	• There is no impact pathway for this conservation objective.	• There is no impact pathway for this conservation objective.	• There is no impact pathway for this conservation objective.

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Tier 1, Tier 2, Tier 3 projects
targets for population size and spatial distribution			
Barriers to connectivity: The number, location, shape and area of barriers do not significantly impact the site population's access to the SPA or other ecologically important site outside the SPA	Kittiwake are not considered vulnerable to the impacts associated with the Morgan and Morecambe Offshore Wind Farms: Transmission Assets. Therefore the assessment undertaken for the Morgan Generation Assets alone in section 1.5 remains unchanged.	• The area in which the Morgan Generation Assets are located is not considered to represent an important area for kittiwake (see Volume 4, Annex 5.1: Offshore ornithology baseline characterisation report of the Environmental Statement) with no known areas of importance beyond the Morgan Generation Assets that kittiwake from the North-west Irish Sea SPA may utilise. The Morgan Generation Assets are also on the edge of the generic mean-maximum foraging range of kittiwake (Woodward *et al.,* 2019) with birds highly unlikely to routinely forage at this distance. The Morgan Generation Assets are therefore considered to not represent a barrier to kittiwake from the Irelands Eye SPA to ecologically important sites outside of the SPA. This conclusion is also considered applicable to the Morecambe Generation Assets.	• The area in which the Morgan Generation Assets are located is not considered to represent an important area for kittiwake (see Volume 4, Annex 5.1: Offshore ornithology baseline characterisation report of the Environmental Statement) with no known areas of importance beyond the Morgan Generation Assets that kittiwake from the North-west Irish Sea SPA may utilise. The Morgan Generation Assets are also on the edge of the generic mean-maximum foraging range of kittiwake (Woodward et al., 2019) with birds highly unlikely to routinely forage at this distance. The Morgan Generation Assets are therefore considered to not represent a barrier to kittiwake from the Irelands Eye SPA to ecologically important sites outside of the SPA. • Projects considered in-combination are either beyond or located on the edge of the generic mean-maximum foraging range of kittiwake (Woodward et al., 2019). Many are located close to the coast and therefore there is limited areas beyond these projects that could be utilised by kittiwake from the SPA. It is therefore considered that no project considered in-combination will represent a barrier to kittiwake from the Irelands Eye SPA to ecologically important sites outside of the SPA.

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Tier 1, Tier 2, Tier 3 projects
Conclusion	**Adverse effects on the kittiwake qualifying feature, which undermine the conservation objectives of the North-west Irish Sea SPA, will not occur as a result of collision risk in-combination with the Morgan and Morecambe Offshore Wind Farms: Transmission Assets**	**Adverse effects on the kittiwake qualifying feature, which undermine the conservation objectives of the North-west Irish Sea SPA, will not occur as a result of collision risk in-combination with the Morgan and Morecambe Offshore Wind Farms: Transmission Assets and Morecambe Offshore Windfarm Generation Assets.**	**Adverse effects on the kittiwake qualifying feature, which undermine the conservation objectives of the North-west Irish Sea SPA, will not occur as a result of collision risk in-combination with the Morgan and Morecambe Offshore Wind Farms: Transmission Assets, Morecambe Offshore Windfarm Generation Assets, as well as Tier 1, Tier 2 and Tier 3 projects.**

Cape Wrath SPA

Kittiwake

1.6.3.126 Based on the mean-maximum foraging range +1SD of kittiwake (Woodward *et al*., 2019) from the Cape Wrath SPA, there are numerous projects within foraging range of kittiwake from the SPA during the breeding season. In the non-breeding season, there are additional projects within the BDMPS of relevance to the species (Furness, 2015).

1.6.3.127 Table 1.83 presents the seasonal abundance values for use in displacement analyses for those projects for which quantified estimates can be obtained.

1.6.3.128 For displacement, population estimates represent the number of kittiwake from the Cape Wrath SPA. There are a number of projects for which there are no, or limited, data on the number of kittiwake predicted to be displaced. For some of these projects qualitative assessments were conducted and these are summarised in Table 1.84.

1.6.3.129 Apportioning values for the breeding season have been taken from project-specific documentation, where available. If unavailable an apportioning value from the nearest project for which an apportioning value is available has been applied. In the non-breeding season, apportioning values calculated using information from Furness (2015) has been applied to collision risk estimates from all projects.

Table 1.83: Cumulative abundance for kittiwake at the Cape Wrath SPA for projects considered in-combination in relation to disturbance and displacement from projects.

a – apportioning value unavailable, assumed to be the same as the Morgan Generation Assets

b – apportioning value unavailable, assumed to be the same as Erebus offshore wind farm

Project	Seasonal apportioning values			Seasonal abundance values		
	Breeding	Post-breeding	Pre-breeding	Breeding	Post-breeding	Pre-breeding
Awel y Môr	No connectivity	0.014	0.024	-	2.5	10.1
Burbo Bank Extension	No connectivity	0.014	0.024	-	3.8	3.3
Erebus	No connectivity	0.014	0.024	-	27.5	12.2
Mona Offshore Wind Project	No connectivity	0.014	0.024	-	7.6	21.2
Morecambe Offshore Wind Farm: Generation Assets	No connectivity	0.014	0.024	-	35.0	13.6
Morgan Generation Assets	No connectivity	0.014	0.024	-	15.7	18.9
Rampion	No connectivity	0.014	0.024	-	5.8	9.0
Rampion 2	No connectivity	0.014	0.024	-	1.3	6.8
Walney 3 + 4	No connectivity	0.014	0.024	-	8.8	8.0
West of Orkney	0.229	0.014	0.024	157.7	Unavailable	29.1

Project	Seasonal apportioning values			Seasonal abundance values		
	Breeding	Post-breeding	Pre-breeding	Breeding	Post-breeding	Pre-breeding
White Cross	No connectivity	0.014	0.024	-	1.1	10.3
Annual totals						
Scenario 2				**83.2**		
Scenario 3				**410.9**		

Table 1.84: Qualitative assessment of projects considered cumulatively with the Morgan Generation Assets for which quantitative consideration of displacement impacts was not undertaken in project-specific documentation for kittiwake.

Project	Connectivity	Reason for estimates being unavailable	Qualitative assessment	Final conclusion
Tier 1				
Burbo Bank (Seascape Energy Ltd., 2002)	Breeding, post - breeding and pre-breeding season. Apportioning value in the breeding season unknown Apportioning value in the post-breeding season = 0.01% Apportioning value in the pre-breeding season = 0.02%	Disturbance impacts considered qualitatively	Surveys of the project comprised aerial and boat-based surveys both of which were undertaken during winter months (aerial = November to April and boat-based = December and February). Aerial surveys covered a large area encompassing the Liverpool Bay SPA with boat-based surveys covering the project area. The surveys were undertaken to provide abundance and distribution data for those species considered to be of most importance, namely common scoter and red-throated diver. Low numbers of kittiwake were recorded during boat-based surveys with relatively low numbers also recorded during aerial surveys.	Kittiwake was not considered to be a species of International or National importance in the context of the assessments undertaken. Although kittiwake was not specifically assessed due to the species being considered of limited importance, low levels of disturbance were predicted for other species with conclusions of a negligible magnitude and very low significance reached on an EIA basis. Cape Wrath SPA was not specifically considered in the assessments presented.
Walney 1 & 2 (RPS, 2006a)	Breeding, post - breeding and pre-breeding season. Apportioning value in the breeding season unknown Apportioning value in the post-breeding season = 0.01% Apportioning value in the pre-breeding season = 0.02%	Disturbance impacts considered qualitatively	Site-specific surveys included boat-based surveys undertaken across an area of 512 km^2 in the vicinity of the project between May 2004 and September 2005. The project also utilised survey data collected by regional aerial surveys, undertaken across the NW3 aerial survey area between 2002 and 2006 and radar survey data collected between 01 October and 29 October 2005. The peak population of kittiwake recorded in the project area plus 2 km buffer during aerial surveys was 44 birds. In boat-based surveys the equivalent population was 205 birds. Kittiwake was deemed to be a species of low importance (termed sensitivity in the Walney 1 & 2 assessments).	It was considered that the wind farm area did not represent a favoured foraging habitat and the magnitude of any impact was considered to be negligible. The species was considered to be of low sensitivity. The overall significance of impacts associated with the project was considered to be very low on an EIA basis. Cape Wrath SPA was not specifically considered in the assessments presented.

Project	Connectivity	Reason for estimates being unavailable	Qualitative assessment	Final conclusion
West of Duddon Sands (RPS, 2006b)	Breeding, post - breeding and pre-breeding season. Apportioning value in the breeding season unknown Apportioning value in the post-breeding season = 0.01% Apportioning value in the pre-breeding season = 0.02%	Disturbance impacts considered qualitatively	Site-specific surveys included boat-based surveys undertaken across an area of 512 km^2 in the vicinity of the project between May 2004 and September 2005. The project also utilised survey data collected by regional aerial surveys, undertaken across the NW3 aerial survey area between 2002 and 2006 and radar survey data collected between 01 October and 29 October 2005. The peak population of kittiwake recorded in the project area plus 2 km buffer during aerial surveys was 14 birds. In boat-based surveys the equivalent population was 454 birds. Kittiwake was deemed to be a species of low importance (termed sensitivity in the West of Duddon Sands assessments).	The magnitude of impacts was considered to be negligible. Kittiwake was considered to be of low importance (termed sensitivity in the assessments for the project). The significance of all impacts was considered to be very low on an EIA basis. Cape Wrath SPA was not specifically considered in the assessments presented.
Gwynt y Môr (RWE Group and Npower Renewables, 2005)	Breeding, post - breeding and pre-breeding season. Apportioning value in the breeding season unknown Apportioning value in the post-breeding season = 0.01% Apportioning value in the pre-breeding season = 0.02%	Disturbance impacts considered qualitatively	Site-specific surveys undertaken in support of the project included boat-based surveys undertaken between February 2003 and March 2005. Surveys between February 2003 and February 2004 covered a large area along the Welsh coast incorporating the project area with surveys between March2004 and March 2005 more focussed on the project area. The assessment also used data from aerial surveys undertaken between 2000 and 2005 which were targeted at recording common scoter. The highest populations of kittiwake were recorded between March and May.	It was considered that displacement (termed avoidance of turbines in the assessments conducted) would result in an impact of negligible to low significance for kittiwake due to the low densities of kittiwake present at the project on an EIA basis. Cape Wrath SPA was not specifically considered in the assessments presented.

Project	Connectivity	Reason for estimates being unavailable	Qualitative assessment	Final conclusion
Ormonde (Ecology Consulting, 2005)	Breeding, post - breeding and pre-breeding season. Apportioning value in the breeding season unknown Apportioning value in the post-breeding season = 0.01% Apportioning value in the pre-breeding season = 0.02%	Disturbance impacts considered qualitatively	Site-specific surveys included boat-based surveys undertaken monthly between May 2004 and April 2005. In addition, three aerial surveys were conducted during the summer of 2004 with four further aerial surveys in the winter of 2004/5. The peak population of kittiwake recorded in the wind farm plus a 2 km buffer during boat-based surveys was 60 birds. During aerial surveys the equivalent population was 2 birds. The species was recorded throughout the year during boat-based surveys with the highest numbers in April. Numbers in aerial surveys peaked in October with no records in the mid-winter period. The species was considered to be regionally important in the context of the assessments conducted.	The magnitude of the effect for kittiwake was considered to be negligible with a very low significance on an EIA basis. Cape Wrath SPA was not specifically considered in the assessments presented.
Robin Rigg (Natural Power, 2002)	Non-breeding seasons only. Apportioning value in the post-breeding season = 0.01% Apportioning value in the pre-breeding season = 0.02%	Disturbance impacts considered qualitatively.	The project utilised site-specific boat-based surveys to characterise the baseline environment. Two surveys were completed in each month from May 2001 for one year. In addition, aerial surveys were undertaken from November 2001 on a monthly basis through winter and spring to verify the distribution and abundance of seaduck. The mean count of kittiwake during boat-based surveys in the wind farm was 4.5 birds with a peak of 46 birds. Kittiwake was considered to be of local importance based on the populations recorded in the wind farm.	The magnitude of the effect was considered to be low with a low significance.

Scenario 1: Morgan Generation Assets together with the Morgan and Morecambe Offshore Wind Farms: Transmission Assets

1.6.3.130 Kittiwake was not considered vulnerable to the impacts associated with the Morgan and Morecambe Offshore Wind Farms: Transmission Assets and although, the Cape Wrath SPA was not specifically considered in the screening report for the project the conclusions for other SPAs are applicable to the Cape Wrath SPA. There is therefore considered to be no change to the assessments conducted in the Integrity test: Step 1 for the Morgan Generation Assets alone and a conclusion of no adverse effect on the integrity of the kittiwake feature of the Cape Wrath SPA is reached. Further information on specific conservation objectives is provided in Table 1.85.

Scenario 2: Morgan Generation Assets together with the Morecambe Offshore Windfarm Generation Assets and the Morgan and Morecambe Offshore Wind Farms: Transmission Assets

1.6.3.131 Wade *et al.* (2016) identifies the vulnerability of kittiwake to displacement as low and the species' habitat flexibility as moderate. Following JNCC *et al.* (2022) guidance would suggest based on the vulnerability scores in Wade *et al.* (2016) that displacement rates towards the lower end of the range presented would be applicable. Dierschke *et al.* (2016), which reviewed the response of seabird species to offshore wind farms identified kittiwake as a species that exhibited weak avoidance to offshore wind farms. This also suggests that lower displacement rates are applicable to this species.

1.6.3.132 Using a displacement rate of 50% and mortality rate of 1%, which is considered to be precautionary, provides a displacement mortality total of 0.4 birds/annum. When combined with the collision risk totals estimated in Table 1.66 this provides a combined impact of 0.5 to 1.3 birds/annum. This represents an increase in the baseline mortality of the SPA population of 0 0.05% to 0.12%.

1.6.3.133 Based on the approach taken in the integrity test: Step 1 this is not considered to represent an adverse effect on the site integrity of the kittiwake feature of the Cape Wrath SPA.

Scenario 3: Tier 1, Tier 2 and Tier 3: Morgan Generation Assets together with the Morgan and Morecambe Offshore Wind Farms: Transmission Assets and other relevant projects and plans.

1.6.3.134 Wade *et al.* (2016) identifies the vulnerability of kittiwake to displacement as low and the species' habitat flexibility as moderate. Following JNCC *et al.* (2022) guidance would suggest based on the vulnerability scores in Wade *et al.* (2016) that displacement rates towards the lower end of the range presented would be applicable. Dierschke *et al.* (2016), which reviewed the response of seabird species to offshore wind farms identified kittiwake as a species that exhibited weak avoidance to offshore wind farms. This also suggests that lower displacement rates are applicable to this species.

1.6.3.135 Paragraphs 1.5.3.17 to 1.5.3.20 provide a review of evidence for deriving displacement and mortality rates for kittiwake. Using a displacement rate of 50% and mortality rate of 1%, which is considered to be precautionary, provides a displacement mortality total of 2.1 birds/annum. When combined with the collision risk totals estimated in Table 1.66 this provides a combined impact of 5.1 to 12.9 birds/annum. This represents an increase in the baseline mortality of the SPA population of 0.48% to 1.22%.

1.6.3.136 However, the collision risk estimates calculated under both scenarios are considered to be considerable over-estimates for the following reasons:

- Over-estimation of impacts associated with the West of Orkney wind farm due to immature birds not being accounted for within the apportioning process undertaken for that project
- Over-estimation of impacts associated with the West of Orkney wind farm due to sabbatical birds not being accounted for within the apportioning process undertaken for that project
- It is considered that an avoidance rate of 99.79% is appropriate for kittiwake based on the information presented n Ozsanlav-Harris *et al.* (2023) (see Volume 4, Annex 5.3: Offshore Ornithology Collision Risk Modelling Technical Report)
- It is considered that the flight speed information provided by Skov *et al.* (2018) provides a far more robust appraisal of kittiwake flight behaviour than any other source of flight height data (see Volume 4, Annex 5.3: Offshore Ornithology Collision Risk Modelling Technical Report)
- Use of collision risk estimates that represent the assessed turbine scenario at projects that make a significant contribution The total potential in-combination impact, with the use of as-built scenarios leading to significant reductions in collision risk estimates.

1.6.3.137 When taking into account the elements of the assessment discussed above it is considered that the collision total associated with the Morgan Generation Assets in-combination with other projects will not surpass the 1% baseline mortality threshold of the kittiwake population at the Cape Wrath SPA. Following the methodology applied in the integrity test: Step 1 it is therefore considered that there is no AEOI of the Cape Wrath SPA as a result of in-combination collision impacts on kittiwake. An assessment against the conservation objectives for the kittiwake population of the Cape Wrath SPA is provided in Table 1.85.

Table 1.85: Conclusions against the conservation objectives of the kittiwake qualifying feature of the Cape Wrath SPA for in-combination collision risk impacts.

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Tier 1, Tier 2, Tier 3 projects
Population size: Long term SPA population trend is stable or increasing	• Collision risk impacts are not applicable to the Morgan and Morecambe Offshore Wind Farms: Transmission Assets. Kittiwake are not considered vulnerable to the impacts associated with the Morgan and Morecambe Offshore Wind Farms: Transmission Assets. Therefore the assessment undertaken for the Morgan Generation Assets alone in section 1.5 remains unchanged.	• Potential impacts from the Morgan Generation Assets, and Morecambe Generation Assets on the kittiwake feature of the Cape Wrath SPA will occur in the non-breeding season only. The predicted in-combination impact is considered to represent less than a 1% increase in the baseline mortality of the SPA population. • Kittiwake is sensitive to collision risk and displacement impacts (Wade et al., 2016) however, the magnitude of predicted impacts apportioned to the SPA will not exceed the 1% threshold of baseline mortality. Therefore, collision risk during the operations and maintenance phase will not prevent the population of kittiwake from being maintained or restored.	• Potential impacts from the Morgan Generation Assets, and all other projects considered in-combination on the kittiwake feature of the Cape Wrath SPA will occur throughout the annual cycle. The predicted in-combination impact is considered to represent less than a 1% increase in the baseline mortality of the SPA population. • Kittiwake is sensitive to collision risk and displacement impacts (Wade et al., 2016) however, the magnitude of predicted impacts apportioned to the SPA will not exceed the 1% threshold of baseline mortality. Therefore, collision risk during the operations and maintenance phase will not prevent the population of kittiwake from being maintained or restored.
Spatial distribution: Sufficient number of locations, area, and availability (in terms of timing and intensity of use) of suitable habitat to support the population	• Kittiwake are not considered vulnerable to the impacts associated with the Morgan and Morecambe Offshore Wind Farms: Transmission Assets. Therefore the assessment undertaken for the Morgan Generation Assets alone in section 1.5 remains unchanged.	• There is no potential for collision risk impact pathway to affect this conservation objective. • The Morgan Generation Assets occupy an area of 280 km^2. In the non-breeding season is, based on information in Furness (2015), considered to extend from the north coast of Scotland to the south coast of Kent, England. The Morgan Generation Assets therefore represent a negligible proportion of the habitat available to kittiwake from the Cape Wrath SPA in all seasons.	• There is no potential for collision risk impact pathway to affect this conservation objective. • The Morgan Generation Assets occupy an area of 280 km^2. In the non-breeding season is, based on information in Furness (2015), considered to extend from the north coast of Scotland to the south coast of Kent, England. The Morgan Generation Assets therefore represent a negligible proportion of the habitat available to kittiwake from the Cape Wrath SPA in all seasons. • A further 16 projects may act in-combination with the Morgan Generation Assets to impact the kittiwake feature of the Cape
Forage spatial distribution, extent, abundance and availability: Sufficient number of locations, area of suitable habitat and	• Kittiwake are not considered vulnerable to the impacts associated with the Morgan and Morecambe Offshore Wind Farms: Transmission Assets. Therefore the assessment undertaken for the Morgan		

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Tier 1, Tier 2, Tier 3 projects
available forage biomass to support the population target	Generation Assets alone in section 1.5 remains unchanged.	• The Morecambe Generation Assets occupy an area of 126 km^2. The Morecambe Generation Assets therefore represent a negligible proportion of the habitat available to kittiwake from the Cape Wrath SPA in all seasons. • Kittiwake is sensitive to displacement impacts (Wade *et al.,* 2016) however, there is no effect of airborne sound, underwater sound, and presence of vessels on the supporting habitats (and food availability). Therefore, disturbance and displacement from airborne sound and presence of vessels and infrastructure during the construction and decommissioning phases will not prevent the extent and distribution, structure and function or the supporting processes of the habitats of the qualifying features from being maintained or restored.	Wrath SPA. Impacts on this feature from the majority of these projects will only occur in the non-breeding season. It is considered that the total area represented by these projects represents only a small proportion of the habitat available to kittiwake from the Cape Wrath SPA in all seasons. • Kittiwake is sensitive to displacement impacts (Wade *et al.,* 2016) however, there is no effect of airborne sound, underwater sound, and presence of vessels on the supporting habitats (and food availability). Therefore, disturbance and displacement from airborne sound and presence of vessels and infrastructure during the construction and decommissioning phases will not prevent the extent and distribution, structure and function or the supporting processes of the habitats of the qualifying features from being maintained or restored.
Disturbance across the site: The intensity, frequency, timing and duration of disturbance occurs at levels that do not significantly impact the achievement of targets for population size and spatial distribution	• There is no impact pathway for this conservation objective.	• There is no impact pathway for this conservation objective.	• There is no impact pathway for this conservation objective.
Barriers to connectivity: The number, location, shape and area of barriers do not significantly impact the site population's access to the SPA or other ecologically	• Kittiwake are not considered vulnerable to the impacts associated with the Morgan and Morecambe Offshore Wind Farms: Transmission Assets. Therefore the assessment undertaken for the Morgan	• The area in which the Morgan Generation Assets are located is not considered to represent an important area for kittiwake (see Volume 4, Annex 5.1: Offshore ornithology baseline characterisation report of the Environmental Statement)	• The area in which the Morgan Generation Assets are located is not considered to represent an important area for kittiwake (see Volume 4, Annex 5.1: Offshore ornithology baseline characterisation report of the Environmental Statement) with no

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Tier 1, Tier 2, Tier 3 projects
important site outside the SPA	Generation Assets alone in section 1.5 remains unchanged.	with no known areas of importance beyond the Morgan Generation Assets that kittiwake from the Cape Wrath SPA may utilise. The Morgan Generation Assets are therefore considered to not represent a barrier to kittiwake from the Irelands Eye SPA to ecologically important sites outside of the SPA. This conclusion is also considered applicable to the Morecambe Generation Assets.	known areas of importance beyond the Morgan Generation Assets that kittiwake from the Cape Wrath SPA may utilise. The Morgan Generation Assets are therefore considered to not represent a barrier to kittiwake from the Irelands Eye SPA to ecologically important sites outside of the SPA. • Projects considered in-combination are, with the exception of the West of Orkney offshore wind farm located beyond the generic mean-maximum foraging range of kittiwake (Woodward *et al.,* 2019). Many are located close to the coast and therefore there is limited areas beyond these projects that could be utilised by kittiwake from the SPA. It is therefore considered that no project considered in-combination will represent a barrier to kittiwake from the Irelands Eye SPA to ecologically important sites outside of the SPA.
Conclusion	**Adverse effects on the kittiwake qualifying feature, which undermine the conservation objectives of the Cape Wrath SPA, will not occur as a result of collision risk in-combination with the Morgan and Morecambe Offshore Wind Farms: Transmission Assets**	**Adverse effects on the kittiwake qualifying feature, which undermine the conservation objectives of the Cape Wrath SPA, will not occur as a result of collision risk in-combination with the Morgan and Morecambe Offshore Wind Farms: Transmission Assets and Morecambe Offshore Windfarm Generation Assets.**	**Adverse effects on the kittiwake qualifying feature, which undermine the conservation objectives of the Cape Wrath SPA, will not occur as a result of collision risk in-combination with the Morgan and Morecambe Offshore Wind Farms: Transmission Assets, Morecambe Offshore Windfarm Generation Assets, as well as Tier 1, Tier 2 and Tier 3 projects.**

1.7 Summary

1.7.1 Effects on site integrity

1.7.1.1 A summary of the assessments presented in this HRA Stage 2 ISAA Report, for those qualifying feature of SPAs and Ramsar for which LSE could not be discounted, is provided in the sections below. Table 1.86 presents the conclusions of adverse effects on integrity in relation to the Morgan Generation Assets alone and in-combination with other plans and projects.

Table 1.86: Summary of conclusions.

European Site	Relevant qualifying features	Project phase	Potential impact	Conclusion – Morgan Generation Assets alone	Conclusion – Morgan Generation Assets in-combination with other plans and projects
Morecambe Bay and Duddon Estuary SPA / Morecambe Bay Ramsar	Lesser black-backed gull Herring gull Breeding seabird assemblage	Operations and maintenance	Collision risk In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
Ribble and Alt Estuaries SPA and Ramsar	Lesser black-backed gull Breeding seabird assemblage	Operations and maintenance	Collision risk In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
Bowland Fells SPA	Lesser black-backed gull	Operations and maintenance	Collision risk In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
Copeland Islands SPA	Manx shearwater	Operations and maintenance	Disturbance and displacement from airborne sound and presence of vessels and infrastructure In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
Glannau Aberdaron ac Ynys Enlli / Aberdaron Coast and Bardsey Island SPA	Manx shearwater	Operations and maintenance	Disturbance and displacement from airborne sound and presence of vessels and infrastructure In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
Lambay Island SPA	Kittiwake Breeding seabird assemblage	Operations and maintenance	Disturbance and displacement from airborne sound and presence of vessels and infrastructure Collision risk In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.

European Site	Relevant qualifying features	Project phase	Potential impact	Conclusion – Morgan Generation Assets alone	Conclusion – Morgan Generation Assets in-combination with other plans and projects
	Herring gull *Larus argentatus* (non-breeding season)	Operations and maintenance	Collision risk In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
	Guillemot *Uria aalge* (non-breeding season) Razorbill *Alca torda* (non-breeding season)	Operations and maintenance	Disturbance and displacement from airborne sound and presence of vessels and infrastructure In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
Ireland's Eye SPA	Kittiwake	Operations and maintenance	Disturbance and displacement from airborne sound and presence of vessels and infrastructure Collision risk In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
Howth Head Coast SPA	Kittiwake	Operations and maintenance	Disturbance and displacement from airborne sound and presence of vessels and infrastructure Collision risk In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
Ailsa Craig SPA	Gannet Kittiwake Breeding seabird assemblage	Operations and maintenance	Disturbance and displacement from airborne sound and presence of vessels and infrastructure Collision risk In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
Wicklow Head SPA	Kittiwake	Operations and maintenance	Disturbance and displacement from airborne	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.

European Site	Relevant qualifying features	Project phase	Potential impact	Conclusion – Morgan Generation Assets alone	Conclusion – Morgan Generation Assets in-combination with other plans and projects
			sound and presence of vessels and infrastructure Collision risk In-combination effects.		
Rathlin Island SPA	Kittiwake Breeding seabird assemblage	Operations and maintenance	Disturbance and displacement from airborne sound and presence of vessels and infrastructure Collision risk In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
	Guillemot (non-breeding season) Razorbill (non-breeding season)	Operations and maintenance	Disturbance and displacement from airborne sound and presence of vessels and infrastructure In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
Skomer, Skokholm and the Seas off Pembrokeshire SPA	Kittiwake (non-breeding seasons) Breeding seabird assemblage	Operations and maintenance	Disturbance and displacement from airborne sound and presence of vessels and infrastructure Collision risk In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
	Lesser black-backed gull	Operations and maintenance	Collision risk In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
	Manx shearwater Guillemot (non-breeding season) Razorbill (non-breeding seasons)	Operations and maintenance	Disturbance and displacement from airborne sound and presence of vessels and infrastructure In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.

European Site	Relevant qualifying features	Project phase	Potential impact	Conclusion – Morgan Generation Assets alone	Conclusion – Morgan Generation Assets in-combination with other plans and projects
North Colonsay and Western Cliffs SPA	Kittiwake Breeding seabird assemblage	Operations and maintenance	Disturbance and displacement from airborne sound and presence of vessels and infrastructure Collision risk In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
	Guillemot (non-breeding seasons)	Operations and maintenance	Disturbance and displacement from airborne sound and presence of vessels and infrastructure In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
Grassholm SPA	Gannet	Operations and maintenance	Disturbance and displacement from airborne sound and presence of vessels and infrastructure Collision risk In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
Saltee Islands SPA	Gannet Kittiwake Breeding seabird assemblage	Operations and maintenance	Disturbance and displacement from airborne sound and presence of vessels and infrastructure Collision risk In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
	Guillemot *Uria aalge* (non-breeding season) Razorbill *Alca torda* (non-breeding season)	Operations and maintenance	Disturbance and displacement from airborne sound and presence of vessels and infrastructure In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.

European Site	Relevant qualifying features	Project phase	Potential impact	Conclusion – Morgan Generation Assets alone	Conclusion – Morgan Generation Assets in-combination with other plans and projects
Mingulay and Berneray SPA	Guillemot (non-breeding season) Razorbill (non-breeding season) Breeding seabird assemblage	Operations and maintenance	Disturbance and displacement from airborne sound and presence of vessels and infrastructure In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
The Shiant Isles SPA	Razorbill (non-breeding season) Breeding seabird assemblage	Operations and maintenance	Disturbance and displacement from airborne sound and presence of vessels and infrastructure In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
Isles of Scilly SPA / Isles of Scilly Ramsar	Lesser black-backed gull (non-breeding season) Great black-backed gull (non-breeding season) Breeding seabird assemblage	Operations and maintenance	Collision risk In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
	Manx shearwater	Operations and maintenance	Disturbance and displacement from airborne sound and presence of vessels and infrastructure In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
Handa SPA	Guillemot (non-breeding season) Razorbill (non-breeding season) Breeding seabird assemblage	Operations and maintenance	Disturbance and displacement from airborne sound and presence of vessels and infrastructure In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.

European Site	Relevant qualifying features	Project phase	Potential impact	Conclusion – Morgan Generation Assets alone	Conclusion – Morgan Generation Assets in-combination with other plans and projects
St Kilda SPA	Gannet (non-breeding season) Breeding seabird assemblage	Operations and maintenance	Disturbance and displacement from airborne sound and presence of vessels and infrastructure Collision risk In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
	Guillemot (non-breeding season) Fulmar Manx shearwater	Operations and maintenance	Disturbance and displacement from airborne sound and presence of vessels and infrastructure In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
Cape Wrath SPA	Kittiwake (non-breeding seasons) Breeding seabird assemblage	Operations and maintenance	Disturbance and displacement from airborne sound and presence of vessels and infrastructure Collision risk In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
	Guillemot (non-breeding seasons)	Operations and maintenance	Disturbance and displacement from airborne sound and presence of vessels and infrastructure In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
Flannan Isles SPA	Guillemot (non-breeding seasons) Breeding seabird assemblage	Operations and maintenance	Disturbance and displacement from airborne sound and presence of vessels and infrastructure In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
North Rona and Sula Sgeir SPA	Gannet (non-breeding seasons)	Operations and maintenance	Disturbance and displacement from airborne	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.

European Site	Relevant qualifying features	Project phase	Potential impact	Conclusion – Morgan Generation Assets alone	Conclusion – Morgan Generation Assets in-combination with other plans and projects
	Breeding seabird assemblage		sound and presence of vessels and infrastructure Collision risk In-combination effects.		
Buchan Ness to Collieston Coast SPA	Kittiwake (non-breeding seasons) Breeding seabird assemblage	Operations and maintenance	Disturbance and displacement from airborne sound and presence of vessels and infrastructure Collision risk In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
East Caithness Cliffs SPA	Kittiwake (non-breeding seasons) Breeding seabird assemblage	Operations and maintenance	Disturbance and displacement from airborne sound and presence of vessels and infrastructure Collision risk In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
Flamborough and Filey Coast SPA	Kittiwake (non-breeding seasons) Breeding seabird assemblage	Operations and maintenance	Disturbance and displacement from airborne sound and presence of vessels and infrastructure Collision risk In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
Forth Islands SPA	Gannet (non-breeding seasons) Breeding seabird assemblage	Operations and maintenance	Disturbance and displacement from airborne sound and presence of vessels and infrastructure Collision risk In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.

European Site	Relevant qualifying features	Project phase	Potential impact	Conclusion – Morgan Generation Assets alone	Conclusion – Morgan Generation Assets in-combination with other plans and projects
Hermaness, Saxa Vord and Valla Field SPA	Gannet (non-breeding seasons) Breeding seabird assemblage	Operations and maintenance	Disturbance and displacement from airborne sound and presence of vessels and infrastructure Collision risk In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
Rum SPA	Manx shearwater Breeding seabird assemblage	Operations and maintenance	Disturbance and displacement from airborne sound and presence of vessels and infrastructure In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
Sule Skerry and Sule Stack SPA	Gannet (non-breeding seasons Breeding seabird assemblage	Operations and maintenance	Disturbance and displacement from airborne sound and presence of vessels and infrastructure Collision risk In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
	Guillemot (non-breeding season)	Operations and maintenance	Disturbance and displacement from airborne sound and presence of vessels and infrastructure In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
Troup, Pennan and Lion's Heads	Kittiwake (non-breeding seasons) Breeding seabird assemblage	Operations and maintenance	Disturbance and displacement from airborne sound and presence of vessels and infrastructure Collision risk In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.

European Site	Relevant qualifying features	Project phase	Potential impact	Conclusion – Morgan Generation Assets alone	Conclusion – Morgan Generation Assets in-combination with other plans and projects
West Westray SPA	Kittiwake (non-breeding seasons) Breeding seabird assemblage	Operations and maintenance	Disturbance and displacement from airborne sound and presence of vessels and infrastructure Collision risk In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
Irish Sea Front SPA	Manx shearwater	Operations and maintenance	Disturbance and displacement from airborne sound and presence of vessels and infrastructure In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
North-west Irish Sea SPA	Kittiwake	Operations and maintenance	Disturbance and displacement from airborne sound and presence of vessels and infrastructure Collision risk In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
	Herring gull	Operations and maintenance	Collision risk In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
	Guillemot Razorbill	Operations and maintenance	Disturbance and displacement from airborne sound and presence of vessels and infrastructure In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
Seas off St Kilda SPA	Gannet	Operations and maintenance	Disturbance and displacement from airborne sound and presence of vessels and infrastructure	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.

European Site	Relevant qualifying features	Project phase	Potential impact	Conclusion – Morgan Generation Assets alone	Conclusion – Morgan Generation Assets in-combination with other plans and projects
			Collision risk In-combination effects.		
	Guillemot (non-breeding season) Fulmar	Operations and maintenance	Disturbance and displacement from airborne sound and presence of vessels and infrastructure In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.

1.8 References

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