




F I V E 
ESTUARIES
OFFSHORE WIND FARM

FIVE ESTUARIES
OFFSHORE WIND FARM
POTENTIAL COMPENSATION MEASURES
LONGLIST REPORT

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DEFINITION OF ACRONYMS

TERM	DEFINITION
AEoI	Adverse Effects on Integrity
AOE SPA	Alde-Ore Estuary Special Protection Area
DCO	Development Consent Order
EU	European Union
FFC SPA	Flamborough and Filey Coast Special Protection Area
GT	Gannet
HRA	Habitats Regulations Assessment
IROPI	Imperative Reasons of Overriding Public Interest
KW	Kittiwake
LBBG	Lesser Black-backed Gull
M&LS SAC	Margate and Long Sands Special Area of Conservation
NE	Natural England
PINS	Planning Inspectorate
RAG	Red-Amber-Green assessment
SNCBs	Statutory Nature Conservation Bodies
SAC	Special Area of Conservation
SCI	Site of Community Importance
VE	Five Estuaries Offshore Wind Farm
VE OWFL	Five Estuaries Offshore Windfarm Ltd
WID	Water Injection Dredging

1. BACKGROUND

1.1 FIVE ESTUARIES OWF

1.1.1 Five Estuaries Offshore Wind Farm (VE) is a proposed extension to the operational Galloper Offshore Wind Farm, which is located approximately 37 km off the coast of Suffolk, England (at its closest point).

1.1.2 As part of the DCO application, Five Estuaries Offshore Windfarm Ltd (VE OWFL) is required to present the information needed to undertake a Habitats Regulations Assessment (HRA). If the HRA process deems that Adverse Effects on Integrity (AEoI) cannot be excluded, a derogations process is followed. In the event that no alternative solutions can be found, and if there are imperative reasons of overriding public interest (IROPI), the final stage of the derogations process is to develop measures to compensate for harm to a site.

1.2 DEROGATION PREPARATION

1.2.1 In order to allow for sufficient time to engage with stakeholders and develop compensation plans, VE OWFL is investigating compensation options at this early stage in the pre-application period and does not prejudice the outcome of the ongoing HRA process. VE OWFL is identifying potential compensation measures for VE and creating a 'longlist' of all possible options. The longlisted options are based on the existing VE project proposal, experience with HRA derogation matters in the UK and stakeholder feedback received to date (See Appendix 1).

1.2.2 The longlist will be subject to refinement following a ranking criteria assessment (otherwise known as a Red-Amber-Green (RAG) assessment). The RAG assessment methodology is currently being developed and will take into account the latest advice and guidance on derogation matters, available supporting evidence, timescale of implementation and experience from other projects in the UK who have put forward a derogation case in support of an offshore wind DCO application etc. Ongoing work to address evidence gaps will be taken into account, as will any outputs of the wider HRA and associated consultation with statutory nature conservation bodies (SNCBs) and wider stakeholders.

1.2.3 Three documents will be used to inform the design of the ranking criteria against which the longlist of compensation options will be scored and narrowed down into a short list. These are the European Commission publication "*Managing Natura 2000 sites. The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC*" (European Commission, 2018); Defra guidance, currently under consultation, titled "*Best practice guidance for developing compensatory measures in relation to Marine Protected Areas*" (Defra, 2021); and the Natural England "*Checklist for compensatory measure submissions*" (Natural England, 2021).

1.2.4 This Potential Derogation Measures Longlist Report to Natural England summarises and accompanies VE OWFL's longlist of possible compensation measures under consideration for three high risk sites as agreed by NE through consultation (see meeting minutes from NE monthly project call, 8 November 2021) : Alde-Ore Estuary Special Protection Area (AOE SPA), Flamborough and Filey Coast Special Protection Area (FFC SPA), and Margate and Long Sands Special Area of Conservation (M&LS SAC).

2. SUMMARY OF OPTION TYPES

2.1 POTENTIAL SANDBANK COMPENSATION MEASURES

2.1.1 There are 19 potential benthic compensation options in the longlist of potential measures. These fall within four main themes:

- > Habitat improvement;
- > Threat reduction;
- > Habitat re-creation; and
- > Reserve re-creation.

HABITAT IMPROVEMENT

2.1.2 Two potential options have been identified under habitat improvement:

- > **Fisheries management:** Spatial reduction of bottom trawling across sandbanks.
- > **Enhancement/restoration** of the undesignated *Sabellaria spinulosa* (*S. spinulosa*) as a wider feature of the SAC.

2.1.3 Although the M&LS SAC does not have Annex I reef as a feature, there is evidence that *S. spinulosa* is present in the site (albeit in patchy areas forming crusts rather than reefs) and indicates the health of the sandbank system¹. Therefore, enhancement/restoration of this species establishment could be considered as an aspirational compensation measure which may be considered a Measure of Equivalent Environmental Benefit (MEEB) as noted in the draft Defra guidance (Defra, 2021).

2.1.4 Enhancement/restoration efforts could be informed by understanding recruitment and colonisation rates of *S. spinulosa* and protecting the sensitive areas of M&LS SAC at sensitive stages of its life cycle, allowing the area to have time to rejuvenate. It may also be useful to understand and reduce predation pressure on *S. spinulosa*.

2.1.5 Bottom trawling restrictions within M&LS SAC will remove the threat of habitat disturbance, damage and loss but is unlikely to be favourable to the fishing industry given that there is already an active byelaw restricting bottom towed gear within specific areas of M&LS SAC². A review of all available extant data on the extent, distribution and species/community structure of the sandbanks will enable an assessment of the locations of sensitive areas (i.e. locations of *S. spinulosa*). Data could be used, if appropriate to do so, to determine any known change in distribution and / or recoverability so that a judgement can be made on the potential for recolonisation rates of *S. spinulosa* to inform or update existing management or more sustainable fishing practices within the site. An assessment of existing fishing activity could be completed to understand if further changes or measures could be implemented to facilitate development of *S. spinulosa* reef. This work could inform consideration of extending the current byelaw area. Further engagement with NE, Marine Management Organisation and the Kent and Essex IFCA should be undertaken to explore the practicalities of extending or enhancing this area.

¹ JNCC site details: <http://jncc.defra.gov.uk/protectedsites/sacselection/sac.asp?EUCode=UK0030371>

² <https://www.gov.uk/government/publications/the-margate-and-long-sands-european-marine-site-specified-areas-bottom-towed-fishing-gear-byelaw>

HABITAT RECREATION

2.1.6 Three potential habitat re-creation options have been identified:

- > **Sediment budget increase:** establishing new sandbank areas (e.g. via coastal sandscaping and natural sediment reworking);
- > **Sediment budget maintenance:** a commitment to depositing all dredged material from seabed preparation or other sediment relocation works (i.e., sandwave clearance) within the Special Area of Conservation (SAC), providing its characteristics are closely matched to that of the site; and
- > **Sediment budget maintenance:** a commitment to limiting sandwave clearance within the SAC to agitation dredging (i.e., water injection dredging (WID)).

2.1.7 Coastal sandscaping projects could be used to increase the local sediment budget by depositing sandy sediment in intertidal areas close to M&LS SAC and relying on the sediment to be reworked and become part of the sandbank system. Initial identification and review of coastal frontages along the coastlines around the Outer Thames region including Kent, Essex and Suffolk, that are experiencing beach sediment loss is required to understand likely mechanisms in order to maximise the benefits.

2.1.8 Making efforts to maintain sediment or depositing new material within the sandbank system may also encourage new sandbank formation. However, consideration of existing channels that are used for navigation will need to be considered. Any risks to channels (dredged or undredged) could result in significant navigational safety risk and may therefore impact the feasibility of this measure. For that reason it is considered unlikely that this be progressed given the importance of the shipping routes within the region.

RESERVE CREATION

2.1.9 Two potential reserve creation options have been identified:

- > **Extending an Annex I designated SAC** boundary to include areas formed as biogenic reef and adding biogenic reef (or other MEEB feature) as a feature to the site; and
- > **Extending an Annex I designated SAC** boundary to include additional sandbanks outside of current boundary.

2.1.10 Both of these options could be achieved strategically through the development of the case to extend the site with other organisations and industries. However, a thorough understanding of the SAC/Site of Community Importance (SCI) designation process is required (including a consideration of its timeline against the likely need for this compensation to be delivered prior to any activity which may result in AEol) as well as the quality, sufficiency, and adequacy of the data requirements on the extent, distribution and species/community structure of the proposed areas for inclusion.

2.1.11 Given that the UK is no longer part of the European Union (EU) and M&LS SAC was originally designated as a European marine site, the process of designating sites as 'national site network sites' is currently not clear and requires thorough investigation and discussion with NE and DEFRA. a desk-based review may be required to understand the financial cost of this measure to other marine users.

2.1.12 VE OWFL could facilitate a SAC extension by supporting the designation process which would be undertaken by the relevant Statutory Nature Conservation Body (SNCB). This could be achieved through funding posts within the relevant SNCB to undertake all relevant assessment and consultation work. VE OWFL would need to seek to engage with the SNCBs to understand how this could be achieved.

THREAT REDUCTION

2.1.13 Eleven potential threat reduction options have been identified, under the following four general themes:

- > **Funding mechanisms** for: research on microplastics and contaminant loading across Greater Thames region; engagement with general public to raise awareness of and reduce marine litter and plastic waste and improve disposal and recycling; buying out or ending other harmful activities across sandbank structure;
- > **Debris removal:** removal of anthropogenic waste; facilitating the rapid recovery/retrieval of lost fishing equipment across the sandbanks; and removal of disused infrastructure across sandbanks;
- > **Control of marine invasive non-native species:** implementation of controls or active removal to minimise the spread and impact of INNS on a designated site; and
- > **Management of physical and chemical processes:** improving hydrodynamics across sandbanks; cross-industry engagement and management of aggregate dredging pressure (spatial or temporal); engagement with ports and shipping industry on use of WID as preferred dredging method; and improving water quality across sandbanks via strategic agreements with local water companies, local planning authorities and land owners.

2.1.14 Financial contributions to expand ongoing projects (such as the Thames Estuary Partnership's Dredging Liaison Group³ marine microplastics research and other citizen led marine litter clean-up initiatives) provides a potential opportunity for compensation on sandbanks by enabling a better understanding of the risks and sandbank sensitivity to large-scale impacts that are not manageable or mitigatable at a site-specific scale. Determination of how the research outputs could be used to inform measures for site improvement would need to be established as well as how to use the findings to inform policy, best practice, or management measures/byelaws. The delivery timescale would also need to be established to ensure the compensation would be deliverable in the required timescales. Marine debris and fishing gear removal measures have been proposed and accepted as a compensation measure for sandbanks as a result of the impact of the Norfolk Boreas OWF and Norfolk Vanguard construction. Measures including the removal of debris will require implementation plans and an understanding of the potential for marine debris removal measures to damage benthic habitats, inform whether planned marine debris removal on site would support restoration of protected habitats, and inform the methods for removal.

³ <https://www.thamesestuarypartnership.org/forums>

- 2.1.15 Marine non-native species have been recorded within the site, including razorshell *Ensis americanus*, the amphipod *Corophium sextonae*, and slipper limpet *Crepidula fornicata* (Natural England, 2022). Removing these species is likely to relieve competition and predation pressures on indigenous/key sandbank community species. The UKTAG (2008) paper reports that of the three invasive species recorded within the site, the presence of slipper limpet presents the highest risk to water bodies, with the amphipod species the lowest risk and razorshell risk unknown; therefore, to achieve the highest benefit the slipper limpet could be targeted. Recommended control measures for slipper limpet are dredging/manual collection as demonstrated by the French ARVAL programme (Fitzgerald, 2007; Syvret and Fitzgerald, 2008) or smothering with sediment as demonstrated in the Menai Strait in 2007 (Stockan and Fielding, 2017). Information to assess the effectiveness of the removal of marine non-native species is required on the cost benefit ratio and longevity of the measure (i.e., even with lots of time and money resource being invested, is this likely to have only limited, short-term gains?). Data on priority areas to target and the spatial limit for eradication is required. Consideration will also need to be given as to the potential effects of any removal activities - this will be considered as part of the next stage of the work to identify feasibility and overall benefits of the measure.
- 2.1.16 Improving hydrodynamics across the site will facilitate sediment disturbance, replenishment, and larval dispersal, however, the online conservation advice package notes that there is some uncertainty over how the physical energy objective could be developed (Natural England, 2022).
- 2.1.17 Management of aggregate dredging pressure is unlikely to be favourable to the aggregate industry, and similar to proposals for fishing activity management it may be prudent carry out a desk-based study to assess recoverability rates of sandbanks and its community structure (bearing in mind that the sandbank feature is known to be exposed to high energy and natural disturbance, whereby habitats are quickly recolonised (Tillin et al., 2020)) which may allow aggregate restriction areas to be alternately closed across the site.
- 2.1.18 Liaison and engagement with the local ports and shipping industry to implement best navigational and maintenance dredging practices (i.e., Water Injection Dredging) within the local area, has the potential to minimise impact on sedimentary regime by ensuring that sediment is maintained within the system and is available for sandbank sustainment. However, this will depend on the suitability of sediment for agitation dredging and whether it is an efficient method financially for the port operators. An understanding of how to implement any agreed best practice is also required, so that it is in place prior to AEoI on the sandbank feature occurring. Similarly, liaison, engagement and education of the water industry regulators and landowners within the catchment of M&LS SAC would need to take place, to ascertain buy in and to establish which water quality parameters are adversely affecting the feature along with their likely sources.

2.2 POTENTIAL ORNITHOLOGY COMPENSATION MEASURES

2.2.1 The sections below describe all longlisted compensation measures in respect of high risk species identified, namely Kittiwake (KW and Lesser Black-backed Gull (LBBG), grouped by the ecological mechanism for delivery. Consideration is also given to Gannet (GT) for which a number of these proposed compensation measures are also appropriate.

INCREASING BREEDING NUMBERS

2.2.2 The following compensation measures for increasing breeding numbers were longlisted:

- > **Onshore nesting structure:** Constructing a nesting structure at an onshore location with the aim to provide additional breeding spaces. Target species and site: KW (FFC SPA), GT (FFC SPA), LBBG (AOE SPA);
- > **Offshore nesting structure – new:** Constructing a nesting structure at an offshore location with the aim to provide additional breeding spaces. Target species and site: KW (FFC SPA), GT (FFC SPA), LBBG (AOE SPA);
- > **Offshore nesting structure – repurposed:** Repurposing an old structure, such as a decommissioned rig or platform, into an offshore nesting structure with the aim to provide additional breeding spaces. Target species and site: KW (FFC SPA), GT (FFC SPA), LBBG (AOE SPA);
- > **Enhancing colony establishment:** Playbacks and models can be used at potential nesting sites to facilitate the establishment of a new colony near an area of high food availability. This is generally playbacks of bird sounds (or typical noises from a colony) through a speaker and models of the target species on the rocks/ledges (Jones and Kress, 2012). . Target species and site: GT (FFC SPA); and
- > **Herring Gull control:** Control Herring Gull numbers to reduce competition for nest sites and predation. Target species and site: LBBG (AOE SPA).

REDUCING BREEDING FAILURE

2.2.3 The following compensation measures for reducing breeding failure were longlisted:

- > **Predator exclusion fencing:** Erect predator-proof fencing around a breeding colony, with the aim of reducing nest predation and thereby increasing breeding success. Target species and site: LBBG (AOE SPA);
- > **Predator management:** lethal or non-lethal predator control measures at a breeding colony to reduce nest predation and increase breeding success. Target species and site: KW (FFC SPA), LBBG (AOE);
- > **Peregrine Falcon diversionary feeding:** Provide alternative food for Peregrine Falcons to reduce Kittiwake mortality from predation. Target species and site: KW (FFC SPA);
- > **Peregrine Falcon alternative prey enhancement:** Indirect diversionary feeding by increasing wood pigeon productivity to provide additional wood pigeons as food source for Peregrine Falcon. Target species and site: KW (FFC SPA);
- > **Great Skua exclusion:** Exclude Great Skua from Kittiwake colony to reduce breeding failure due to Skua predation. Target species and site: KW (FFC SPA); and
- > **Storm defense construction:** Construct storm defenses around colonies vulnerable to storm damage to reduce breeding failure caused by extreme weather events. Target species and site: KW (FFC SPA).

REDUCING BYCATCH MORTALITY

2.2.4 The following compensation measure for reducing bycatch mortality was longlisted:

- > **Bycatch reduction equipment:** Use deterrent equipment attached to fishing gear to reduce ornithological bycatch, with the aim of increasing adult survival. Target species and site: KW (FFC SPA), GT (FFC SPA), LBBG (AOE SPA)

INCREASING FOOD AVAILABILITY

2.2.5 The following compensation measures for increasing food availability were longlisted:

- > **Fishery quota purchase:** Purchase fisheries quota for key prey species such as sandeel and/or sprat, thereby increasing food availability. Target species and site: KW (FFC SPA), GT (FFC SPA), LBBG (AOE SPA);
- > **Fisheries closure:** Close sandeel/sprat fisheries near SPA, creating fishery exclusion zone, with the aim of boosting local food availability for seabirds. Target species and site: KW (FFC SPA), GT (FFC SPA), LBBG (AOE SPA);
- > **Reduce fisheries quota:** Improve food availability through reducing fishing pressure by working with stakeholders to reduce sandeel/sprat quota in regions near the SPA. Target species and site: KW (FFC SPA), GT (FFC SPA), LBBG (AOE SPA);
- > **Fund sandeel alternatives research:** Sandeel are fished extensively for pig- and salmon-feed. This measure funds research and trials into alternatives to the use of sandeel, to thereby reduce fishing pressures and increase food availability for seabirds. Target species and site: KW (FFC SPA), GT (FFC SPA);
- > **Prey habitat enhancement:** Improve or provide additional seagrass habitat (e.g. seagrass used as spawning/nursery grounds) to increase fish populations. Target species and site: KW (FFC SPA), GT (FFC SPA);
- > **Directed offal discards:** Fund initiative to encourage fisheries to discard offal close to colonies and away from fishing activities. Target species and site: KW (FFC SPA), GT (FFC SPA); and
- > **Supplementary feeding:** Provide supplementary food near the nest during the breeding season. Target species and site: KW (FFC SPA), GT (FFC SPA), LBBG (AOE SPA)

REDUCING DISTURBANCE

2.2.6 The following compensation measures for reducing breeding disturbance were longlisted:

- > **Funding engagement with the watersports industry:** Funding engagement with the watersports industry to raise awareness on seabird disturbance from watersport activities. Target species and site: KW (FFC SPA), GT (FFC SPA);
- > **Warden funding:** Fund the employment of (additional) wardens to guide visitor behaviour and raise awareness on disturbance. Target species and site: KW (FFC SPA), GT (FFC SPA), LBBG (AOE SPA);
- > **Engagement with air space users:** Funding engagement with air space users with aim of achieving voluntarily avoidance of airspace above SPA during breeding season. Target species and site: LBBG (AOE SPA);
- > **Signage installation:** Install visitor signage with information on ways to reduce disturbance. Target species and site: KW (FFC SPA), GT (FFC SPA), LBBG (AOE SPA); and
- > **Alternative trail development:** At visitor sites, fund the design of alternative trails to avoid sensitive/key breeding areas. Target species and site: KW (FFC SPA), GT (FFC SPA), LBBG (AOE SPA).

REDUCING ANTHROPOGENIC MORTALITY

2.2.7 The following compensation measures for reducing breeding anthropogenic mortality were longlisted:

- > **End Gannet chick harvest:** Work with stakeholders to end licensed Sula Sgeir Gannet chick harvest. Target species and site: GT (FFC SPA);
- > **End Lesser Black-backed Gull culling:** End licensed culling of Lesser Black-backed Gull. Target species and site: LBBG (AOE SPA);
- > **Plastic waste removal:** Remove plastic waste at key non-SPA colonies to reduce mortality from entanglement. Target species and site: KW (FFC SPA), GT (FFC SPA);
- > **Aquaculture entanglement reduction:** Fund initiatives into solutions to reduce Gannet entanglement in aquaculture netting. Target species and site: GT (FFC SPA); and
- > **Marine litter engagement funding:** Fund engagement with general public to raise awareness of marine litter, threats to seabirds and ways to reduce plastic waste and improve disposal. Target species and site: KW (FFC SPA), GT (FFC SPA).

REDUCING OIL SPILL MORTALITY

2.2.8 The following compensation measure for reducing oil spill mortality was longlisted:

- > **Oil spill management improvements:** Facilitate improvements in oil spill prevention and management (e.g. research, advice and/outreach with shipping industry). Target species and site: KW (FFC SPA), GT (FFC SPA).

INCREASING PRODUCTIVITY

2.2.9 The following compensation measures for increasing productivity were longlisted:

- > **Marine SPA creation:** Designate new marine SPA in key offshore foraging location. Target species and site: KW (FFC SPA), GT (FFC SPA), LBBG (AOE SPA); and
- > **Nest material provisioning:** Provide nesting material to support breeding at offshore structures. This is a supporting measure to improve breeding at offshore sites. Target species and site: KW (FFC SPA), GT (FFC SPA)

NON-LIKE FOR LIKE OPTIONS

2.2.10 A range of non-like for like options, which do not directly target the impacted species but rather deliver wider ornithological conservation gains, were also considered in the longlist. Such non-like for like options are included as part of the hierarchy of compensatory measures as outlined by Defra in *“Best practice guidance for developing compensatory measures in relation to Marine Protected Areas”* (2021). The longlisted non-like for like options for VE is:

- > Protection of Common Tern colonies from flooding;
- > Construction and deployment of predator-proof nesting rafts for Common Tern;
- > Storm defences to protect Petrel and Guillemot nesting sites;
- > Use of artificial nesting burrows to provide breeding space for Puffins and Shearwaters;
- > Measures to reduce Fulmar, Guillemot and/or Razorbill bycatch in longline fisheries; and
- > Predator eradication at Shearwater and Petrel breeding sites.

3. NEXT STEPS

- 3.1.1 The longlist of options will be RAG assessed to rank the various compensation measures and refine them down to a shortlist of preferred options. Once all options have been ranked and a shortlist has been identified, the shortlisted options will be investigated in more detail to identify the most feasible, practicable and proportionate compensation options for VE OWFL.
- 3.1.2 In addition, evidence gaps associated with the compensation options are being outlined, and potential research work to fill evidence gaps identified. This information will be used to further inform the feasibility and potential efficacy of all measures.

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APPENDIX 1 FIVE ESTUARIES COMPENSATION MEASURES

BENTHIC COMPENSATION MEASURES

COMPENSATION TYPE	MEASURE	FEATURE	SITE	DESCRIPTION
Habitat improvement	Fisheries management	Sandbanks	M&LS SAC	Spatial reduction of bottom trawling across sandbanks / extending current byelaw area (see 'The Margate and Long Sands European Marine Site (Specified Areas) Bottom Towed Fishing Gear Byelaw 2017' available at https://www.gov.uk/government/publications/the-margate-and-long-sands-european-marine-site-specified-areas-bottom-towed-fishing-gear-byelaw)
Habitat improvement	Enhancement of <i>S. spinulosa</i> reef.	Annex I Reef	M&LS SAC	Enhancement/restoration of the undesignated <i>S. spinulosa</i> as a wider feature of the SAC.
Habitat re-creation	Establish new sandbank areas	Sandbanks	M&LS SAC	Coastal sandscaping to increase extent of habitats (maintaining or increasing the local sediment budget for new formation of sandbanks following natural reworking)
Reserve creation	Extend SAC and add feature	Annex I Reef	M&LS SAC	Extend the SAC boundary to include areas where Annex I <i>Sabellaria spinulosa</i> reef is found (rather than just encrustations) and add as feature to SAC. This could be achieved strategically through development of case to extend the site.
Reserve creation	Extend SAC	Sandbanks	M&LS SAC	Extend the SAC boundary to include additional sandbanks outside of current boundary. This could be achieved strategically through development of case to extend the site.
Threat reduction	Debris removal	Sandbanks	M&LS SAC	Removal of anthropogenic waste, not related to fishing gear across sandbanks.
Threat reduction	Debris awareness	Sandbanks	M&LS SAC	Fund engagement with general public to raise awareness of marine litter, and ways to reduce plastic waste and fishing equipment loss and improve disposal and recycling.
Threat reduction	Lost gear retrieval	Sandbanks	M&LS SAC	Facilitate rapid recovery of lost fishing equipment across the sandbanks.

COMPENSATION TYPE	MEASURE	FEATURE	SITE	DESCRIPTION
Threat reduction	Fisheries management	Sandbanks	M&LS SAC	Introduction of mechanism that would enable fisheries management to be re-considered.
Threat reduction	Marine activity restrictions	Sandbanks	M&LS SAC	Financial contribution to the cost of ending, or buying-out, other harmful activities across the sandbanks.
Threat reduction	Debris removal	Sandbanks	M&LS SAC	Removal of disused infrastructure across sandbanks
Threat reduction	Removing marine non-native species	Sandbanks & Annex I Reef	M&LS SAC	Invasive species eradication
Threat reduction	Hydrodynamics	Sandbanks & Annex I Reef	M&LS SAC	Improving hydrodynamics across sandbanks (removing threat of adverse impacts on sedimentary regime for sediment disturbance and replenishment, as well as encouraging larval dispersal)
Threat reduction	Water Quality	Sandbanks & Annex I Reef	M&LS SAC	Improving water quality across sandbanks (improving habitat for fauna of this habitat). Could be a strategic effort with local water companies, LPAs and landowners?
Threat reduction	Aggregate dredging activity management	Sandbanks & Annex I Reef	M&LS SAC	Further reduction/management of aggregate dredging pressure (spatial or temporal). Requires cross-industry engagement and agreement. Financial incentives?
Threat reduction	Management of navigational maintenance dredging methods	Sandbanks	M&LS SAC	Work with the ports and shipping industry to implement best navigational and maintenance dredging practices (i.e. Water Injection Dredging) within the local area, to minimise impact on sedimentary regime by ensuring that sediment is maintained within the system and is available for sandbank sustainment.
Habitat re-creation	Sediment budget	Sandbanks	M&LS SAC	Committing to depositing all material dredged or relocated for sand wave clearance within the SAC boundary to maintain local sediment budget within and around the SAC
Habitat re-creation	Sediment budget	Sandbanks	M&LS SAC	Committing to limiting sand wave clearance method to agitation dredging such as water injection dredging in order to maintain sediment budget within and around the SAC

ORNITHOLOGY COMPENSATION MEASURES

COMPENSATION TYPE	ECOLOGICAL MECHANISM	MEASURE	SPECIES	SITE	DESCRIPTION
Species recovery	Increasing breeding numbers	Onshore artificial nest site	Kittiwake	FFC SPA	Building an onshore Kittiwake nesting structure
Species recovery	Increasing breeding numbers	Onshore nesting structure	Gannet	FFC SPA	Building an onshore Gannet nesting structure
Species recovery	Increasing breeding numbers	Onshore nesting structure	Lesser Black-backed Gull	AOE SPA	Building an onshore Lesser Black-backed Gull nesting structure
Species recovery	Increasing breeding numbers	Offshore new nesting structure	Kittiwake	FFC SPA	Building a new offshore Kittiwake nesting structure
Species recovery	Increasing breeding numbers	Offshore new nesting structure	Gannet	FFC SPA	Building a new offshore Gannet nesting structure
Species recovery	Increasing breeding numbers	Offshore new nesting structure	Lesser Black-backed Gull	AOE SPA	Building a new offshore Lesser Black-backed Gull nesting structure
Species recovery	Increasing breeding numbers	Offshore repurposed nesting structure	Kittiwake	FFC SPA	Repurposing an old structure (e.g. decommissioned rig) into an offshore Kittiwake nesting structure
Species recovery	Increasing breeding numbers	Offshore repurposed nesting structure	Gannet	FFC SPA	Repurposing an old structure (e.g. decommissioned rig) into an offshore Gannet nesting structure
Species recovery	Increasing breeding numbers	Offshore repurposed nesting structure	Lesser Black-backed Gull	AOE SPA	Repurposing an old structure (e.g. decommissioned rig) into an offshore Lesser Black-backed Gull nesting structure
Species recovery	Reducing predation pressure	Predator exclusion fencing	Lesser Black-backed Gull	AOE SPA	Erect predator-proof fencing around a breeding colony to reduce predation
Species recovery	Reducing predation pressure	Predator management	Lesser Black-backed Gull	AOE SPA	Lethal/non-lethal predator control at breeding colony to reduce predation

COMPENSATION TYPE	ECOLOGICAL MECHANISM	MEASURE	SPECIES	SITE	DESCRIPTION
Threat reduction	Reducing bycatch mortality	Bycatch reduction deterrent equipment	Gannet	FFC SPA	Use deterrent equipment attached to fishing gear to reduce ornithological bycatch
Threat reduction	Reducing bycatch mortality	Bycatch reduction deterrent equipment	Kittiwake	FFC SPA	Use deterrent equipment attached to fishing gear to reduce ornithological bycatch
Threat reduction	Reducing bycatch mortality	Bycatch reduction deterrent equipment	Lesser Black-backed Gull	AOE SPA	Use deterrent equipment attached to fishing gear to reduce ornithological bycatch
Rights acquisition	Increasing food availability	Fishery quota purchase	Kittiwake	FFC SPA	Purchase fishery quota for sandeel and/or sprat
Rights acquisition	Increasing food availability	Fishery quota purchase	Gannet	FFC SPA	Purchase fishery quota for sandeel and/or sprat
Rights acquisition	Increasing food availability	Fishery quota purchase	Lesser Black-backed Gull	AOE SPA	Purchase fishery quota for sandeel and/or sprat
Species recovery	Increasing food availability	Fisheries closure	Kittiwake	FFC SPA	Close sandeel/sprat fisheries near SPA (fishery exclusion zone)
Species recovery	Increasing food availability	Fisheries closure	Gannet	FFC SPA	Close sandeel/sprat fisheries near SPA (fishery exclusion zone)
Species recovery	Increasing food availability	Fisheries closure	Lesser Black-backed Gull	AOE SPA	Close sandeel/sprat fisheries near SPA
Species recovery	Increasing food availability	Reduce fisheries quota	Kittiwake	FFC SPA	Work with stakeholders to reduce sandeel/sprat quota in regions near the SPA
Species recovery	Increasing food availability	Reduce fisheries quota	Gannet	FFC SPA	Work with stakeholders to reduce sandeel/sprat quota in regions near the SPA
Species recovery	Increasing food availability	Reduce fisheries quota	Lesser Black-backed Gull	AOE SPA	Work with stakeholders to reduce sandeel/sprat quota in regions near the SPA

COMPENSATION TYPE	ECOLOGICAL MECHANISM	MEASURE	SPECIES	SITE	DESCRIPTION
Species recovery	Increasing food availability	Funding sandeel alternatives research	Kittiwake	FFC SPA	Fund research and trials into sandeel alternatives for pig and salmon feed
Species recovery	Increasing food availability	Funding sandeel alternatives research	Gannet	FFC SPA	Fund research and trials into sandeel alternatives for pig and salmon feed
Threat reduction	Reducing disturbance	Engagement funding - watersports	Kittiwake	FFC SPA	Funding engagement with watersports industry to raise awareness on seabird disturbance from watersport activities
Threat reduction	Reducing disturbance	Engagement funding - watersports	Gannet	FFC SPA	Funding engagement with watersports industry to raise awareness on seabird disturbance from watersport activities
Threat reduction	Reducing disturbance	Warden funding	Kittiwake	FFC SPA	Fund additional wardens to monitor visitors and raise awareness on disturbance
Threat reduction	Reducing disturbance	Warden funding	Gannet	FFC SPA	Fund additional wardens to monitor visitors and raise awareness on disturbance
Threat reduction	Reducing disturbance	Warden funding	Lesser Black-backed Gull	AOE SPA	Fund additional wardens to monitor visitors and raise awareness on disturbance
Threat reduction	Reducing disturbance	Direct engagement funding - air space	Lesser Black-backed Gull	AOE SPA	Funding engagement with air space users with aim of achieving voluntarily avoidance of airspace above SPA during breeding season
Threat reduction	Reducing disturbance	Signage installation	Kittiwake	FFC SPA	Install visitor signage with information on ways to reduce disturbance
Threat reduction	Reducing disturbance	Signage installation	Gannet	FFC SPA	Install visitor signage with information on ways to reduce disturbance
Threat reduction	Reducing disturbance	Signage installation	Lesser Black-backed Gull	AOE SPA	Install visitor signage with information on ways to reduce disturbance

COMPENSATION TYPE	ECOLOGICAL MECHANISM	MEASURE	SPECIES	SITE	DESCRIPTION
Threat reduction	Reducing disturbance	Alternative trail development	Kittiwake	FFC SPA	Fund design of alternative trails to avoid sensitive/key areas
Threat reduction	Reducing disturbance	Alternative trail development	Gannet	FFC SPA	Fund design of alternative trails to avoid sensitive/key areas
Threat reduction	Reducing disturbance	Alternative trail development	Lesser Black-backed Gull	AOE SPA	Fund design of alternative trails to avoid sensitive/key areas
Species recovery	Reducing predation pressure	Crow control	Kittiwake	FFC SPA	Control crow population near SPA to reduce predation
Species recovery	Reducing breeding failure	Mammalian predator control	Kittiwake	FFC SPA	Control of mammalian predators at island colony to reduce predation
Species recovery	Reducing breeding failure	Peregrine Falcon diversionary feeding	Kittiwake	FFC SPA	Provide alternative food for Peregrine Falcons to reduce Kittiwake mortality from predation
Species recovery	Reducing breeding failure	Peregrine Falcon alternative prey enhancement	Kittiwake	FFC SPA	Indirect diversionary feeding: increase wood pigeon productivity to provide additional wood pigeons as food source for Peregrine falcon
Species recovery	Reducing anthropogenic mortality	End chick harvest	Gannet	FFC SPA	End licensed Sula Sgeir Gannet chick harvest
Species recovery	Reducing entanglement mortality	Plastic waste removal	Gannet	FFC SPA	Remove plastic waste at key non-SPA colonies to reduce mortality from entanglement
Species recovery	Reducing entanglement mortality	Plastic waste removal	Kittiwake	FFC SPA	Remove plastic waste at key non-SPA colonies to reduce mortality from entanglement

COMPENSATION TYPE	ECOLOGICAL MECHANISM	MEASURE	SPECIES	SITE	DESCRIPTION
Species recovery	Reducing anthropogenic mortality	End culling	Lesser Black-backed Gull	AOE SPA	End licensed culling of Lesser Black-backed Gull
Species recovery	Increasing food availability	Prey habitat enhancement	Kittiwake	FFC SPA	Improve or provide additional seagrass habitat (e.g. seagrass used as spawning/nursery grounds) to increase fish populations
Species recovery	Increasing food availability	Prey habitat enhancement	Gannet	FFC SPA	Improve or provide additional seagrass habitat (e.g. seagrass used as spawning/nursery grounds) to increase fish populations
Species recovery	Increasing food availability	Directed offal discards	Kittiwake	FFC SPA	Fund initiative to encourage fisheries to discard offal close to colonies and away from fishing activities
Species recovery	Increasing food availability	Directed offal discards	Gannet	FFC SPA	Fund initiative to encourage fisheries to discard offal close to colonies and away from fishing activities
Habitat re-creation	Increasing productivity	Marine SPA creation	Kittiwake	FFC SPA	Designate new marine SPA in key offshore foraging location
Habitat re-creation	Increasing productivity	Marine SPA creation	Gannet	FFC SPA	Designate new marine SPA in key offshore foraging location
Habitat re-creation	Increasing productivity	Marine SPA creation	Lesser Black-backed Gull	AOE SPA	Designate new marine SPA in key offshore foraging location
Species recovery	Increasing productivity	Nest material provision	Kittiwake	FFC SPA	Provide nesting material to support breeding at offshore structures
Species recovery	Increasing productivity	Nest material provision	Gannet	FFC SPA	Provide nesting material to support breeding at offshore structures
Threat reduction	Reduce breeding failure	Storm defence construction	Kittiwake	FFC SPA	Construct storm defences around colonies vulnerable to storm damage to reduce breeding failure

COMPENSATION TYPE	ECOLOGICAL MECHANISM	MEASURE	SPECIES	SITE	DESCRIPTION
Species recovery	Reducing predation pressure	Great Skua exclusion	Kittiwake	FFC SPA	Exclude Great Skua from Kittiwake colony
Species recovery	Reducing anthropogenic mortality	Aquaculture entanglement reduction	Gannet	FFC SPA	Reduce Gannet entanglement in aquaculture netting
Species recovery	Increasing breeding numbers	Enhancing colony establishment	Gannet	FFC SPA	Use playbacks and models to facilitate the establishment of a new colony near an area of high food availability
Species recovery	Improving food availability	Supplementary feeding	Kittiwake	FFC SPA	Provide supplementary food near the nest during the breeding season
Species recovery	Improving food availability	Supplementary feeding	Gannet	FFC SPA	Provide supplementary food near the nest during the breeding season
Species recovery	Improving food availability	Supplementary feeding	Lesser Black-backed Gull	AOE SPA	Provide supplementary food near the nest during the breeding season
Threat reduction	Reducing oil spill mortality	Oil spill management improvements	Kittiwake	FFC SPA	Facilitate improvements in oil spill prevention and management (e.g. research, advice, outreach)
Threat reduction	Reducing oil spill mortality	Oil spill management improvements	Gannet	FFC SPA	Facilitate improvements in oil spill prevention and management (e.g. research, advice, outreach)
Threat reduction	Reducing oil spill mortality	Oil spill management improvements	Lesser Black-backed Gull	AOE SPA	Facilitate improvements in oil spill prevention and management (e.g. research, advice, outreach)
Threat reduction	Reducing anthropogenic mortality	Engagement funding - plastics	Kittiwake	FFC SPA	Fund engagement with general public to raise awareness of marine litter, threats to seabirds and ways to reduce plastic waste and improve disposal

COMPENSATION TYPE	ECOLOGICAL MECHANISM	MEASURE	SPECIES	SITE	DESCRIPTION
Threat reduction	Reducing anthropogenic mortality	Engagement funding - plastics	Gannet	FFC SPA	Fund engagement with general public to raise awareness of marine litter, threats to seabirds and ways to reduce plastic waste and improve disposal
Species recovery	Increasing breeding numbers	Herring Gull control	Lesser Black-backed Gull	AOE SPA	control Herring Gull numbers to reduce competition for nest sites and predation
Threat reduction	Reducing breeding failure	Protection of colonies from flooding	Common tern	NA	This is a non-like-for-like compensation option targeting a different species than the one impacted. Construct flood protection around a Common Tern colony susceptible to flooding.
Species recovery	Reducing breeding failure	Provision of predator-proof nesting rafts (Dr. Craik)	Common tern	NA	This is a non-like-for-like compensation option targeting a different species than the one impacted. Construct and deploy predator-proof nesting raft to provide additional breeding spaces with reduced predation risk.
Threat reduction	Reducing breeding failure	Storm defences (Orkney & Shetland)	Petrel & guillemot	NA	This is a non-like-for-like compensation option targeting a different species than the one impacted. Construct storm defences at susceptible breeding sites to reduce breeding failure from extreme weather events.
Species recovery	Increasing breeding numbers	Artificial nesting burrows	Puffins & shearwaters	NA	This is a non-like-for-like compensation option targeting a different species than the one impacted. Provide artificial nesting burrows to increase available breeding sites.
Threat reduction	Reducing anthropogenic mortality	Longline bycatch mitigation	Fulmar	NA	This is a non-like-for-like compensation option targeting a different species than the one impacted. Implement mitigation measures to reduce Fulmar bycatch

COMPENSATION TYPE	ECOLOGICAL MECHANISM	MEASURE	SPECIES	SITE	DESCRIPTION
Species recovery	Reducing breeding failure	Predator eradication	Shearwater & petrel	NA	This is a non-like-for-like compensation option targeting a different species than the one impacted.
Threat reduction	Reducing anthropogenic mortality	Bycatch mitigation	Guillemot & razorbill	NA	This is a non-like-for-like compensation option targeting a different species than the one impacted. Implement mitigation measures to reduce Guillemot and Razorbill bycatch
Habitat improvement	Increasing habitat availability	Creation/protection of saltmarshes or wetland habitat	<i>avian community</i>	NA	This is a non-like-for-like compensation option targeting a different species than the one impacted. Create, enhance and/or protect saltmarsh or wetland habitats to increase habitat availability for the wider avian community.

The logo for Five Estuaries features the word "FIVE" in a large, sans-serif font. The letter "I" is grey, "V" is purple, and "E" is pink. To the right of "FIVE" are three wavy lines in blue, green, and yellow. Below "FIVE" is the word "ESTUARIES" in a large, grey, sans-serif font, and below that is "OFFSHORE WIND FARM" in a smaller, grey, sans-serif font.

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