



JNCC, Natural England and Cefas position on
the use of quieter piling methods and noise
abatement systems when installing offshore
wind turbine foundations

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Summary

The availability of quieter installation methods and noise abatement systems (NAS), combined with evolving policies and regulations, makes adopting these technologies both sensible and essential.

Given the expected levels of construction in the coming years and the reliance of the renewable industry on impact piling when installing infrastructure, quieter installation methods and/or NAS should always be considered as primary and/or secondary mitigation measures when planning or undertaking impact piling.

Introduction

Growing concerns over the effects of unabated pile driving noise on marine protected species have led the [Joint Nature Conservation Committee](#) (JNCC), [Natural England](#) (NE) and the [Centre for the Environment, Fisheries and Aquaculture Science](#) (Cefas) to, in their capacities as statutory and/or scientific advisors, take a fresh look at the scientific evidence and regulatory process relevant to offshore windfarm construction.

Standard marine mammal mitigation measures (e.g. pre-piling searches and acoustic deterrents) are used during pile driving to reduce potential injury effects from underwater noise. However, the risk of disturbance resulting from piling noise occurs at much greater distances than can be mitigated with standard measures.

This joint position has considered a review of available scientific evidence (e.g. Cefas, 2024, Seiche 2024) alongside industry engagement (e.g. Merchant and Robinson, 2020; MMO, 2024). These confirm that options for using quieter installation methods and NAS are logistically feasible throughout UK shelf seas and are available to developers undertaking impact piling in UK waters.

This statement focusses on offshore renewables due to the large number of projects planned to be installed in the coming years and the scale of piling that may be associated with them. We are aware other industries may use impact piling when installing infrastructure and recommend they also consider whether quieter installation methods and/or NAS are needed when undertaking this piling.

Our Position

- We advise that quieter installation methods and/or NAS should always be considered as primary and/or secondary mitigation measures when planning to undertake impact piling in the marine environment.
- We recommend that quieter installation methods and/or NAS are considered early in the project design process to reduce the risk of delay to licence

applications, mitigation plans and site integrity plans that may be required. This will also provide sufficient time to procure required equipment.

- We strongly recommend modelling piling with the use of quieter installation methods and/or NAS in addition to the worst-case scenarios when predicting injury ranges in impact assessments. This will ensure that regulators and developers are well-informed about the available risk reduction options. This is crucial for assessing and managing cumulative impacts from multiple activities, helping regulators reduce risks to specific habitats and species.
- We consider the application of these technologies as a condition in future Development Consent Order (DCO) / deemed Marine Licences (dML) to be 'necessary'. There are clear policy and regulatory drivers for the deployment of quieter installation methods and/or NAS to reduce underwater noise.
- We recommend regulators bring in a requirement that European Protected Species (EPS) licences for disturbance to cetacean EPS species from offshore wind pile driving will only be accepted if quieter installation methods and/or NAS are considered, to inform Test 2 of the application process, that there are no satisfactory alternatives.
- We advise that all Site Integrity Plans (SIPs) for projects in harbour porpoise Special Areas of Conservation (SACs) must consider quieter installation methods and/or NAS as a measure.
- While this position focusses on marine mammals, fish are also susceptible to injury, disturbance and death from underwater noise and would benefit from the application of quieter installation methods and/or NAS. The implementation of these methods could reduce the need for seasonal piling restrictions, for example to protect spawning fish, thereby giving developers a wider construction window within a single year.

Incorporating this advice into regulatory processes

a) Development Consent Orders and deemed Marine Licences

Renewables developments in English and Welsh waters which generate more than 100MW energy are considered Nationally Significant Infrastructure Projects (NSIPs) under the Planning Act 2008. These follow a separate consenting route from standard marine licences required under the Marine and Coastal Access Act (MCAA) 2009, and consents are granted by the relevant Secretary of State rather than the relevant regulator. The Planning Inspectorate examines applications on behalf of the Secretary of State and make recommendations on whether consent, known as Development Consent Orders (DCOs), can be issued.

NSIPs must also meet marine licensing requirements under the MCAA, but the Planning Act allows DCOs to include provisions for deemed marine licences. This deemed marine licence (dML) is included within the DCO as a specific Schedule.

The MMO/Natural Resources Wales (NRW) (depending on location) must be involved when developing the dML as they will be responsible for post-consent monitoring, variation, enforcement, and revocation of provisions relating to the marine environment. Alternatively, developers can choose to apply to the MMO or NRW for a separate marine licence.

When issuing DCOs and associated dMLs, the regulator can consider whether otherwise unacceptable developments can be made acceptable with conditions or planning obligations. However, these conditions must pass the five tests of the [National Planning Policy Framework](#), including whether the condition is 'necessary to make the development acceptable in planning terms' and 'reasonably related in scale and kind to the development'.

DCO/dMLs for offshore wind farms usually include a condition to submit and agree a marine mammal mitigation plan (MMMP) with the MMO/NRW post-consent but ahead of piling commencing. Draft MMMPs are submitted as part of the DCO application process although in the past, these have generally only considered NAS as a potential consideration or option if required. To date, the use of quieter installation methods and/or NAS have not been included as separate conditions in DCO/dMLs issued for offshore wind developments.

We advise that quieter installation methods and/or NAS should always be considered when designing offshore renewable developments and be included as primary and/or secondary mitigation measures when developing draft MMMPs to support DCO applications. We also advise that impact assessments should demonstrate the effect quieter installation methods and/or NAS can have on predicted injury ranges for the piling scenarios considered in the assessment. This will ensure that regulators are well-informed about the potential risks to marine mammals from piling and the available risk reduction options, highlighting the benefits of these methods in the design envelope and MMMP.

We also consider the application of quieter installation methods and/or NAS as a stand-alone condition in DCO/dMLs to be 'reasonable' given options for these are available to developers for use in UK waters (based on currently available information). In addition, we consider them 'necessary' given the current policy and regulatory drivers to reduce underwater noise as set out below and in [Defra's Marine Noise Policy Paper](#). Including a stand-alone condition to apply for these methods (separate from and in addition to the need for a MMMP) would provide confidence they will be considered appropriately when finalising design envelopes and mitigation plans, which can occur several years after the DCO/dML has been granted. This will strengthen confidence in the conclusions of the impact assessment and support policy to reduce underwater noise levels in UK seas.

b) Marine licences issued directly under MCAA

Renewables developments in English and Welsh waters which generate less than 100MW are not considered NSIPs and therefore do not go through the NSIP

consenting process. Instead, these require a marine licence (ML) direct from MMO/NRW under the MCAA.

Though smaller in energy output than NSIPs, these projects can still significantly impact the marine environment. Subsequently, our advice regarding DCOs/dMLs also applies to new marine licences awarded for these projects.

c) European Protected Species (EPS)

If there is a risk of injury or disturbance of EPS that cannot be removed or sufficiently mitigated through alternative methods or measures, then the activity may still be permitted to go ahead under an EPS licence. This is obtained in addition to the (above) required permits/licences. For piling activities, EPS licence applications are typically submitted approximately six months prior to construction commencing (so post-DCO/ML consent). The issuing of an EPS licence should not be considered as a replacement to undertaking all measures possible to reduce impacts and is contingent on three tests being met. These are ([JNCC et al. 2010](#)):

- i. Purpose: Only activities carried out for certain purposes can be licensed. These include for 'imperative reasons of over-riding public interest including those of a social or economic nature and beneficial consequences for the environment' and 'scientific and educational purposes'.
- ii. Satisfactory alternatives: Licences can only be granted if the authority considering the application is satisfied that there is no satisfactory alternative. This includes being confident that, based on the best available information, alternatives were sought that would not impact on EPS and that none were found, or they were not satisfactory.
- iii. Favourable Conservation Status: Licences can only be granted where the authorised activity will not be detrimental to the maintenance of the populations of the species concerned at a Favourable Conservation Status (FCS) in their natural range.

EPS licences are often required for offshore renewables developments in relation to disturbance from impact piling, which can occur over many months. Until recently, there has been uncertainty regarding the availability of quieter installation methods and/or NAS for UK developments and a general expectation by developers that these methods will not be required when piling. As a result, the use of these methods is often not included when design envelopes are refined post-project consent. This means they are not considered when applying for an EPS licence, and procurement of such equipment so close to piling commencing can be problematic.

Based on currently available evidence that demonstrates that options for using quieter installation methods and NAS are logistically feasible and available (see Summary of supporting evidence), we consider that the second test of 'no satisfactory alternative' to the proposed activity will be unlikely to be met in most instances that involve piling for offshore wind developments going forward. This is

unless quieter installation methods and/or NAS have been fully explored for their applicability and no satisfactory alternative found.

While applications for EPS licences are submitted post-DCO/ML consent, the requirement for such licences can often be predicted at the DCO/ML application stage. To facilitate inclusion of these methods in EPS licence applications and prevent delays in the awarding of those licences, consideration of these methods and their inclusion into design envelopes should be considered/incorporated as early as possible in the project design process i.e. pre-DCO/ML application.

d) Developments within harbour porpoise SACs

When applying for DCOs, marine licences (deemed or otherwise) and EPS licences, Habitats Regulation Assessments (HRA) are required which must demonstrate adverse effects on site integrity (AEoSI) to Special Areas of Conservation (SACs) can be avoided, reduced or mitigated.

JNCC, NE and the Department of Agriculture, Environment and Rural Affairs in Northern Ireland (DAERA) published advice on what could constitute significant disturbance within harbour porpoise SACs in English, Welsh and Northern Irish waters in 2020 ([JNCC et al. 2020](#)). NRW have also published additional guidance on assessing disturbance in harbour porpoise sites in Welsh waters ([NRW 2023](#)). Both these documents recommend the use of spatial/temporal thresholds to manage noise disturbance within these SACs. Specifically, noise disturbance within a harbour porpoise SAC from a plan or project, individually or in combination, is considered to be significant if it excludes harbour porpoise from more than:

1. 20% of the relevant area (summer/winter) of the site in any given day, or
2. An average of 10% of the relevant area of the site over a given season.

Given the expected levels of construction in or near these harbour porpoise SACs in coming years, there are concerns these disturbance thresholds will be breached without the use of quieter installation methods and/or NAS. We share these concerns and advise that developers should always consider quieter installation methods and/or NAS when planning piling in these sites. Should applicants argue against using such measures, they must provide strong/robust justifications with supporting evidence. This will be reviewed by the relevant regulator in consultation with the relevant SNCB to assess whether it is deemed appropriate. Application of quieter installation methods and/or NAS will be critical to ensure construction can continue at pace within these protected areas. Without it, some project activities may have to be delayed to prevent the disturbance thresholds being breached.

Site Integrity Plans (SIPs)

DCOs/dMLs for projects that overlap with SACs may include a requirement for a Site Integrity Plan (SIP) to be produced by the developer and discharged by the relevant regulator. These were introduced in the [Review of Consents](#) (RoC) undertaken when

the Southern North Sea SAC for harbour porpoise was designated. The conclusion in this review was that there would be no adverse effect from constructed projects, but unconstructed projects was underpinned by a requirement for developers to undertake new, additional measures to mitigate disturbance to harbour porpoise.

The RoC Appropriate Assessment concluded this could be achieved through the insertion of an additional condition to implement a SIP before the commencement of any offshore activity with the potential to adversely affect this site, and subsequent dMLs have included a SIP requirement. The Appropriate Assessment further concluded that SIPs must contain measures suitable to stay within the disturbance thresholds for underwater noise set out in the SNCB guidance ([JNCC et al. 2020](#)). SIPs must be submitted to the MMO for approval no later than six months before construction is to commence, and they will only be approved if the MMO is satisfied (in consultation with SNCBs) that the project either alone or in-combination with other plans or projects, will not exceed the disturbance thresholds presented in [JNCC et al. 2020](#). Despite anything to the contrary in any licence or consent, the project must be carried out in accordance with the approved SIP.

We advise that all SIPs for piling in harbour porpoise SACs must consider quieter installation methods and/or NAS as a measure, to ensure the disturbance thresholds are not breached either alone or in-combination with other plans and projects. Not using these methods could cause delays both to the project for which the SIP relates to and other projects planning on undertaking work within the site. This includes, for example, delays in completing works should timetables slip e.g. because of bad weather and need to be completed in the following year/season. License applications which do not consider or justify not using quieter installation methods and/or NAS may face consenting difficulties.

e) Marine mammal mitigation for injury

At present, MMMPs for offshore pile driving are primarily developed to reduce the risk of injury to marine mammals to a negligible level. To mitigate this risk, they rely on soft start protocols, searches for marine mammals in a defined mitigation zone, and intentional displacement of animals using acoustic deterrent devices (ADDs). Thus far, MMMPs have not needed quieter installation methods and/or NAS to reduce the risk of injury to negligible levels, because the injury distances have been mitigatable using these other methods. However, substantial increases in pile diameters and hammer energies being proposed in licence applications mean it is less likely these measures will be sufficient to reduce the risk of injury in the future. Therefore, going forward, we advise the use of quieter installation methods and/or NAS should also be considered as standard practice as part of MMMPs to reduce the risk of injury in addition to disturbance. This would also reduce the need for EPS licences for injury.

f) Mitigation for fish species

A final point relates to mitigation to reduce risks to fish species. While this position focusses on marine mammals, fish are also susceptible to injury, death and disturbance from underwater noise and benefit from the application of quieter installation methods and/or NAS. The implementation of these methods could reduce the need for seasonal piling restrictions, thereby giving developers a wider construction window within a single year and help facilitate an overall quicker installation process.

Supporting evidence

The following is a summary of evidence considered when preparing this position:

ERM 2022: An approach to impulsive noise mitigation in English waters.

This report proposed and assessed management approaches for the abatement of impulsive underwater noise to reduce marine mammal disturbance from piling activities associated with offshore wind development in English waters. A modelling exercise using the harbour porpoise disturbance thresholds and the Southern North Sea SAC as an example, demonstrated that the then Government's offshore wind ambitions (50GW installed by 2030) were likely to be hindered if the status quo is maintained (i.e. no noise abatement), with modelling showing disturbance threshold exceedances for this site as early as summer of 2023.

Cefas 2022: Risk mapping of impulsive noise pollution in UK marine protected areas.

This study used risk mapping techniques to assess the effectiveness of the disturbance thresholds for harbour porpoise SACs in English and Welsh waters. It concluded there was a clear risk of breaching the thresholds and the use of noise abatement techniques could significantly reduce overall noise exposure.

Cefas 2024: Evidence on the efficacy of underwater noise abatement.

A review of scientific evidence was undertaken, drawing on the outcomes of a stakeholder noise abatement workshop held in 2019 (Merchant and Robinson, 2020), available peer-reviewed papers and experience gained by the German Federal Maritime and Hydrographic Agency when implementing the German noise threshold. The 2019 workshop concluded that it is feasible to deploy NAS at all locations where offshore wind farms are proposed in UK waters and the review summarises evidence of sound reduction by different NAS.

MMO 2024: MMO Noise Reduction Workshop Minutes.

In March 2024, the Marine Management Organisation (MMO) held a workshop focussed on investigating opportunities and blockers for noise reduction methods for piling activities. This workshop was also an opportunity for regulators and policy makers to forewarn industry that from 2025 onwards, they should expect to see

changes in the way noise from piling is managed in English waters, given the policy direction of travel, increase in marine noise, SNCB advice, increasing evidence base and advancements in NAS technology. NAS suppliers were invited to present on their technologies and the workshop demonstrated that the largest challenge faced by industry when considering NAS related to cost and vessel availability, rather than efficacy of the systems.

Seiche 2024: A noise limit for offshore wind pile driving: feasibility assessment and pilot programme design.

Seiche were commissioned by Defra to investigate the feasibility of introducing an offshore wind piling noise decibel limit in English and Welsh waters. This work included underwater acoustic modelling for piling scenarios predicted to occur in UK waters in the next ten years. The study concluded that without noise abatement, a German style limit of 160 dB re 1 $\mu\text{Pa}^2\text{s}$ sound exposure level at 750m from a pile would be exceeded for all 61 scenarios modelled. The greatest injury ranges were predicted for low frequency cetaceans, and the analysis confirmed that larger hammer energies and pile diameters would result in higher source levels and therefore need more mitigation than smaller piles installed with lower energy.

Regulatory and policy drivers

Marine mammals have a long history of legal protection in the UK. Key for the context of this statement is the suite of Habitats Regulations (see Table 1), which transposed the EC Habitats Directive into UK law. As European Protected Species under these legislation, it is an offence to deliberately kill, injure, capture or disturb cetaceans throughout their natural range. There is also a requirement to designate protected areas (SACs) for harbour porpoise, bottlenose dolphin, grey and harbour seal. When applying for consent to develop in the marine environment, applicants are required to demonstrate impacts to these species and sites will not occur, or they can be mitigated.

In addition to these protections, there are several policy drivers to reduce man-made noise in the marine environment, which would be supported by using quieter installation methods and/or NAS:

- The [Marine Strategy Regulations 2010](#): the UK Government is required to take the necessary measures to achieve or maintain Good Environmental Status (GES). This includes achieving GES for underwater noise by reducing both impulsive and continuous noise to levels that do not adversely affect populations of marine animals, as laid out in the [UK Marine Strategy](#).
- The [Environmental Targets \(Marine Protected Areas\) Regulations 2023](#): this includes a target to restore at least 70% of protected features in relevant Marine Protected Areas to a favourable condition by 2042, with the rest in a recovering condition. To meet this target, noise needs to be kept below the

disturbance thresholds to maintain favourable conditions in harbour porpoise SACs.

- Defra’s Marine Noise Policy Paper: published in January 2025, this sets out that *“From January 2025, given the expected increase in noise levels over the coming years, and the above outlined policy commitments, we expect that all offshore wind pile driving activity across all English waters will be required to demonstrate that they have utilised best endeavours to deliver noise reductions through the use of primary and / or secondary noise reduction methods in the first instance”*.
- The [North-East Atlantic Environment Strategy](#) 2030 (NEAES 2030): this commits OSPAR (to which the UK is a Contracting Party) to producing a regional action plan of measures to reduce underwater noise pollution by 2025.

Mitigation hierarchy

The Institute of Environmental Management and Assessment (IEMA) Impact Assessment Guidelines (Implementing the mitigation hierarchy from concept to construction, [IEMA 2024](#)) classifies mitigation measures into one of three key types:

1. Primary mitigation: these are measures which form an inherent part of the project design.
2. Secondary mitigation: typically for construction-related impacts, these measures require further activity to achieve the anticipated outcome.
3. Tertiary mitigation: these measures are required regardless of any EIA assessment, as they are imposed, for example, because of legislative requirements and/or standard sectoral practices.

We have applied these definitions when referring to the application of mitigation measures in this document.

References and weblinks

Table 1. List of relevant references, legislation and weblinks.

Reference	Full URL
Centre for the Environment, Fisheries and Aquaculture Science home page	https://www.cefasc.co.uk/
Natural England home page	https://www.gov.uk/government/organisations/natural-england
Joint Nature Conservation Committee home page	https://jncc.gov.uk/
Cefas 2024: Evidence on the efficacy of underwater noise abatement	https://hub.jncc.gov.uk/assets/e1d38ce8-9bc6-4fb5-b867-f7f595caa25a#cefasc-noise-abatement-evidence-review.pdf
MMO Noise Reduction Workshop Minutes 2024	https://www.gov.uk/government/organisations/marine-management-organisation
Defra Marine Noise Policy Paper	https://www.gov.uk/government/publications/reducing-marine-noise
National Planning Policy Framework	https://www.gov.uk/guidance/national-planning-policy-framework
JNCC <i>et al.</i> 2010: The protection of marine European Protected Species from injury and disturbance. Guidance for the marine area in England and Wales and the UK offshore marine area	https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/850708/Draft_Guidance_on_the_Protection_of_Marine_European_Protected_Species_from_Injury_and_Disturbance.pdf
JNCC <i>et al.</i> 2020: JNCC Report No 654: Guidance for assessing the significance of noise disturbance against conservation objectives of harbour porpoise SACs	https://hub.jncc.gov.uk/assets/2e60a9a0-4366-4971-9327-2bc409e09784
NRW 2023: NRW's position on assessing behavioural disturbance of harbour porpoise from underwater noise	https://naturalresources.wales/media/696755/ps017-nrws-position-on-assessing-behavioural-disturbance-of-harbour-porpoise-phocoena-phocoena-from-underwater-noise-30.pdf

Reference	Full URL
UK Habitats Regulations: a) The Conservation of Habitats and Species Regulations 2017 b) The Conservation of Offshore Marine Habitats and Species Regulations 2017	a) https://www.legislation.gov.uk/ukxi/2017/1012/contents b) https://www.legislation.gov.uk/ukxi/2017/1013/contents
The Marine Strategy Regulations 2010	https://www.legislation.gov.uk/ukxi/2010/1627/contents
Marine Strategy part one: UK updated assessment and Good Environmental Status	https://www.gov.uk/government/publications/marine-strategy-part-one-uk-updated-assessment-and-good-environmental-status
The Environmental Targets (Marine Protected Areas) Regulations 2023	https://www.legislation.gov.uk/ukxi/2023/94/contents/made
North-East Atlantic Environment Strategy (NEAES) 2030	https://www.ospar.org/convention/strategy
Merchant and Robinson, 2020	https://www.researchgate.net/publication/339070181_Abatement_of_underwater_noise_pollution_from_pile-driving_and_explosions_in_UK_waters
ERM 2022: An approach to impulsive noise mitigation in English waters	https://sciencesearch.defra.gov.uk/ProjectDetails?ProjectId=21308
Cefas 2022: Risk mapping of impulsive noise pollution in UK marine protected areas	https://sciencesearch.defra.gov.uk/ProjectDetails?ProjectId=21304
Seiche 2024: A noise limit for offshore wind pile driving: feasibility assessment and pilot programme design	https://sciencesearch.defra.gov.uk/ProjectDetails?ProjectId=21716
Planning Act 2008	https://www.legislation.gov.uk/ukpga/2008/29/contents
Review of consented offshore wind farms in the Southern North Sea harbour porpoise Special Area of Conservation	https://www.gov.uk/government/publications/review-of-consented-offshore-wind-farms-in-the-southern-north-sea-harbour-porpoise-special-area-of-conservation
IEMA 2024: Institute of Environmental Management and Assessment (Impact Assessment Guidelines: Implementing the Mitigation Hierarchy from Concept to Construction	https://www.iema.net/media/oone2qce/iema-mitigation-in-eia-guidance-final.pdf