

Norfolk Vanguard Offshore Wind Farm Harbour Porpoise Special Area of Conservation: Southern North Sea.

Conservation Objectives and Advice
on Operations

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**Harbour Porpoise (*Phocoena phocoena*)
Special Area of Conservation:
Southern North Sea**

Conservation Objectives and Advice on Operations

March 2019

Advice under Regulation 21 of The Conservation of Offshore Marine Habitats and Species Regulation 2017 and Regulation 37(3) of the Conservation of Habitats and Species Regulations 2017

Further information

This document is available as a pdf file on the JNCC website for download if required (www.jncc.defra.gov.uk).

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Summary of Conservation Objectives and Advice on Operations

The Conservation Objectives and Advice on Operations are set out for the Southern North Sea Special Area of Conservation (SAC) for harbour porpoise (*Phocoena phocoena*). The site covers both inshore (within 12 nautical miles of coast) and offshore (beyond 12 nautical miles of coast) waters where Natural England (NE) and the Joint Nature Conservation Committee (JNCC) have respective advisory responsibilities as the Statutory Nature Conservation Bodies (SNCB).

The general objective of achieving or maintaining Favourable Conservation Status (FCS) for all species and habitat types listed in Annexes I and II of the Habitats Directive needs to be translated into Conservation Objectives for SACs. These objectives describe the condition to be achieved by a site for it to contribute in the best possible way to achieving FCS at the national, bio-geographical and European level¹. The Advice on Operations is site-specific but based on a broad assessment of the sensitivity of the harbour porpoise to anthropogenic pressures at a UK scale.

The advice in this document has been developed using the best available scientific information and expert interpretation as of February 2019. The advice provided here may be subject to change as our knowledge about the site and the impacts of human activities improves.

To ensure the site contributes in the best possible way to achieving FCS, management of human activities occurring in or around the site is required if these activities are likely to have an adverse impact (directly or indirectly) on the integrity of the site, with regards to its Conservation Objectives. It should be noted that as European Protected Species under Annex IV of the Habitats Directive, harbour porpoises are already strictly protected throughout their European range. As such, several conservation measures are already in place in the UK.

To achieve the Conservation Objectives for the Southern North Sea SAC, the Relevant² and Competent³ Authorities should consider human activities within their remit which might affect the integrity of the site.

¹ <http://jncc.defra.gov.uk/PDF/comm02D07.pdf>

² Relevant Authorities are those who are already involved in some form of relevant marine regulatory function and would therefore be directly involved in the management of a marine site lying within territorial waters. The bodies which may be relevant authorities are listed in Regulation 6 of the Conservation of Habitats and Species Regulations 2017. All Relevant Authorities are also Competent Authorities.

³ Competent Authorities are defined in Regulation 5 of the Conservation of Offshore Marine Habitats and Species Regulations 2017 and Regulation 7 of the Conservation of Habitats and Species Regulations 2017. In summary, a Competent Authority is any person or organisation that has the legally delegated or invested authority (e.g. Minister, government department, public body of any kind or statutory undertaker) to perform a designated function.

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1 Introduction

1.1 Background

Initial advice on a network of sites identified within UK waters for harbour porpoise (*Phocoena phocoena*) was submitted to UK and Devolved Governments as a series of draft SACs in June 2015. The sites were identified within the UK portions of Management Units (MUs⁴) defined for the species (ICES, 2014; IAMMWG, 2015). The Welsh and Northern Irish Governments, along with Defra on behalf of England and relevant offshore waters, gave approval for sites within their areas of jurisdiction to proceed to consultation (January to May 2016). In light of the responses to the consultation, five sites were submitted to the European Commission as candidate SACs in January 2017. These five sites were adopted by the EC as Sites of Community Importance on 12 December 2017 and designated as SACs by Ministers on 26th February 2019. These sites are shown in Figure 1.

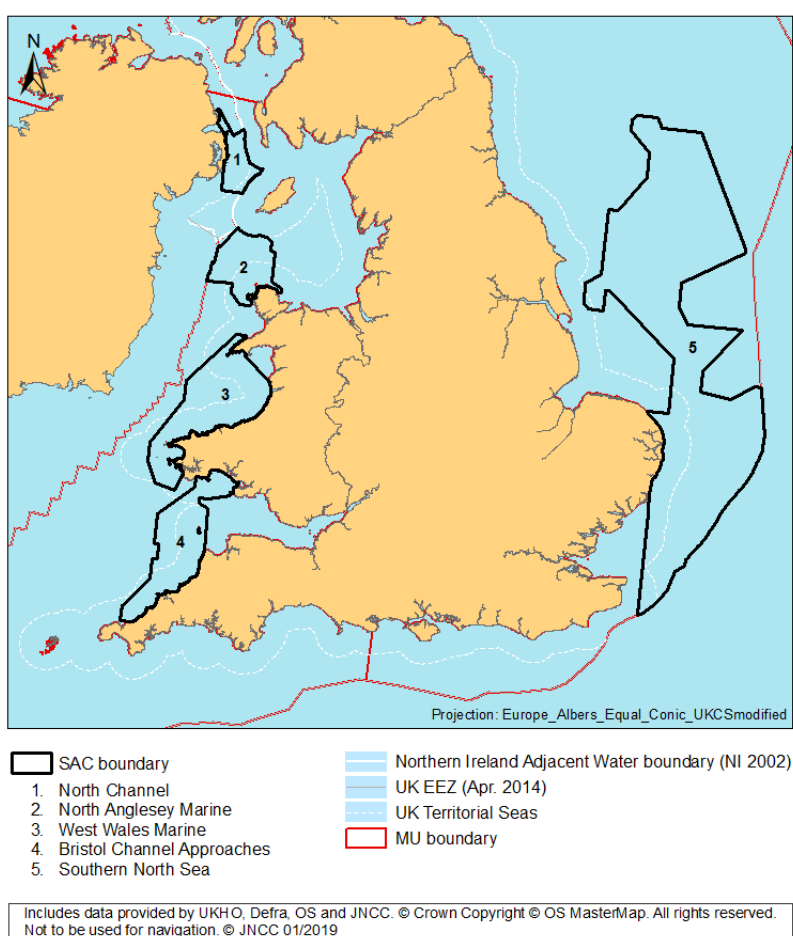


Figure 1: Special Areas of Conservation for the harbour porpoise, *Phocoena phocoena* identified in Northern Ireland, England, Wales and offshore waters. The Management Unit (MU) boundary (red line) refers to the UK portion of the North Sea and Celtic and Irish Seas MUs.

⁴ For conservation and management purposes it is practical to divide the population into smaller units, termed Management Units (MUs). These MUs were developed to take account of biological populations of animals but were also be determined by political boundaries and are at an appropriate scale at which to assess human activities. In the UK, three MUs have been defined for harbour porpoise: West of Scotland, Celtic and Irish Seas, and North Sea (IAMMWG, 2015)

This advice document is for the Southern North Sea SAC (Figure 2) which is subject to protection under the Conservation of Habitats and Species Regulations 2017⁵ and the Conservation of Offshore Marine Habitats and Species Regulation 2017⁶ (collectively referred to as the Habitats Regulations). The advice is given in fulfilment of the duty of the Statutory Nature Conservation Bodies (SNCBs) under the Habitats Regulations to advise Relevant and Competent Authorities as to (a) the Conservation Objectives for the site; and (b) any operations which may cause deterioration of natural habitats or the habitats of species, or disturbance of species, for which the site has been designated. The SNCBs aim to ensure that the Conservation Objectives are up-to-date, accessible and enable the assessment of the potential effects of plans and projects.

2 Responsibilities of Relevant and Competent Authorities

Competent Authorities (including those which are also Relevant Authorities) are required to exercise their functions to comply with the Habitats Regulations. Competent Authorities must, within their areas of jurisdiction, consider both direct and indirect effects on the site. This includes considering operations inside and outside the boundary of the SAC, if the impacts could affect the achievement of the site's Conservation Objectives. Decisions on management measures (e.g. the scale and type of mitigation) are the responsibility of the relevant regulatory or management bodies. These bodies will consider SNCB advice and hold discussions with the sector concerned, where appropriate. Where consent is required and the operation (if considered a plan or project) is likely to significantly affect a European Site, Article 6(3) of the Habitats Directive requires that an Appropriate Assessment (AA) is carried out. The AA is part of the "Habitat Regulations Assessment" (HRA), which is a case-specific assessment made in view of the Conservation Objectives for the affected site or sites. Each HRA requires case-specific advice from the SNCB but the assessment is the responsibility of the competent authority concerned.

The variability of harbour porpoise distribution and abundance within sites is in part due to their mobility and wide-ranging nature as well as natural and anthropogenic changes in habitat and prey. Relevant and Competent Authorities are not required to undertake any actions to ameliorate changes in the condition of the site if it is shown that the changes result wholly from natural causes. It is therefore important to contextualise any apparent deterioration of harbour porpoise presence in the site in terms of natural variability and the abundance and distribution patterns at the population level (i.e. MU).

3 Conservation Objectives for harbour porpoise SACs

3.1 The role of Conservation Objectives

Site level Conservation Objectives are a set of specified objectives that must be met to ensure that the site contributes in the best possible way to achieving Favourable Conservation Status (FCS) of the designated site feature(s) at the national and biogeographic level (EC, 2012). Conservation Objectives constitute a necessary reference for:

- identifying any site-based conservation measures that may be required;
- carrying out HRAs of the implications of plans or projects.

The purpose of the HRA is to determine whether a plan or project adversely affects a site's integrity. The critical consideration in relation to site integrity is not the extent or degree of an

⁵ <http://www.legislation.gov.uk/uksi/2017/1012/contents/made>

⁶ <http://www.legislation.gov.uk/uksi/2017/1013/contents/made>

impact, or whether an impact is direct or indirect, but whether a plan or project, either individually or in combination with other plans or projects, affects the site's ability to achieve its Conservation Objectives and therefore contribute to Favourable Conservation Status.

Harbour porpoise are protected everywhere in European waters under the provisions of the Habitats Regulations. The harbour porpoise in UK waters are considered part of a wider European population and the highly mobile nature of this species means that the concept of a 'site population' is not considered an appropriate basis for expressing Conservation Objectives for this species. Site based conservation measures will complement wider ranging measures that are in place for the harbour porpoise.

3.2 Background to Conservation Objectives

The Conservation Objectives are designed to help ensure that the obligations of the Habitats Directive can be met. Article 6(2) of the Directive requires that there should be no deterioration or significant disturbance of the qualifying species or to the habitats upon which they rely. Therefore, the focus of the Conservation Objectives for harbour porpoise sites is on addressing pressures that affect site integrity and would include:

- killing or injuring harbour porpoise (directly or indirectly);
- preventing their use of significant parts of the site (disturbance / displacement);
- significantly damaging relevant habitats; or
- significantly reducing the availability of prey.

This document includes both a statement of the Conservation Objectives and explanatory text on their intent and interpretation specific to the site. The Conservation Objectives have been set taking account of European Commission guidance (EC, 2012). Further guidance on the management of specific pressures of harbour porpoise is being developed.

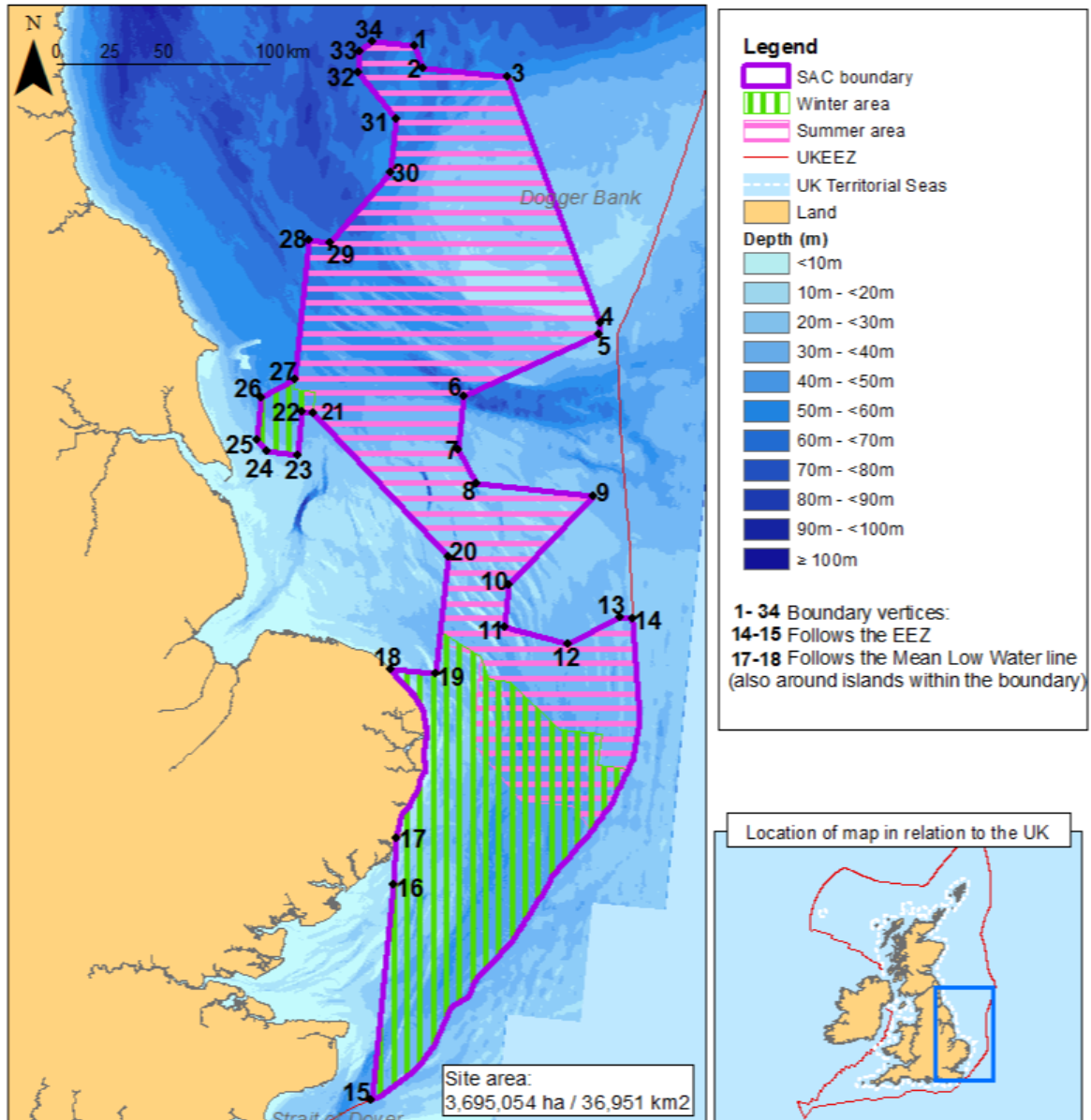
3.3 The Southern North Sea SAC Conservation Objectives

The qualifying feature of the site is the Habitats Directive Annex II species:

- harbour porpoise (*Phocoena phocoena*)

Seasonal differences in the relative use of the site have been identified based on the analyses of Heinänen and Skov (2015). Harbour porpoise sightings data were modelled seasonally (Summer: April-September and Winter: October-March) for each MU. The outputs of this analysis were maps of areas by season and MU, that persistently contained elevated densities of harbour porpoises. These areas were used as the basis for site identification and as a consequence, sites may have seasonal components which should be considered in the assessment of impacts and proposed management. The Southern North Sea has been designated because of its importance to harbour porpoise in both the summer and winter months (Figure 2).

Southern North Sea



Includes data provided by UKHO, Defra, OS and JNCC. © Crown Copyright © OS MasterMap. All rights reserved.
 Not to be used for navigation. © JNCC 02/2019. Coordinates displayed in WGS84 geographic coordinate system.
 Site area calculated using modified Europe_Albers_Equal_Area_Conic_UK projection.

ID	Latitude	Longitude	ID	Latitude	Longitude	ID	Latitude	Longitude	ID	Latitude	Longitude
1	55° 28' 53.1" N	01° 02' 24.8" E	10	53° 17' 32.9" N	02° 11' 31.6" E	19	52° 53' 06.4" N	01° 45' 21.9" E	28	54° 37' 0.5" N	00° 27' 44.8" E
2	55° 23' 34.2" N	01° 07' 24.8" E	11	53° 06' 45.7" N	02° 11' 43.8" E	20	53° 22' 42.4" N	01° 44' 22.2" E	29	54° 37' 11.8" N	00° 37' 01.8" E
3	55° 24' 03.2" N	01° 45' 17.6" E	12	53° 04' 11.8" N	02° 38' 38.6" E	21	53° 54' 05.6" N	00° 39' 29.7" E	30	54° 56' 28.6" N	00° 59' 18.7" E
4	54° 25' 05.4" N	02° 37' 56.9" E	13	53° 12' 19.1" N	02° 59' 22.3" E	22	53° 54' 0.3" N	00° 35' 04.2" E	31	55° 09' 56.9" N	00° 58' 38.1" E
5	54° 22' 23.6" N	02° 37' 58.3" E	14	53° 12' 19.0" N	03° 04' 57.1" E	23	53° 43' 17.2" N	00° 35' 41.1" E	32	55° 20' 23.2" N	00° 39' 10.7" E
6	54° 03' 07.5" N	01° 43' 06.7" E	15	51° 04' 38.9" N	01° 39' 44.1" E	24	53° 42' 60.0" N	00° 22' 03.6" E	33	55° 25' 46.4" N	00° 38' 51.5" E
7	53° 49' 40.4" N	01° 43' 32.5" E	16	51° 59' 04.9" N	01° 38' 08.0" E	25	53° 45' 35.5" N	00° 17' 20.7" E	34	55° 28' 33.4" N	00° 43' 26.4" E
8	53° 41' 38.9" N	01° 52' 54.2" E	17	52° 10' 54.3" N	01° 37' 11.0" E	26	53° 56' 22.0" N	00° 16' 38.8" E			
9	53° 41' 57.7" N	02° 42' 50.7" E	18	52° 52' 51.4" N	01° 26' 06.8" E	27	54° 02' 03.1" N	00° 30' 01.3" E			

Figure 2: The Southern North Sea Special Area of Conservation for harbour porpoise. Summer and winter areas shown.

The Conservation Objectives for the site are:

To ensure that the integrity of the site is maintained and that it makes the best possible contribution to maintaining Favourable Conservation Status (FCS) for Harbour Porpoise in UK waters

In the context of natural change, this will be achieved by ensuring that:

1. Harbour porpoise is a viable component of the site;
2. There is no significant disturbance of the species; and
3. The condition of supporting habitats and processes, and the availability of prey is maintained.

Conservation Objective 1: Harbour porpoise is a viable component of the site

This SAC has been selected primarily based on the long-term, relatively higher densities of porpoise in contrast to other areas of the MU. The implication is that the SAC provides relatively good foraging habitat and may also be used for breeding and calving. However, because the number of harbour porpoise using the site naturally varies (e.g. between seasons), there is no exact value for the number of animals expected within the site.

The intent of this objective is to minimise the risk of injury and killing or other factors that could restrict the survivability and reproductive potential of harbour porpoise using the site. Specifically, this objective is primarily concerned with operations that would result in unacceptable levels of those impacts on harbour porpoises using the site. Unacceptable levels can be defined as those having an impact on the FCS of the populations of the species in their natural range. The reference population for assessments against this objective is the MU population in which the SAC is situated (IAMMWG 2015).

Harbour porpoise is a European Protected Species (EPS) listed on Annex IV of the Habitats Directive and as such is protected under the Habitats Directive Article 12 and transposing regulations from deliberate killing (or injury), capture and disturbance throughout its range. In addition, Article 12 (4) of the Habitats Directive is concerned with incidental capture and killing. It states that Member States 'shall establish a system to monitor the incidental capture and killing of the species listed on Annex IV (all cetaceans). In the light of the information gathered, Member States shall take further research or conservation measures as required to ensure that incidental capture and killing does not have a significant negative impact on the species concerned'. Site based measures should therefore be aligned with the existing strict protection measures in place throughout UK waters. Significant disturbance within or affecting the site is considered in the second conservation objective.

Conservation Objective 2: There is no significant disturbance of the species

Disturbance of harbour porpoise typically, but not exclusively, originates from operations that cause underwater noise including, as examples, seismic surveys, pile driving and sonar. Responses to noise can be physiological and/or behavioural. JNCC has produced guidelines to minimise the risk of physical injury to cetaceans from various sources of loud, underwater noise⁷. However, disturbance is primarily a behavioural response to noise and may, for example, lead to harbour porpoises being displaced from the affected area.

This SAC was identified as having persistently higher densities of harbour porpoises (Heinänen and Skov 2015) compared to other areas of the MU. This is likely linked to the habitats within the site providing good feeding opportunities. Therefore, operations within or affecting the site should be managed to ensure that the animals' potential usage of the site is

⁷ <http://jncc.defra.gov.uk/page-4273>

maintained. Disturbance is considered significant if it leads to the exclusion of harbour porpoise from a significant portion of the site. Specifically, draft SNCB advice / guidance for assessing the significance of noise disturbance to a site suggests:

Noise disturbance within an SAC from a plan/project individually or in combination is significant if it excludes harbour porpoises from more than:

1. 20% of the relevant area⁸ of the site in any given day⁹, and
2. an average of 10% of the relevant area of the site over a season^{10,11}.

Conservation Objective 3: The condition of supporting habitats and processes, and the availability of prey is maintained

Supporting habitats, in this context, means the characteristics of the seabed and water column. Processes encompass the movements and physical properties of the habitat. The maintenance of supporting habitats and processes contributes to ensuring that prey is maintained within the site and is available to harbour porpoises using the site. Some evidence shows that the harbour porpoise has a high metabolic rate compared to terrestrial mammals of similar size (Rojano-Doñate et al. 2018) and high feeding rates (Wisniewska et al., 2016). The harbour porpoise is therefore thought to be a species that is highly dependent on year-round proximity to food sources and its distribution and condition may strongly reflect the availability and energy density of its prey (Brodie 1995 in Santos & Pierce, 2003). The densities of porpoise using a site are likely linked to the availability (and density) of prey within the site. Harbour porpoise eat a variety of prey including gobies, sandeel, whiting, herring and sprat. However, the diet of porpoises when within the sites is not well known but is likely comparable to that in the wider seas.

There are several operations (Table 2) which potentially affect the achievement of this Conservation Objective. Whilst some plans/projects are unlikely to have a significant effect alone, an effect might become significant when considered in combination with other plans/projects and against the background of existing activities/pressures on the site. Further work is needed to assess historic, existing and planned levels of plans/projects in the sites and to better understand their impacts on the habitats and prey within the sites.

4 Advice on Operations

4.1 Purpose of advice

This section details the advice on activities specifically occurring within or close to the Southern North Sea SAC that would be expected to impact the site; this is known as Advice on Operations. Initial assessments were conducted at a UK scale, with subsequent site-level assessment detailing our understanding of the operations and their potential to impact the site (Section 5 & 6). Advice is only given where pressures¹² may impact the site and

⁸ The relevant area is defined as that part of the SAC that was designated on the basis of higher persistent densities for that season (summer defined as April to September inclusive, winter as October to March inclusive).

⁹ Applicable only in Habitats Regulations Assessments (HRA) due to impracticality of daily noise limit management of activities, but retrospective compliance analysis advised

¹⁰ Summer defined as April to September inclusive, winter as October to March inclusive

¹¹ For example, a daily footprint of 19% for 95 days would result in an average of $19 \times 95 / 183$ days (summer) = 9.86%

¹² See Annex B for definition of key terms

therefore, may require management, if the Conservation Objectives are to be met. Widespread pressures may also act to affect the overall status of harbour porpoise, but their effects are not restricted to specific sites. Such pressures are best dealt with through broader measures. Alongside and in addition to the identification of the network of harbour porpoise sites, an overarching conservation strategy (DETR, 2000) has been in place for harbour porpoise since 2000. In light of a recent conservation literature review (IAMMWG *et al* 2015), a UK Dolphin and Porpoise Conservation Strategy is being developed.

The advice outlined below should also be used to help identify the extent to which existing operations are, or can be made, consistent with the Conservation Objectives, and thereby focus the attention of Relevant and Competent Authorities and monitoring programmes to areas that may need management measures.

This Advice on Operations will be supplemented through further discussions with the Relevant and Competent Authorities and any advisory groups that may be formed for the site.

4.2 Background

In compiling this Advice on Operations, the SNCBs have considered the pressures that may be caused by human activities and may affect the integrity of the site when considered against the Conservation Objectives. The advice is generated through a broad grading of sensitivity and exposure of the harbour porpoise to pressures associated with activities to gain an understanding of how vulnerable the species is to each activity at a UK level. The activities and their associated pressures to which the harbour porpoise is deemed vulnerable at a UK level are then considered at a site level to inform the risks to achieving the Conservation Objectives along with any potential management that may be required to mitigate against such risks. Annex A details the assessments of the level of impact risk¹³ from operations on harbour porpoise populations at a UK-wide scale. This informs on the activities likely to impact the site.

This document is guidance only and activities and their management within or affecting the site will be considered in the context of HRA and where applicable through other environmental assessment processes, such as Environmental Impact Assessment (EIA).

5 Operation assessments at UK scale

The assessments have been carried out using all available evidence as of February 2019. If further information is made available in future which would improve our understanding of harbour porpoise vulnerability in UK waters, the assessments may be updated. This advice is provided without prejudice for use by the Relevant and Competent Authorities. The level of any impact will depend on the location, timing and intensity of the relevant operation. This advice is provided to assist and focus the Relevant and Competent Authorities in their consideration of the management of these operations.

The harbour porpoise is a wide-ranging species and occurs throughout the UK Continental Shelf area (JNCC, 2013). It does occur in deeper waters but in very low densities, and perhaps only seasonally. As a predominantly continental shelf species, it is exposed to a wide range of pressures that are both ubiquitous (e.g. pollution) and patchy (e.g. bycatch) in nature, and the list of anthropogenic activities leading to these pressures is long. Based on current available information, the operations that pose the most notable risk of impact to UK harbour porpoise are shown in Table 1.

¹³ Risk includes consideration of severity of implications of impact

The current levels of impact of the various pressures are based on the Article 17 assessments¹⁴ and the full list of assessed activities and key references can be found in Annex A. Updates to the assessments will occur as more evidence becomes available.

Definitions of pressures are explained in Annex B.

Activities which currently pose a low risk to harbour porpoise at the UK level (Annex A) have not been considered in this advice. The exposure to the pressures associated with these activities is currently very limited. Non-anthropogenic impacts are also not considered, such as attack and predation from other marine mammal species that have the potential to impact harbour porpoise populations.

Table 1: Key activities (operations) and the relative risk of impacts on harbour porpoise throughout UK waters. Those pressures ranked 'high' are known to have the greatest impact relative to other pressures on the population of UK harbour porpoises. Activities which currently pose a low risk are not shown.

Operations	Pressures	Impacts	Current relative level of risk of impact
Commercial fisheries with bycatch of harbour porpoise (predominantly static nets)	Removal of non-target species	<ul style="list-style-type: none"> • Mortality through entanglement/bycatch 	High
Discharge/run-off from land-fill, terrestrial and offshore industries	Contaminants	<ul style="list-style-type: none"> • Effects on water and prey quality • Bioaccumulation through contaminated prey ingestion Leading to health issues (e.g. on reproduction) 	High
Shipping, drilling, dredging and disposal, aggregate extraction, pile driving, acoustic surveys, underwater explosion, military activity, acoustic deterrent devices and recreational boating activity	Anthropogenic underwater sound	<ul style="list-style-type: none"> • Mortality • Internal injury • Disturbance leading to physical and acoustic behavioural changes (potentially impacting foraging, navigation, breeding, socialising) • Habitat changes/loss 	Medium
Shipping, recreational boating, tidal energy installations	Death or injury by collision	<ul style="list-style-type: none"> • Mortality • Injury 	Medium/Low
Commercial fisheries (reduction in prey resources)	Removal of target species	<ul style="list-style-type: none"> • Reduction in food availability • Increased competition from other species • Displacement from natural range 	Medium

¹⁴ EU Habitats Directive Article 17 assessment, harbour porpoise report: http://jncc.defra.gov.uk/pdf/Article17Consult_20131010/S1351_UK.pdf . Updated Article 17 reports for 2013-2018 will be available in 2019.

6 Site specific considerations: Southern North Sea SAC

6.1 Sensitivity of harbour porpoise to existing activities within or impacting the site

The Southern North Sea site spans territorial and offshore waters and covers a large geographical area of 36,951km². A summary of the site can be found in the Selection Assessment Document on the Site Information Centre¹⁵.

All available information on activities within the site has been used to assess the threats and pressures within the site. However, precise information on some activities within the boundary is not currently available due to lack of targeted data collection to date. Assessing exposure carries certain assumptions about the spatial extent, frequency and intensity of the pressures associated with marine activities.

Table 2 is an overview of activities (operations) occurring within or in proximity to the Southern North Sea site to which the harbour porpoise has a current relative level of risk of impact as High or Medium at a UK level (Table 1) and therefore may require further consideration concerning options for management. The impact of a pressure at the site level can differ to that at UK level dependent on the amount of activity within or adjacent to the site. GIS layers of spatial activity data as well as review of literature, were used to identify the impact risk within the site (where a pressure is concentrated within a site) and whether it differs from the UK level risk. These assessments include all available information as of February 2019.

In 2012, the UK Government adopted a revised approach to the management of fishing activities within European marine sites (EMS) in England¹⁶. The revised approach is designed to ensure consistency in the management of fishing activities with Article 6 of the Habitats Directive. Risk based prioritisation of managing the fishing activities of UK and non-UK vessels has been applied to relevant SAC features within the UK 12 nautical mile (nm) territorial limit. For SACs outside of 12 nm, management measures will be introduced by appropriate regulators to ensure adequate protection.

JNCC and the country SNCBs are working with the Regulators and Industry to ensure that a pragmatic approach to mitigation and management of pressures that may affect the integrity of the site is adopted. Any future guidance documents will be made available on the Site Information Centre on the JNCC website.

¹⁵ SAC Selection Assessment Document: <http://jncc.defra.gov.uk/page-7243>

¹⁶ <https://www.gov.uk/government/publications/revised-approach-to-the-management-of-commercial-fisheries-in-european-marine-sites-overarching-policy-and-delivery>

Table 2: Operations occurring within/near to the Southern North Sea site which may affect the integrity of the site.

Operations	Pressure	Comment on current level of activity	Management considerations
Commercial fisheries (with harbour porpoise bycatch)	Removal of non-target (bycatch) species	<p>Bycatch of harbour porpoise in fishing gear is one of the most significant anthropogenic pressures impacting the population at a UK level. The commercial fisheries most associated with harbour porpoise bycatch are bottom set nets, such as gillnets and tangle nets.</p> <p>The Fishery Activity Database (Marine Management Organisation) shows that fishing effort is higher along the coast. There are pockets of higher bycatch rates in areas close to the site boundary, particularly in areas off the coast from Flamborough Head, although the use of static and drift nets is higher in the southern regions of the site.</p> <p>VMS data from large vessels suggest there is higher static net effort from EU registered vessels compared to UK vessels in the offshore region of the SAC. Effort in the south east appears to have increased between 2009 and 2013.</p>	<p>Where bycatch may pose a risk to achieving the site's conservation objectives, mitigation may be required.</p> <p>Where management measures are required, the development of these would be led by fishery managers in discussion with fishing interests and informed by any detailed information about fishing activity that can be made available. Detailed measures, if required, will be developed by the relevant management authority (European Commission/MMO/IFCA/Defra)</p> <p>The use of pingers as a mitigation measure is required on static nets deployed by vessels >12 m in length in specified areas through EU Regulation 812/2004¹⁷. This part of the UK fleet currently utilises the DDD pinger, which has been agreed under derogation. Additional noise disturbance may need to be considered if acoustic deterrent devices are considered to be used as mitigation. A fisheries guidance document will be developed in collaboration with management authorities and stakeholders.</p> <p>The majority of bycatch is taken by the numerous small bottom set gillnetting vessels (<12m), for which the use of pingers is not mandatory under Regulation 812/2004. One option for management could be to extend the pinger requirement to include any vessels. Further work is needed to understand the scale of disturbance that could result from the wide-spread deployment of pingers on all vessels operating within the site. If necessary, consideration of alternatives to pinger use could be explored and might include gear modification or alternative gear types.</p>

¹⁷ <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2004:150:0012:0031:EN:PDF>

<p>Discharge/run-off from land-fill, terrestrial/offshore industries</p>	<p>Contaminants</p>	<p>Current exposure within/near the site is unknown.</p>	<p>This pressure cannot be managed effectively at the site level. Most of the relevant pollutants have been effectively phased out of use by action under the OSPAR Convention and the Stockholm convention, which restrict the marketing and use of PCBs; plan for disposal of PCBs; and eliminate or restrict the production and use of persistent organic pollutants [POPs]). However, human activities are the most likely cause of the re-release of these chemically stable chemicals into the environment or for introduction of other contaminants of which the impacts are poorly known.</p> <p>Any novel sources of potential contamination and/or activities likely to cause re-release of pollutants from stores associated with a new plan or project will be assessed under HRA both within and outside the site where there is the potential to impact upon site integrity.</p> <p>Current sources of exposure have to be identified and further efforts to limit or eliminate PCB discharges to the marine environment may still be needed.</p>
<p>Shipping</p>	<p>Anthropogenic underwater sound</p>	<p>Several ports along the east coast of England result in large vessel shipping routes throughout the site. There is higher pressure along the southern boundary of the site, although development is ongoing in the Humber to increase port capacity.</p> <p>An estimated increase in local vessel traffic associated with wind farms is expected at 25% during construction and 20% during operation.</p>	<p>Harbour porpoise use sound for foraging, navigation, communication and predator detection. Underwater noise therefore has the potential to interrupt or affect these behaviours as well as cause hearing damage, particularly at short distances. The peak frequency of echolocation pulses produced by harbour porpoise is 120–130 kHz, corresponding to their peak hearing sensitivity although hearing occurs throughout the range of ~1 and 180 kHz (Southall <i>et al</i> 2007).</p> <p>The underwater sounds created by large ships are unlikely to cause physical trauma but could make preferred habitats less attractive as a result of disturbance (habitat displacement, area avoidance). However, additional management is unlikely to be required based on current levels within the site. Significant increases in vessel traffic, for example as may be associated with the installation of wind farms in</p>

			the area, would need further assessment.
Oil and gas drilling		Areas licensed for oil and gas extraction are present in the northern and central parts of the site.	Existing and inactive (exploratory and dry) wells and oil and gas licensed blocks occur within the network of harbour porpoise sites and any future applications would be subject to an HRA.
Pile driving		Current and licensed areas for offshore wind, including construction and maintenance phases are located within the site.	<p>A European Protected Species (EPS) licence is required for any construction activity which could affect cetaceans and carries the risk of resulting in a disturbance or injury offence. Developers are required to follow the 'Statutory Nature Conservation Agency protocol for minimising the risk of injury to marine mammals from piling noise'¹⁸.</p> <p>An HRA will be considered for all new (or review of consent) developments (coastal and marine) using pile driving within the site or within 26km of site boundaries. If additional mitigation (to that required under EPS licence) is required, planning and management of pile driving activities may be needed. There is potential for a reduction or limitation of the disturbance / displacement effects by varying the schedule of piling, particularly if several developments are constructing at the same time and pile driving footprints do not overlap (which would maximise area from which porpoise are excluded). Limited spatio-temporal restrictions may be needed.</p> <p>Other examples of mitigation that might be required include the use of sound dampers, i.e. methods that create a barrier to sound transfer (e.g. bubble curtains) and the use of alternative foundation types (e.g. gravity foundations, suction cups, floating turbines, drilling).</p>
Dredging and disposal		A number of capital and maintenance dredging and disposal sites are present within the site boundary.	Dredging and disposal can cause disturbance leading to changes in harbour porpoise behaviour as well as to their habitat and prey. There is also potential for resuspension of pollutants from the sediment. The risk from single plans/projects may be considered relatively low but is assessed through HRA. However,

¹⁸ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/50006/jncc-pprotocol.pdf

		<p>there is currently considerable uncertainty regarding effects on habitat and prey.</p> <p>New dredging projects (or licence renewals) are subject to HRA. Cumulative impacts will be considered within the HRA.</p>
Aggregate extraction	Extensive existing licensed and active areas within the site.	<p>Aggregate extraction can cause disturbance leading to changes to harbour porpoise behaviour as well as to their habitat and prey. However, the risk is considered relatively low and additional management is unlikely to be required.</p> <p>New aggregate extraction projects (or licence renewals) are subject to HRA. Cumulative impacts will be considered within the HRA.</p>
Geophysical surveys (including seismic) surveys	Geophysical surveys occur in the site.	<p>Some geophysical surveys that may affect the integrity of the site may require consent and be subject to HRA.</p> <p>Each case needs to be assessed individually, and the JNCC Guidelines for minimising the risk of injury to marine mammals from geophysical surveys (updated August 2017¹⁹) are available online. Within the guidance, seismic survey is defined as <i>'Any geophysical survey that uses airguns to generate sound which is sent into the seabed and the reflected energy is recorded and processed to produce images of the geological strata below; described as 2D, 3D and 4D and includes any similar techniques that use airguns.'</i></p> <p>It is currently not known whether sub-bottom profilers cause disturbance to harbour porpoise. Further research is needed to understand the sound propagation and effect ranges from these types of equipment.</p> <p>Cumulative impacts of geophysical surveys will need to be considered.</p> <p>Further advice on assessment and management of noisy activities within the sites is being developed by the SNCBs in consultation with Regulators, industry and NGOs.</p>

¹⁹ http://jncc.defra.gov.uk/pdf/jncc_guidelines_seismicsurvey_apr2017.pdf.

Acoustic deterrent/mitigation devices		Unknown, no consistent areas of usage but can be used as a mitigation tool during pile driving and unexploded ordnance (UXO) detonations.	See pile driving and UXOs.
Pinger devices		23 UK registered >12 m gillnet boats of which four are required to use pingers in the area of the site to meet the requirements of Reg812/2004. Use on vessels under 12 m within the site is unknown but likely low.	See 'Fisheries (commercial and recreational) with harbour porpoise bycatch'. The use of pingers is required for >12m gillnet sector and there are 4 vessels fishing within the site that are required to use pingers. Because the majority of the total bycatch occurs in bottom set nets deployed from vessels <12m, which are the greatest component of the UK gillnet fleet, one option for management could be to extend the pinger requirement to further vessels deploying static nets within site boundaries. However, the impact of potential disturbance as a result of such an approach may need to be assessed and the potential for other mitigation options such as alternative gear types, gear modifications or spatial gear restriction may need to be considered.
Military activity		Although few active MOD areas are located within the site, the MOD can operate anywhere in UK waters.	Activities take place under Range Standing Orders, command guidance and environmental risk management tools, which include measures to reduce the risk of killing, injury and disturbance of marine mammals (for example live firing trials are subject to confirmation that marine mammals are not present in the vicinity of targets). MOD, a Competent Authority, incorporates the SACs into their environmental assessments via their MOD Environmental Protection Guidelines (Maritime) and Marine Environment and Sustainability Assessment Tool (MESAT) ²⁰ .
Unexploded ordnance (UXOs)		Unexploded ordnance from WWII can be found throughout the North Sea, including within the site. Projects that could inadvertently explode	Although the removal of UXOs is short term, the noise is significant and can cause injury or death to harbour porpoise. An EPS licence and/or HRA may be required. Mitigation is usually required to reduce risk of injury and killing. As a minimum, the JNCC

²⁰ <http://www.royalnavy.mod.uk/-/media/royal-navy-responsive/documents/useful-resources/environmental-protection/environmental-protection-guidelines-maritime-v21.pdf?la=en-gb>

		UXOs must undertake a survey to search for possible ordnance ahead of the project commencing. Most ordnance found is exploded on site or removed for health and safety reasons.	<p>guidelines for minimising the risk of disturbance and injury to marine mammals whilst using explosives are applied. A combination of Marine Mammal Observers (MMO)s, Acoustic Deterrent Devices (ADD) and occasionally scare charges are used to ensure harbour porpoise and other marine mammals are a sufficient distance from the explosion to prevent death or injury. Discussions are ongoing between industry, regulators and SNCBs on the most appropriate suite of mitigation measures for UXO clearance (including the possible use of bubble curtains). This will depend on the size of UXOs likely to be encountered and the practicality of deployment of the mitigation measure, amongst other factors.</p> <p>Discussions are ongoing between industry, regulators and SNCBs on the most appropriate suite of mitigation measures for UXO clearance (including the possible use of bubble curtains). This will depend on the size of UXOs likely to be encountered and the practicality of deployment of the mitigation measure, amongst other factors.</p>
Shipping	Death or injury by collision	Several ports along the east coast of England resulting in busy shipping routes throughout the site, with the highest level of activity in the south.	Post mortem investigations of stranded harbour porpoise (Deaville & Jepson, 2011; Deaville 2011:2017) have revealed some deaths caused by trauma (potentially linked with vessel strikes). However, this is not currently considered a significant risk and no additional management is likely to be required.
Recreational boating activity		Royal Yachting Association (RYA) cruising routes are present across the extent of the site, although focussed along the coast	<p>See 'Shipping' (with death or injury by collision).</p> <p>Adherence to wildlife codes of conduct is already advocated, e.g: WiSe scheme; SeaWatch code of conduct; ZSL code of conduct; The RYA good practice guide - The Green Wildlife Guide for Boaters</p> <p>UK SNCBs are looking at the option of developing an overarching wildlife watching code of conduct to site alongside the Scottish code.</p>
Commercial fisheries	Removal of target (prey) species	Fisheries targeting prey species such as whiting, herring, sandeel and sprat throughout their	Currently, most commercial species are managed at scales relevant for stock management and not at the site level.

		<p>ranges in the North Sea, fished by UK and EU fisheries.</p>	<p>Harbour porpoise diet within UK waters includes a wide variety of fish and they will generally focus on the most abundant local species (De Pierrepont <i>et al</i> 2005; Camphuysen <i>et al</i> 2006). The predominant prey type appears to be whiting, gobies and sandeel, although shoaling fish such as mackerel and herring are also taken. Harbour porpoise diets overlap extensively with diets of other piscivorous marine predators (notably seals) and many of the main prey species are also taken by commercial fisheries, although porpoises tend to take smaller fish than those targeted by fisheries (Santos and Pierce 2003).</p> <p>The overlap between commercial fisheries and harbour porpoise prey is unknown within the site. Further research is required to establish whether there is any direct overlap.</p>
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6.2 Limitations of the evidence

It is important to note that the information used to catalogue activities occurring within the site is not complete. The available data are drawn from existing monitoring programmes (e.g. the UK's Bycatch Monitoring Scheme for Protected Species and other European datasets linked to VMS monitoring of fishing vessels) but these have limitations, including availability and accessibility of data at the time of preparing this advice. Caveats with how the data have been collected also need to be understood to correctly interpret the information. This has resulted in the use of expert judgement where sufficient evidence is lacking but risk is implied. Below are some points to consider alongside the above table to ensure the information is not taken out of context:

- **Data availability**
 - Globally, the marine environment is generally far behind the evidence levels of that on land, particularly in offshore areas, mainly due to scale and difficulty/cost of data acquisition.
 - There can be sensitivities surrounding data that have been gathered by industry, and some data are not available for use for advice and management purposes. Often these data become available eventually, but not in time to inform management decisions.
- **Fishing: Limitations of fishing Vessel Monitoring System (VMS) data**
 - VMS positional data are transmitted at approximately 2-hour intervals. There is no information transmitted regarding precise vessel activity, therefore assumptions on its activity, based on logbook returns and vessel speed profile are often made.
 - Vessel positional data (e.g. VMS) cannot inform regulators regarding extent of static gear deployment or soak times.
 - Fishing vessels under 12m long, (and from 2009 until 2013, vessels under 15m long) are not required to use the VMS, and therefore VMS data tells us nothing

regarding the activity of this segment of the fleet. However, local information can be obtained from fisheries management authorities and will be used to develop more detailed guidance to assist with identification of any management measures where considered necessary.

- **Contaminants**

- Although use of many of the relevant substances (e.g. PCBs) has been heavily regulated for many years, including a ban on further production, re-suspension or reintroduction of pollutants may occur. It is difficult to identify sources of contamination when dealing with highly mobile species.

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8 Annex A: Assessment of the level of impact risk from operations (activities) on UK harbour porpoise populations

The relative level of risk of impact to harbour porpoise from a range of pressures was assessed at UK level (Table A1) as part of the 3rd reporting round for Article 17²¹. See Annex B for the definitions of pressures as used for the harbour porpoise assessments. For the assessment the relative importance of the pressure was assessed by considering the evidence available of an impact and the nature of that impact (direct/indirect) together with the area over which the pressure is acting in UK waters in relation to the species distribution. The relative levels are assigned according to the Article 17 guidance (Evans and Marvela, 2013) as:

Code	Meaning	Comment
H	High importance/impact	Important direct or immediate influence and/or acting over large areas
M	Medium importance/impact	Medium direct or immediate influence, mainly indirect influence and/or acting over moderate part of the area/acting only regionally
L	Low importance/impact	Low direct or immediate influence, indirect influence and/or active over small part of the area/acting only regionally

Table A1: Full assessment of relative level of the impact risk from operations (activities) on harbour porpoise in UK waters based on considerations for Article 17 assessment for harbour porpoise conservation status²².

Operations	Pressures ²³	Impacts	Relative level of risk of impact	Evidence		Key references
				Spatial overlap (species & pressure)	Post-mortem examination	
Commercial fisheries with bycatch (predominantly static nets)	Removal of non-target species	<ul style="list-style-type: none"> Mortality through entanglement/by catch 	High	✓	✓	Deaville and Jepson, 2011; Morizur <i>et al</i> 1999; Read <i>et al</i> 2006; Northridge, S. and Kingston, A. 2010; Northridge <i>et al</i> 2016; ICES 2015b

²¹ <http://jncc.defra.gov.uk/page-6564>

²² EU Habitats Directive Article 17 assessment, harbour porpoise report: http://jncc.defra.gov.uk/pdf/Article17Consult_20131010/S1351_UK.pdf

²³ The NE Advice on Operations also has a 'Radionuclide' pressure category assessed as being insufficient in evidence. This would likely be a 'low' in terms of impact risk and as such is unlikely to pose a significant threat to maintenance of harbour porpoise FCS

Discharge/run-off from land-fill, terrestrial and offshore industries	Contaminants ²⁴	<ul style="list-style-type: none"> • Effects on water and prey quality • Bioaccumulation through contaminated prey ingestion • Health issues (e.g. on reproduction) 	High		✓	Jepson <i>et al</i> 2005; Jepson <i>et al</i> 2016; Deaville & Jepson, 2011; ICES, 2015a; Van De Vijver <i>et al</i> 2003; Law <i>et al</i> 2012; Pierce <i>et al</i> 2008; Murphy <i>et al</i> 2015.
Noise ²⁵ from shipping, drilling, dredging and disposal, aggregate extraction, pile driving, acoustic surveys, underwater explosion, military activity, acoustic deterrent devices and recreational boating activity	Anthropogenic underwater sound	<ul style="list-style-type: none"> • Mortality • Internal injury • Disturbance leading to physical and acoustic behavioural changes (potentially impacting foraging, navigation, breeding, socialising) • Habitat change/loss 	Medium	✓		Deaville & Jepson, 2011; Stone & Tasker, 2006; Stone, 2015; Jepson <i>et al</i> 2005; Fernandez <i>et al</i> 2005; Würsig & Richardson, 2009; WGMME, 2012.
Shipping, recreational boating, renewable energy installations	Death or injury by collision	<ul style="list-style-type: none"> • Mortality • Injury 	Medium/Low	✓	✓	Deaville & Jepson, 2011; Dolman <i>et al</i> 2006; ICES 2015a
Commercial fisheries, bycatch	Removal of target species	<ul style="list-style-type: none"> • Reduction in food availability • Increased competition from other species • Displacement from natural range • Habitat change/loss 	Medium		✓	Simmonds and Isaac, 2007; OSPAR QSR 2010; MacLeod <i>et al</i> 2007a, b; Thompson <i>et al</i> 2007; Santos and Pierce, 2003; Pierce <i>et al</i> 2007; ICES 2015b
Agriculture, aquaculture, sewage	Nutrient enrichment	<ul style="list-style-type: none"> • Effects on water quality • Increased risk of algal blooms may present health issues • Habitat change/loss 	Low	✓	✓	Craig <i>et al</i> 2013
Agriculture, aquaculture, sewage	Organic enrichment	<ul style="list-style-type: none"> • Effects on water quality • Increased risk of algal blooms may present health issues • Habitat change/loss 	Low	✓		Craig <i>et al</i> 2013

²⁴ The NE Advice on Operations splits contaminants into 'Transition elements and organo-metals, e.g. TBT'; 'Hydrocarbon and PAHs'; and 'synthetic compounds, e.g. pesticides, antifoulants, PCBs and pharmaceuticals'. Users of this advice should be mindful of all these categories of contaminants.

²⁵ The NE Advice on Operations includes 'vibration' as a pressure but considers that the potential effects of vibration are adequately covered by consideration of the potential pressure 'Underwater Noise Changes' and refers back to this pressure. Similar considerations should be undertaken using this advice.

Waste disposal - navigational dredging (capital, maintenance)	Physical change (to another seabed type)	<ul style="list-style-type: none"> Changes in availability of prey species Habitat change/loss 	Low			
Bridges, tunnels, dams, installations, presence of vessels (shipping, recreation)	Water flow (tidal current) changes – local	<ul style="list-style-type: none"> Changes in location of prey species Displacement of harbour porpoise Habitat change/loss 	Low			
Terrestrial and at-sea 'disposal'	Litter	<ul style="list-style-type: none"> Mortality through entanglement Ingestion 	Low	✓	✓	Deaville and Jepson, 2011
Bridges, tunnels, dams, installations, presence of vessels (shipping, recreation)	Barrier to species movement	<ul style="list-style-type: none"> Habitat inaccessible Potential physiological effects Habitat change/loss 	Low	✓		WGMME., 2012; ICES 2015a
Sewage	Introduction of microbial pathogens	<ul style="list-style-type: none"> Increased risk of disease 	Low		✓	Harvell <i>et al</i> 1999; Gulland and Hall, 2007; Van Bresseem <i>et al</i> 2009

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9 Annex B: Definitions of Pressures as applied within harbour porpoise SAC Advice on Operations

Pressures	Definition in the context of harbour porpoise advice
Removal of non-target species	The removal of species not targeted by the fishery; in this case the bycatch (and probable mortality) of harbour porpoise
Contaminants	Introduced material capable of contaminating harbour porpoise, prey or habitat important to harbour porpoise, with a negative impact directly or indirectly on porpoises
Anthropogenic underwater sound	Introduced noise with the potential to cause injury, stress or disturbance to harbour porpoise
Death or injury by collision	Introduction of physical objects; mobile or immobile, that may collide with or result in potential collision of harbour porpoise resulting in injury or mortality
Removal of target species	Removal of harbour porpoise prey, resulting in increased competition amongst porpoise and other species, and/or displacement from their natural range