



Consultation Report:
Harbour porpoise SACs noise guidance
JNCC Report No. 652



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1. Overview

During February/March 2020, a consultation took place on a draft guidance document developed by three of the Statutory Nature Conservation Bodies (SNCBs), Joint Nature Conservation Committee, Natural England and Department of Agriculture, Environment and Rural Affairs, advising on noise management within harbour porpoise SACs. The Southern North Sea Regulators Working Group¹ was invited to provide their views on the guidance, request clarifications and provide any additional evidence that might be useful in informing SNCB's advice. Regulators were also encouraged to consult their stakeholders and provide a collated response. The consultation started on the 3rd February 2020 and ran until the 13th March 2020.

The SNCBs are grateful for the many comprehensive comments received during this consultation. All comments have received due consideration and refinements to the guidance have been made as a result. This report addresses the key comments provided on the evidence base supporting the guidance. It has been organised based on the main themes emerging from all responses. All comments received can be consulted in Appendix 1 and are linked to each theme by a reference number.

There was limited new evidence highlighted through the consultation and therefore the great majority of the comments were addressed in this report through clarification of points made in the background document or guidance. This included:

- A more comprehensive explanation of the ASCOBANS conservation objective, the carrying capacity concept and the choice of the 20/10% thresholds;
- A description of the evidence behind the seasonal differences in densities which justifies the seasonal approach to enhanced noise management in the SAC;
- A review of the evidence, and discussion on whether spreading noise out over a longer period of time could cause more or less of an effect than having more noise over a shorter time;
- Further advice on the distinction between the protection of site integrity and the protection of populations;
- A more detailed justification of why the SNCBs did not advise on the setting of fixed noise thresholds (such as in German waters);
- Further clarification of which activities are and are not covered by the guidance and why;
- Further detail on the choice of recommended effective deterrent ranges (EDRs).

Some of the comments led to small changes to the guidance document. These included:

- More clarity to which activities the guidance applies, added flexibility to the upper frequency limit acknowledging harbour porpoise hearing range;
- Further detail on the reasoning behind the seasonal areas;
- Added references on harbour porpoise ability to compensate for short periods of fasting;

¹ Southern North Sea Regulators Working Group members: BEIS – Energy Development and Resilience, BEIS – Offshore Petroleum Regulator for Environment and Decommissioning, DEFRA, Marine Scotland, Marine Management Organisation, Ministry of Defence, Natural Resources Wales.

- Clarified how the carrying capacity concept and the ASCOBANS objective were used to guide the definition of significant disturbance and choice of spatio-temporal thresholds;
- Revised some of the EDRs in line with further references emerging since the last version of the guidance and provided more detailed rationale for the recommended EDRs.

There were also several editorial changes made to the guidance and background documents, final versions of which were published in May 2020. The harbour porpoise SAC noise guidance will be reviewed regularly to ensure it is kept up to date with emerging evidence.

Whilst the consultation did not focus on implementation aspects, we welcome the comments provided (see Appendix 2). These will help inform future discussions of the Southern North Sea Regulators Working Group.

2. SNCBs response to key comments received

2.1. Harbour porpoise feeding rates/needs and prey availability

Comments: 19, 49, 73, 109, 111, 123

The additional papers highlighted by some stakeholders (Hoekendijk et al. 2018, Kastelein et al. 2019a,b) broadened the discussion on porpoise feeding rates, but did not dispute the fact that harbour porpoise, being a small animal with lower fat stores, will need to feed regularly and at high rate. Where the papers did differ was on their interpretation of what that high feeding rate will mean to disturbed animals, i.e. whether the porpoise would be more resilient to disturbance as it can quickly recover once the disturbance ends (Hoekendijk et al. 2018), or less resilient as failure to acquire the high levels of energy needed could have rapid and severe fitness consequences (Wisniewska et al. 2016). Kastelein et al. 2019b showed that in captive animals, 24h periods of fasting resulted in lower body condition but that animals were able to quickly compensate if given access to food. Some of these references were added to the guidance for context.

Currently there is no evidence that porpoise can readily access the food they need after a period of disturbance. JNCC have been building evidence relating to porpoise prey and commissioned two reports to evaluate the prey distribution and availability to harbour porpoise. The first of those reports modelled prey calorific content based on five potential prey species and predicted that there is no food limitation in the North Sea. However, the authors note that they cannot say how well the energy predicted correlates to the actual available energy for porpoises given the role of other marine predators and the fishing industry. The second report is due to be published in early summer 2020.

2.2. ASCOBANS conservation objective, carrying capacity and 20/10% thresholds

Comments: 5, 6, 7, 14, 19, 41, 44, 45, 46, 47, 71, 73, 74, 75, 76, 77, 79, 80, 81, 87, 109, 111, 124

There is a concern that the thresholds are arbitrary percentages, applied to areas and not weighted based on habitat quality differences within the SACs and therefore not ecologically defensible. However, nature conservation strategies often include thresholds that are not underpinned by firm evidence. For example, a 1% fixed area threshold is recommended by the European Commission in relation to what could constitute a “large decrease in habitat surface area”, when assessing Favourable Conservation Status (FCS). This was a societal choice and not underpinned by scientific evidence.

In Germany, thresholds for managing noise disturbance have also been used - maximum disturbed area of 10% of German North Sea Exclusive Economic Zone (EEZ) and maximum 1% of a SAC during May – August². These thresholds were not guided by any ecological concept or conservation objective but by what the nature conservation advisors and/or competent authorities thought reasonable, in order to allow some level of noise from wind farm installation whilst continuing to provide sufficient habitat to harbour porpoise. As explained in the background document, 1% was considered disproportionate to use in UK sites given the temporary nature in lowered habitat quality or reduced access, and the fact that there needs to be a balance between maintaining the sites’ integrity but also permitting managed levels of activity to, for example, ensure carbon reduction targets are met.

In addition, as explained in the background document the SACs were designated based on higher persistent densities than other areas despite being subject to some disturbance from industrial activities, suggesting that animals may cope with a certain level of disturbance whilst still favouring those areas. SNCB advice has therefore been not to completely eradicate noise from the sites but to limit it, considering that if the great majority of the site is kept available during the high density season, this should allow the site to contribute in the best possible way to the species’ FCS.

The background document described the reasoning behind the use of Tougaard et al. 2013 assumption that carrying capacity loss could follow on from habitat loss. As signatories to the ASCOBANS agreements, the UK has agreed to the conservation objective of restoring and/or maintaining small cetacean populations to 80% or more of carrying capacity. The ASCOBANS objective aimed to address anthropogenic pressures of which noise is one. It has since been used to, for example, set bycatch limits. The objective applies to the whole of the management unit (e.g. North Sea) equally, however, the SACs are known to have higher densities of porpoise and therefore it was deemed more precautionary by SNCBs to aim for an average 90% of site availability within the high density season, hence setting the limit of disturbed area at 10%. To allow some flexibility in relation to activities taking place without considerable prolongment, but at the same time avoiding consecutive days with large areas of the site disturbed, a daily 20% threshold has also formed part of the advice.

²https://www.ascobans.org/sites/default/files/document/AC21_Inf_3.2.2.a_German_Sound_Protection_Concept.pdf

One of the comments highlighted that 'no evidence has been presented to support the underlying assumption of this approach, i.e. that temporary displacement from an area will cause a reduction in the harbour porpoise population.' The assumption in Tougaard et al. 2013 was that *repeated* temporary displacement over time would lead to a reduction in carrying capacity which could then lead to a population decline. The fact that seismic activity has occurred in the Southern North Sea (SNS) for decades and no changes to harbour porpoise population have been detected is not evidence that there are no limits to the disturbance a population can sustain, particularly in an important area. In addition, there is uncertainty in relation to harbour porpoise population trends (see section 2.4). So, whilst there might not be firm evidence that displacement will cause a reduction in population levels, there is also no evidence that displacement or other forms of disturbance, repeated over many seasons/years in particularly important areas for harbour porpoise would not cause such reduction.

In sites such as the SNS SAC, there are plans for the construction of several offshore wind farms over the next couple of decades. During the construction phases, wind farm areas will be disturbed more or less continually during a few months, although these areas should become fully available once the installation of turbines is completed. The SNCB advice is that the implementation of the area time thresholds, associated adaptive management and monitoring, together with reporting on site condition every six years, should appropriately contribute to maintaining the sites' integrity, despite industrial activity taking place.

It is also worth reiterating point 2a of the background document, in that the avoidance of significant disturbance in the sites is additional to the protection of the wider population(s) which is covered by the European Protected Species (EPS) strict protection measures. Even if a plan or project is not predicted to have a population level impact, there could still be an adverse effect on site integrity, if the disturbance of the species within the site was not allowing the site to contribute in the 'best possible way to achieving FCS'. By keeping that disturbance to a minimum and ensuring 90% of the sites are fully available to the species, the SNCBs consider that the sites would be contributing in the best possible way to FCS. Again, robust monitoring will be essential in validating this assumption.

Finally, the approach of using habitat thresholds to manage disturbance is not new. For example, in Canada it has been used in caribou conservation, where there was also uncertainty as to the level of disturbance that could result in sustainable versus unsustainable conditions for the species. In this case, a 'risk-based' approach was used to establish a management threshold - a population range with 65% undisturbed habitat is expected to have a 60% probability of supporting a population that is stable or increasing over time. This approach had associated research and monitoring, where implementation and success could be well monitored, whilst the threshold provided a focus for management and collaboration between different stakeholders.

Until more is known about habitat quality, prey availability, influencing factors and variability within the sites, a simple area-based approach, which assumes even habitat quality throughout sites and across seasons, is a foundation which can be built upon. In addition, in the absence of evidence on the proportion of the site that must remain permanently available to porpoise for the site to continue to contribute to FCS, the SNCBs looked at ecological concepts to guide the setting of these thresholds. As in the case of caribou conservation,

when there is much uncertainty, the use of a threshold in the context of an adaptive management framework associated with monitoring can succeed as a basis for the management of pressures. To test some of the assumptions, site monitoring needs to be put in place in order to understand how harbour porpoise use the sites and the food web dynamics influencing porpoise abundance and distribution.

2.3. Not using a set SAC population size in HRA assessments

Comments: 90

As explained in the background document, as a mobile and wide-ranging species, density and abundance of harbour porpoise within the site varies considerably by season and year and it is therefore not appropriate or practical to aim to maintain a given harbour porpoise abundance in the site. A comment was made that other mobile wide-ranging species, such as seabirds and coastal bottlenose dolphins, have had population level objectives associated with their protected sites and therefore assessed under HRA. However, for seabirds, being central place foragers, the population level is associated with breeding colonies on land, which have much less variable abundance. Whilst the bottlenose dolphins frequenting the SACs have much smaller, coastal ranges than harbour porpoise, and with more stable abundance and distribution. In addition, bottlenose dolphins and many seabirds are regularly and more effectively surveyed, allowing for increased confidence in abundance estimates and more comprehensive time-series that are used to inform management.

2.4. Favourable Conservation Status and UK Marine Strategy Assessment

Comments: 41

The MSFD assessment BEIS-OPRED refers to is the 2012 UK initial assessment. However, in the updated assessment of 2018 it states: “The extent to which GES had been achieved for cetaceans remains uncertain.” In addition, the latest Habitats Directive Article 17 FCS report for the UK concludes that for Harbour Porpoise both the overall assessment of conservation status and the overall trend in conservation status are ‘Unknown’.

2.5. The interpretation of significant disturbance

Comments: 75

The interpretation in the guidance comes from EC Guidance on article 6.4.³ which considers that significant disturbance of a species in a Natura 2000 site could be:

1. Any **event** which contributes to the long-term decline of the population of the species on the site
2. Any **event** contributing to the reduction or to the risk of reduction of the range of the species or reduction of the size of the habitat within the site.

³https://ec.europa.eu/environment/nature/natura2000/management/docs/art6/Provisions_Art_6_nov_2018_en.pdf

2.6. Seasonal areas within the SACs

Comments: 13, 48, 134

The outputs of the analysis from Heinänen and Skov (2015), which were used to inform SAC designation, identified large areas that contained porpoise density within the top 10% of all estimates within the Management Unit (e.g. North Sea) and persistently so over the 1994-2011 period of the analysis, taking into account the degree to which high densities were predicted to occur recently. These areas were identified seasonally, and this was recognised when establishing boundaries for the sites. The assumption is that sites are used differently during summer and winter, presumably driven by shifts in prey/prey preferences. As stated in the background document, during the 'off season' the area is no different in terms of average densities than the rest of the MU, hence from a disturbance management perspective the SNCBs do not think it is currently necessary to have additional noise management measures beyond the EPS measures (see point 2.9). In addition, the Commission Decision (EU) 2017/848 asked Member States to establish threshold values for levels of impulsive noise occurring in their waters; this work is ongoing through OSPAR and Commission expert groups and may lead to Management Unit level thresholds for noise.

Furthermore, the seasonal approach to management in the guidance only applies to Conservation Objective 2: 'There is no significant disturbance of the species.' Other conservation objectives apply year-round since they address more permanent impacts that could affect the site independently of the time of the year they occurred in (e.g. habitat change/removal which could impact prey species).

Again, fine scale site monitoring needs to be established. This is crucial to better understand the differences between the seasons in terms of porpoise densities and site use and if there have been any changes since the distribution analysis that underpinned the SAC designation was undertaken.

2.7. Risk that the approach to reduce the spatial footprint of noise within SACs may inadvertently increase the duration of the overall operations

Comments: 49, 62, 63

SNCBs acknowledge that the area-time threshold approach to noise management will result in some operations taking longer than they would have otherwise. However, this is unlikely to result in longer periods of actual noise given that the thresholds will translate into gaps in operations without the need for these to be repeated or re-started. Crucially though, the approach will mean fewer consecutive periods where a large proportion of the site might be unavailable (or where prey availability might be reduced). With the current plans and timescales for large scale wind farm installation in the southern North Sea, noisy activities will continue for the next decade, and it would be very challenging to shorten this long-term timeframe. Even if there was conclusive evidence that it was better to concentrate noisy activities, industries' own constraints (e.g. vessel availability) would be an issue.

In sites where operations are sporadic, it may make more sense to concentrate the noisy work as much as possible and avoid the higher density season. Adjustments to operations

such as seismic survey track design (sequential lines instead of racetrack), concurrent piling of adjacent piles, limits to distance between UXO clearances in a day, can all help reduce duration of individual operations whilst also minimising the spatial footprint.

The threshold approach is a trade-off between having many consecutive days where a large portion of the site is affected or having many more days with some effect but with a smaller spatial footprint, leaving no less than 80% of the site available for harbour porpoise each day and no less than 90% within each season. Given the planned number of activities affecting some of the sites for many years to come, seasonal and daily limits help to spread out the impact within the high density (most vulnerable) season and avoid clusters of consecutive days with a significantly reduced habitat available within the sites. This is particularly important for species like porpoise that do not store lots of energy and where consecutive days with reduced prey intake could result in impacts on vital rates (Wisniewska et al. 2016).

The scientific evidence is currently inconclusive as to whether it is better to spread the noise out over time or impact a greater area for a shorter time. Studies that have modelled different wind farm installation scenarios have shown considerable variability in outputs. However, there is some suggestion that spreading the noise over time and space results in less impacts on harbour porpoise populations. For example, [DEPONS](#) (Disturbance Effects on the Harbour Porpoise Population in the North Sea, Nabe-Nielsen et al. 2018) found that there was a larger impact with one day between piling events than two days, i.e. population effects were larger when completed quicker, than when local densities had more time to recover between consecutive pilings. Another [study](#), looking at the sensitivities of the iPCoD (interim Population Consequences of Disturbance) model found that the temporal pattern mattered, but it depended on the size of the affected population. Kastelein 2019b and Booth, 2019 have also shown that if prey is available, porpoise can quickly compensate for a short bout of reduced feeding, supporting the potential benefit of more spaced noise events. It would be useful to use existing models populated with more empirical data to explore this further as there is currently no clear evidence supporting either approach.

2.8. Fixed sound level limits

Comments: 2, 9, 10, 12, 20, 22

There is currently no agreed approach to managing noise across European member states and it is up to each state to employ the measures they consider proportionate and precautionary to protect species and their habitats, whilst allowing economic activity to proceed in a sustainable way. The setting of fixed maximum sound levels and universal use of noise abatement systems is not considered by SNCBs to be a proportionate approach when there are alternative precautionary measures available to reduce the noise disturbance footprint and the risk of injury. Nevertheless, noise abatement systems should still be a key element in contributing to the reduction in the cumulative disturbance footprint within sites. Some of the systems have been proven effective in, for example, reducing the deterrence ranges resulting from turbine foundation installation (see section 2.14). However, their use needs careful planning since concerns have been expressed that systems such as bubble curtains may result in unintended consequences to the environment, i.e. significantly increase the carbon footprint and noise from the additional vessels required.

Furthermore, as discussed in the background document, the German thresholds⁴ were developed and employed to reduce the risk of hearing damage to porpoise. For disturbance, the German noise management approach also includes spatio-temporal thresholds, albeit these are more precautionary than the UK ones (10% of EEZ and 1% of SAC during breeding season). However, they assume an EDR of 8 km if noise abatement systems are used for piling operations. As several studies have shown, the actual EDR is likely to be much greater (Rose et al. 2019, Dahne et al. 2017), although this can vary depending on the type and number of noise abatement systems used.

2.9. Advice for managing noise levels of individual operations/projects within and outside SACs

Comments: 2, 4, 10, 13, 19, 22

Applying the [Habitats Directive two pillars of nature conservation](#), strict protection is afforded to harbour porpoises throughout their range (via EPS legislation), and complementary protection is afforded to important habitats for the species in areas designated as SACs. Operations/projects that could result in injury and disturbance may therefore need to modify their characteristics in order to reduce the risk to individuals and their habitats, both within and outside protected sites.

In harbour porpoise SACs, the advice on avoiding significant disturbance applies to plans/projects alone and in-combination. For the largest SACs such as the SNS SAC, most individual operations/projects are unlikely on their own to result in an adverse effect on site integrity. This is due to a relatively small spatial footprint when compared to the area of the site combined with the temporary nature of noise effects. For smaller sites, some individual operations will likely have to modify their planned approach in order to reduce their spatial and temporal footprint. For many, this is likely to take the form of noise mitigation/abatement systems which will reduce the disturbance ranges.

In areas outside (but also within) the SACs, operations/projects with the potential to result in injury or disturbance can only go ahead if mitigation measures can be employed in order to reduce the risk to individual animals. To reduce the risk of hearing damage in the immediate area around the noise sources, measures such as a 'soft start', marine mammal observers enforcing mitigation zones and acoustic deterrent devices are routinely employed. It is more challenging to reduce the risk of disturbance at larger ranges and therefore an activity can only go ahead with a licence under the EPS regulations. Licences should only be issued when there are no satisfactory alternatives (alternative methods that would not cause disturbance) and if the activity does not have an effect on a species' FCS. All projects that could result in disturbance according to the EPS regulations will need to undertake an assessment of the impacts on the species' FCS from the project alone and in combination with others. If an impact cannot be ruled out, then the project cannot not be licensed as planned. For those licences that are issued, it is incumbent on competent authorities to monitor the effect of these on the population(s) of the species to ensure that there is no detriment to FCS from cumulative effects of the licences. Advice on EPS Regulations and interpretation can be found [here](#).

⁴https://www.ascobans.org/sites/default/files/document/AC21_Inf_3.2.2.a_German_Sound_Protection_Concept.pdf

In addition, efforts are underway (through [OSPAR](#) and the [European Commission](#)) to better quantify the cumulative noise pressure on marine species and if necessary manage it at a regional level by the setting of threshold values, so that levels of impulsive sound and low frequency continuous sound do not exceed levels that adversely affect populations of marine species.

2.10. The use of population consequences models to assess the potential for adverse effect on site integrity

Comments: 4, 28

As discussed in the background document (section 2a), despite uncertainties around harbour porpoise movements, abundance, and how disturbance affects energy budgets and vital rates, models such as [DEPONS](#) and [iPCoD](#) can help to understand the mechanisms and magnitude of effects of disturbance and to compare different scenarios which may inform wider scale population-level assessments. However, some of the data inputs and choice of parameters can have a large influence in the model outcomes and therefore caution is needed when interpreting these. So, we agree with the view that there is 'some merit in these models as contextual information on the health of populations at management unit level.' However, in the context of assessing effects on harbour porpoise SAC *site integrity*, namely when addressing the conservation objective on avoiding significant disturbance, their use was considered not appropriate for the reasons explained in the background document and in section 2.2 of this report.

2.11. Concern that as a result of the SNCB recommended approach there could be a population decline

Comments: 5, 7, 9, 22

One comment questioned whether the approach is allowing a population decline by allowing habitat/carrying capacity loss within the site. This should not occur since all activities within the site need to comply with the European Protected Species (EPS) strict protection measures. Hence, an activity that could affect the species' FCS would not be allowed to take place. In addition, the area-time thresholds have an associated level of precaution, for example, field data shows that porpoise deterrence or behavioural changes do not occur to all individuals within the affected area and so it is likely that with the exception of perhaps a small area around the noise source, the temporary habitat loss or reduction in quality is only partial. Also, the potential habitat loss/lowered quality is temporary, as once the noise ends so does the disturbance.

Some stakeholders highlighted the population consequences assessment by Heinis et al. 2019, guided by the principle that noise management in Dutch waters would, with high certainty, ensure that the population would not decline by more than 5% as a result of the installation of ten offshore wind farms in the next decade. This was deemed a more precautionary objective than the UK's choice of using the ASCOBANS aim of maintaining or restoring populations to 80% or more of the carrying capacity. However, the SNCB guidance has not set an 'allowable decline' since this would be contrary to the HRA requirements. The ASCOBANS objective was simply used to guide the minimum carrying capacity we should be aiming for in the SACs, which is more precautionary than elsewhere in the species range.

As described in section 2.2, the purpose of the ASCOBANS Agreement was 'to achieve and maintain a favourable conservation status for small cetaceans' and 'to restore and/or maintain biological or management stocks of small cetaceans at the level they would reach when there is the lowest possible anthropogenic influence'⁵. The figure of 80% or more of the carrying capacity was chosen as a guide after taking account of information for other cetacean species which indicated this is above the level of maximum productivity and therefore more appropriate for a conservation agreement. Therefore, this level is considered a precautionary approach to the conservation of small cetaceans and the management of anthropogenic activities. The guidance is recommending an average of 90% habitat availability without noise in the highest density season and therefore represents higher levels of protection inside the SACs than elsewhere.

2.12. Activities/industries not covered by the guidance

Comments: 8, 24, 33, 34, 35, 38, 39, 40, 88, 102, 103, 104, 114, 131

The SNCB guidance applies to activities such as geophysical surveys and pile driving independently of which industry undertakes the activity. The guidance indicates the type of activities that are covered by the advice, without providing an exhaustive list. For example, it only applies to regulated activities since consenting processes in place allow for planning and enforcement of conditions. While the Habitats Regulations apply to all activities, article 6 only applies to plans and projects, therefore excluding some activities that do not fall under this category. However, this does not mean that activities not covered by article 6 do not cause disturbance or do not need management.

Shipping noise, for example, can cause disturbance to harbour porpoise and could make preferred habitats less attractive (habitat displacement, area avoidance, masking). SNCB advice on operations⁶ advised that shipping poses a medium risk to sites, but that additional management is unlikely to be required based on current levels of activity. However, the advice was also that significant increases in vessel traffic (e.g. associated with the installation of wind farms), would need further assessment. It is likely that some of the more chronic vessel noise pressure will be concurrent with associated noisy activities covered by the guidance such as the case of vessels undertaking a geophysical survey or supporting turbine installation. This potential disturbance is therefore partly accounted for in disturbance footprint estimates since the disturbance caused by the activity will be greater than that of the vessel. However, there may be some additional disturbance from the trips to and from harbours and this should be quantified and placed into context of wider shipping, such as fishing vessels and cargo ships and the potential contribution to reduced habitat availability within the site. Competent authorities should therefore investigate the need for managing vessel pressure in SACs. The monitoring of shipping noise is already underway to meet requirements of the UK Marine Strategy and OSPAR on ambient noise and this will increase our understanding of the noise pressure from shipping and inform our advice in this area.

There are also several geophysical surveys that are not regulated, such as those used to map the seabed for offshore wind developments. Whilst the disturbance arising from these

⁵ https://www.ascobans.org/sites/default/files/document/Inf25_SC-50-SM12.pdf

⁶ For example: <https://hub.jncc.gov.uk/assets/206f2222-5c2b-4312-99ba-d59dfd1dec1d#SouthernNorthSea-conservation-advice.pdf>

surveys is likely to be very small given their characteristics (highly directional and most produce noise at very high frequencies, with higher transmission loss), more evidence is needed on their disturbance potential and management measures applied if appropriate.

While some concern was expressed that a number of potentially disturbing activities might not be captured by the guidance, we consider that the precautionary principle was proportionately applied in the choice of the 10/20% thresholds and the associated EDRs. Therefore, whilst we advise that more evidence should be gathered on these activities, there is some leeway in the approach for a small amount of noise we may not be capturing. The revised guidance also now states that the aim should be to keep below the thresholds as much as possible.

2.13. Strategic Monitoring

Comments: 3, 11, 78, 114

The SNCBs support calls for strategic monitoring to be put in place to, for example, validate the EDRs. Competent authorities have the responsibility to report on the effectiveness of conservation measures and monitor the condition of the SACs, hence monitoring is key to this requirement. We agree that efforts to overcome existing issues in conditioning strategic monitoring as part of individual project consents are urgently required.

In relation to site condition, a programme of systematic visual surveys and the deployment of arrays of acoustic recorders should be rolled out to all sites (see [JNCC report 629](#)). In addition, the [Joint Cetacean Data Programme](#) aims to be able to provide regular outputs based on survey data to support decisions requiring information on the distribution and abundance of cetaceans at various spatial and temporal scales. However, the next phase of the JCDP requires funding for it to become operational.

2.14. Effective Deterrent Ranges (EDRs)

Comments: 11, 21, 23, 26, 31, 51, 52, 54, 55, 56, 57, 58, 59, 60, 67, 70, 72, 82, 83, 88, 102, 103, 105, 107, 108, 113, 114, 115, 121, 125, 129, 132, 135

The EDRs recommended in the guidance were chosen because they are considered by the SNCBs to be precautionary but proportionate given the lack of a comprehensive evidence base. Any evidence to enable the use of less conservative EDRs needs to be robust and it is incumbent on industry and government to commission research to validate these ranges. The ranges recommended in this guidance were informed by the published ranges where the bulk of the effect (reduction in porpoise vocal activity or sightings) had been detected. They are not equivalent to 100% deterrence/disturbance in the associated area (i.e. some animals show greater avoidance than others) as this only tends to occur in very close proximity to the source, nor do they represent the range limit at which effects have been detected. In addition, the full spectrum of animals' response to noise has not been or cannot yet be recorded (e.g. physiological changes) and so it is possible that those studies observed only the most visible of effects.

Field studies have shown that there is an expected gradual lessening of observable effect with distance and with received sound levels. Some studies have derived a sound dose-

response curve by plotting effect (such as changes to porpoise acoustic activity) against received sound levels and distance from source (e.g. Graham et al. 2019). Using received levels to estimate disturbance responses is favoured by some stakeholders. However, distance is usually the best predictor of response (e.g. Sarnocińska et al. 2020). In addition, using sound levels involves noise propagation modelling and a choice of a disturbance proxy sound level threshold. Currently we do not favour this approach for the reasons laid out in the background document, i.e. noise modelling uncertainty, complexity and variability, lack of widely agreed quantitative disturbance thresholds, and variability of animal response to sound levels.

In relation to *pile driving*, it is acknowledged that the pile characteristics such as diameter and hammer energy will have some influence on the source noise and therefore on the propagated sound levels and disturbance range. However, these are only two of the factors influencing porpoise response. Whilst we do not ask for these specificities to be incorporated into assessments of disturbance, these get accounted for indirectly and at a higher level in the current categorisation, i.e. monopiles tend to use larger diameters and hammer energies than conductor/pin piling.

Some of the comments received mentioned the German noise management approach and the benefits of mitigated piling in reducing the disturbance range. In the German noise management approach, an EDR of 8 km is used for mitigated piling, the distance at which the modelled sound exposure level of approximately 140 dB re 1 μ Pa²s (chosen as a disturbance sound threshold) is reached for a typical German pile driving event. However, field observations have seen effects up to 12 km (Dahne et al. 2017) and 19 km (Rose et al. 2019), hence the modelled 8 km would not be sufficiently precautionary to use in UK waters for mitigated piling. While noise abatement has been shown to reduce noise propagation (e.g. Rose et al. 2019), different projects have used different systems (or combinations of systems) (e.g. table 3.3 in Rose et al. 2019) and reported the observed effects differently meaning it is not possible to recommend EDRs for different combinations of noise abatement and piling characteristics as some respondents requested. For these reasons the recommended EDR for all mitigated piling is now 15 km, representing an approximate average of the observed effect distances in field studies.

More detail has been added to the noise guidance on the studies used to underpin the EDRs. However, for some noise sources, there isn't any published empirical evidence on porpoise responses. For those, the EDR has been based both on noise measurements and the most precautionary range observed for a noise source that is comparable to the one in question, e.g. for conductor piling used in oil and gas wells, an EDR of 15 km is recommended. The evidence here combines generally lower noise levels measured relative to monopiles (Jiang et al. 2015, MacGillivray 2018) with the smaller observed impact ranges for similar smaller diameter pin piles used in the Moray Firth (Graham et al. 2019). This is also the distance used for conductor piling by BEIS in HRAs for the oil & gas licensing seaward rounds.

We agree that some of the sub-bottom profilers used in high resolution geophysical surveys might eventually drop out of the activities covered by the guidance. These are highly directional sources; many operating at high frequencies and therefore subject to high transmission loss (e.g. Crocker & Fratantonio 2016, Crocker et al. 2019). However, there are

several of these systems that fall within more medium frequencies likely to propagate longer distances and therefore have the potential to cause disturbance to porpoise. There are several different types of sub-bottom profilers, and the available evidence so far comes from noise measurements and modelling and not field observations of porpoise disturbance. The 5 km distance is therefore a precautionary, likely conservative EDR but without the evidence to further reduce the EDR or even eliminate these sources from assessments, our advice remains. Again, this is in line with the precautionary principle, in the absence of evidence of no impact. It is up to operators to provide the evidence otherwise.

In relation to UXOs, although the noise produced of an individual clearance will be of very short duration (single pulse), and so could potentially result in smaller behavioural reactions, these produce the loudest noise of all impulsive noise sources, are usually cleared in clusters and there will also be disturbance during the operation as a whole from vessel presence. Hence the advice is to use the largest range observed for an impulsive noise source, i.e. monopiles – 26 km, in the absence of empirical evidence. Field data is needed to validate this EDR. There is an ongoing BEIS Offshore SEA Research project which should contribute to our understanding of UXO clearance noise.

For seismic surveys, there are now two studies (Thompson et al 2013 and Sarnocińska et al. 2020) that looked at porpoise responses to airgun arrays of 400 and 3750 cubic inches respectively. Both have found the bulk of the effect to be within 8-12km, despite the large difference in the size of the airgun array. The revised guidance therefore recommends a precautionary 12 km EDR for seismic surveys.

2.15. Using 24 hours as the effect temporal footprint

Comments: 53, 66, 67, 68, 75, 76, 83

Most harbour porpoise disturbance studies showed a return to baseline levels of acoustic activity or presence within a few hours to a few days. The duration of observable effect will be influenced by the duration of the noise source and other factors (some intrinsic to the animal, others related to habitat and prey availability). From a noise management perspective, it will be challenging to use any finer temporal scale than a 'day' (24 hours) and different recovery times for different activities. For geophysical surveys which are moving sources of noise any one point within a 12 km EDR would be ensonified between 1.62 and 3.24 hours for a vessel moving at 4 knots. A piling event may last a couple of hours or longer and it is a static source of noise, so all points within the EDR will be potentially ensonified over the duration of the piling.

Some comments highlighted that because of the moving nature of seismic surveys that the temporal footprint will be much smaller than 24 hours. However, the evidence shows that the effect may last longer than the passage of the vessel. In the Moray Firth it took 19 hours for porpoise to be detected again at all sample locations, although there was a decrease in this time over the duration of the survey suggesting some potential habituation (Thompson et al. 2013). Van Beest (2018) demonstrated changes to diving and movements for up to 8 hours when individual tagged porpoises were exposed for 1 minute to a single small airgun (10 cubic inch) at a range of about 1 km. It is likely that the survey track designs (sequential tracks or racetrack) and how long each line is will have an influence on recovery times.

However, given the results of the above studies, the SNCBs consider 24 hours to be a precautionary and proportionate temporal footprint for seismic surveys.

2.16. 10Hz to 10 kHz frequency range

Comments: 38, 42, 60, 104, 106, 116, 133

At frequencies above 10 kHz increasing absorption prevents sound propagating over great distances. Values for absorption are typically around 1 dB/km at 10 kHz rising to around 30 dB/km at 100 kHz. This was the rationale behind the European Commission Noise Task Group's choice for the types of activities that could cause disturbance to marine species and therefore chosen to be monitored as part of Descriptor 11. 'The choice of the upper limit of the frequency band (10 Hz to 10 kHz) in the Commission Decision 2010 is based on the fact that sounds at higher frequencies do not travel as far as sounds within this frequency band. Although higher frequency sounds may affect the marine environment, they do so over shorter distances. This choice of bandwidth, therefore, also excludes most depth-finding and fishery sonars. The indicator is focused on those impulsive sound sources that are most likely to have adverse effects, and the sources that generate sound in this frequency band'. It therefore made sense to align the guidance with this indicator and the data collated through the UK [Marine Noise Registry](#) which fulfils the data needs for it.

We acknowledge that the harbour porpoise is categorised as a very high frequency species and therefore will be more sensitive to higher frequencies than 10 kHz. However, they also hear at lower frequencies of less than 1 kHz and are sensitive to disturbance from sources that are characterised by loud sound at low/medium frequency (e.g. seismic surveys, shipping). The frequency range 10Hz to 10 kHz is the range at which most sources known to disturb porpoise have their peak energy at and therefore this range captures the great majority of activities of interest. However, we have now added some flexibility in the guidance with regards to this upper range acknowledging that there are also sources more typically characterised by frequencies above 10 kHz (some Acoustic Deterrent Devices) and that are known to cause disturbance beyond the vicinity of the source. The guidance aims to cover most activities with potential to disturb porpoise, but avoiding unnecessary restrictions, for example, to the operation of equipment associated with some high-resolution geophysical surveys, which emits very directional sound at very high frequencies. We will review this advice regularly.

2.17. The use of Acoustic Deterrent Devices (ADDs)

Comments: 23

SNCB guidance does not specifically address the use of ADDs. Whilst in theory the great majority of commercially available ADDs are covered by the guidance, in practice they are used in conjunction with either piling or UXO clearance and therefore any disturbance footprint estimates will be driven by the main activity. ADDs are employed to disturb animals away from loud sources of noise in order to reduce the risk of injury. Concerns have been raised that in cases of mitigated piling, the ADDs might be causing greater disturbance than the piling. It is essential that the choice of ADD and their use is carefully assessed through discussions around Marine Mammal Mitigation Plans to ensure that they do not cause greater disturbance than the activity itself and that these are tailored to the injury zone.

2.18. Acoustic Fish Deterrents (AFDs)

Comments: 112

Some generation sites operate AFD systems which introduce noise into the marine environment in order to deter fish from entering cooling water intakes. The area around the intake from which fish need to be excluded is very small. AFD outputs should be tailored to that scale of effect so that no noise specific management should be required.

2.19. Advice for Scotland and Wales

Comments: 84, 90, 128, 129

Application of the current noise guidance in Scotland was not considered necessary primarily due to a different set of noise issues relevant to the single Scottish harbour porpoise SAC in the Inner Hebrides & Minches. This has been confirmed by Marine Scotland's response to the consultation.

For those sites that are joint responsibility of NRW and NE and/or JNCC, advice may differ between the SNCBs although every effort will be made to align advice as much as possible. NRW has not signed up to this guidance to retain some flexibility in approaches to the management of noise. They wish operators to calculate disturbance distances on a case by case basis using the latest published information and noise modelling procedures, rather than fixed EDRs as in the guidance. NRW do however plan to advise on the application of the area-time thresholds, so the advice should not differ too much between advisors on joint sites. We explain in the background document and in this consultation report the reasoning behind favouring fixed EDRs.

3. References

Booth, C.G., Harwood, J., Plunket, R, Mendes, S, & Walker, R. 2017 Using the Interim PCoD framework to assess the potential impacts of offshore wind developments in Eastern English Waters on harbour porpoises in the North Sea. Natural England Joint Report, Number 024 York.

Booth, C.G. (2019). Food for Thought: Harbour porpoise foraging behaviour and diet inform potential resilience to disturbance. *Marine Mammal Science*, 36, 1-14.

Crocker SE & Fratantonio FD (2016). Characteristics of high-frequency sounds emitted during high-resolution geophysical surveys. OCS Study, BOEM 2016-44, NUWC-NPT Technical Report 12, 203pp.

Crocker SE, Fratantonio FD, Hart PE, Foster DS, O'Brien TF & Labak S (2019). Measurement of Sounds Emitted by Certain High-Resolution Geophysical Survey Systems. *IEEE Journal of Oceanic Engineering* 44: 796-813, doi.org/10.1109/JOE.2018.2829958.

Graham, I.M., Merchant, N.D., Farcas, A., Barton, T.R., Cheney, B., Bono, S. & Thompson, P.M. (2019) Harbour porpoise responses to pile-driving diminish over time. *Royal Society Open Science* 6: 10.1098/rsos.190335

Heinis, F., de Jong, C.A.F., von Benda-Beckmann, S., Binnerts, B. (2019). Framework for Assessing Ecological and Cumulative Effects – 2018. Cumulative effects of offshore wind farm construction on harbour porpoises. 18.153RWS_KEC2018. Rijkswaterstaat Sea and Delta. <https://www.noordzeeloket.nl/en/functions-and-use/offshore-wind-energy/ecology/accumulation-ecological-effects/framework-assessing-ecological-cumulative-effects/>

Hoekendijk JP, Spitz J, Read AJ, Leopold MF & Fontaine MC (2018). Resilience of harbor porpoises to anthropogenic disturbance: Must they really feed continuously? *Marine Mammal Science* **34**: 258-264.

Jiang J, Todd VL, Gardiner JC & Todd IB (2015). Measurements of underwater conductor hammering noise: compliance with the German UBA limit and relevance to the harbour porpoise (*Phocoena phocoena*). EuroNoise 31 May - 3 June, 2015, Maastricht. pp1369-1374.

Kastelein RA, van Heerden D, Gransier R, Hoek L (2013) Behavioral responses of a harbour porpoise (*Phocoena phocoena*) to playbacks of broadband pile driving sounds. *Mar Environ Res* 92: 206–214

Kastelein RA, Helder-Hoek L, Booth C, Jennings N & Leopold M (2019a). High Levels of Food Intake in Harbor Porpoises (*Phocoena phocoena*): Insight into Recovery from Disturbance. *Aquatic Mammals* **45**: 380-388, DOI 10.1578/AM.45.4.2019.380

Kastelein RA, Helder-Hoek L, Jennings N, van Kester R & Huisman R (2019b). Reduction in body mass and blubber thickness of harbour porpoises (*Phocoena phocoena*) due to near-fasting for 24 hours in four seasons. *Aquatic Mammals* **45**: 37-47, DOI 10.1578/AM.45.1.2019.37

Lucke K, Siebert U, Lepper P, Blanchet M (2009) Temporary shift in masked hearing thresholds in a harbour porpoise (*Phocoena phocoena*) after exposure to seismic airgun stimuli. *The Journal of the Acoustical Society of America* 125(6):4060-70

MacGillivray A (2018). Underwater noise from pile driving of conductor casing at a deep-water oil platform. *Journal of the Acoustical Society of America* 143: 450-459

Pirotta, E., Booth, C. G., Costa, D. P., Fleishman, E., Kraus, S. D., Lusseau, D., et al. (2018). Understanding the population consequences of disturbance. *Ecol. Evol.* 8, 9934–9946.

Ransijn, J.M., Booth, C. & Smout, S.C. 2019. A calorific map of harbour porpoise prey in the North Sea. JNCC Report No. 633. JNCC, Peterborough, ISSN 0963 8091

Sarnocińska, J., Teilmann, J., Balle, J.D., van Beest, F.M., Delefosse, M., Tougaard, J. Harbor porpoise (*Phocoena phocoena*) reaction to a 3D seismic airgun survey in the North Sea. *Front. Mar. Sci.*, 6 (2020), p. 824

Thompson P.M., Brookes K.L., Graham I.M., Barton T. R., Needham K., Bradbury G. and Merchant N.D. (2013). Short-term disturbance by a commercial two-dimensional seismic survey does not lead to long-term displacement of harbour porpoises. *Proceedings of the Royal Society B: Biological Sciences*. DOI: 10.1098/rspb.2013.2001

Tougaard, J., Buckland, S., Robinson, S. and Southall, B. (2013). An analysis of potential broad-scale impacts on harbour porpoise from proposed pile driving activities in the North Sea. Report of an expert group convened under the Habitats and Wild Birds Directive – Marine Evidence Group MB0138. 38pp.

Nabe-Nielsen J, van Beest F, Grimm V, Sibly R, Teilmann J & Thompson P (2018). Predicting the impacts of anthropogenic disturbances on marine populations. *Conservation Letters* **11**, DOI: 10.1111/conl.12563

Pirotta, E., Brookes, K. L., Graham, I. M., and Thompson, P. M. (2014). Variation in harbour porpoise activity in response to seismic survey noise. *Biol. Lett.* 10:4. doi: 10.1098/rsbl.2013.1090

van Beest, F. M., Teilmann, J., Hermanssen, L., Galatius, A., Mikkelsen, L., Sveegaard, S., et al. (2018). Fine-scale movement responses of free-ranging harbour porpoises to capture, tagging and short-term noise pulses from a single airgun. *R. Soc. Open Sci.* 5:170110. doi: 10.1098/rsos.170110

Wisniewska, DM, Johnson, M, Teilmann, J, Rojano-Doñate, L, Shearer, J, Sveegaard, S et al. (2016). Ultra-high foraging rates of harbor porpoises make them vulnerable to anthropogenic disturbance. *Current Biology* 26, 1441–1446. doi: 10.1016/j.cub.2016.03.069

Appendix 1: All comments received during consultation on the SNCB noise guidance

The table below lists all comments received from the following stakeholders: The Wildlife Trust, Whale & Dolphin Conservation Society, Wildlife LINK, The Crown Estate, Seabed User and Developer Group (SUDG) and an SUDG member, BEIS OPRED, Oil and Gas UK, IAGC, Genesis, Hartley & Anderson, EDF, Renewables UK, Energy UK, Marine Scotland, Natural Resources Wales, CEFAS

Theme	Comment reference number	Comment	Comment by
General	1	While we have low confidence in the evidence underpinning the area-based approach (see later comments), we do appreciate the benefits of this approach in managing in-combination impacts. More robust scientific information exists (see later comments) which could be used to underpin the area-based approach, such as the implementation of a noise limit. Finally, we have outstanding concerns regarding the evidence and implementation of the SNCB advice (see later comments).	The Wildlife Trust
2.8. Fixed sound level limits 2.9. Advice for managing noise levels of individual operations/projects within and outside SACs	2	The SNCB advice allows the management of in-combination underwater noise disturbance impacts. However, it does not manage noise levels of individual operations which could have negative disturbance impacts. Therefore, we suggest that a combined area-based threshold and a noise limit should be considered.	The Wildlife Trust
2.13. Strategic Monitoring	3	A strategic approach to monitoring of both noise levels and harbour porpoise activity is urgently required to understand the effectiveness of the proposed SNCB advice. It is the responsibility of the competent authority to monitor the effectiveness of mitigation measures and take corrective measures if necessary ¹ . Regulators must overcome the issues in conditioning strategic monitoring as part of offshore wind Development Consent Orders as it is the most appropriate way to understand the effectiveness underwater noise management.	The Wildlife Trust
2.9. Advice for managing noise levels of individual operations/projects within and outside SACs 2.10. The use of population consequences models to assess the potential for adverse effect on site integrity	4	It must be recognised that, due to the uncertainty on the SNCB approach and that it is applied only within harbour porpoise SACs, there is still a risk to harbour porpoise populations at a Management Unit Scale and as a European Protected Species. Considering just North Sea impacts, the scale of development from offshore wind is huge with a potential of 450GW by 2050 ⁴ . If underwater noise management is not fit for purpose at this scale, then both the Southern North Sea SAC and wider harbour porpoise population could be negatively affected. This also applies to other marine mammals which use this area.	The Wildlife Trust

		We proposed that discussions must begin now on how to manage cumulative underwater noise disturbance impacts on a North Sea scale. The benefits on engaging at an OSPAR level should also be considered	
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<p>2.2 ASCOBANS conservation objective, carrying capacity and 20/10% thresholds</p> <p>2.11. Concern that as a result of the SNCB recommended approach there could be a population decline</p>	<p>5</p>	<p>The thresholds set are based on carrying capacity, yet there is no evidence to support a carrying capacity value for harbour porpoise. There is no evidence to support where the most important feeding areas are within the harbour porpoise SACs and how porpoise use the sites, which would all underpin a carrying capacity value. The Dutch Government recognise that ASCOBANS target that the population should not fall below 80% of the carrying capacity level. But they also recognise that 80% carrying capacity is not known in Dutch Territorial Waters, and therefore maintaining the population at a high degree of certainty at 95% of its current size is considered a 'safe choice'</p> <p>The evidence used to underpin the area-based thresholds proposed by the SNCBs has no scientific basis and therefore a more precautionary value should be implemented.</p>	<p>The Wildlife Trust</p>
<p>2.2. ASCOBANS conservation objective, carrying capacity and 20/10% thresholds</p>	<p>6</p>	<p>Tougaard et al (2013) paper, as highlighted in the SNCB background document, the Tougaard et al 2013 paper became the foundation in the development of the advice. This paper suggests the best way to reduce underwater noise impacts is to reduce the Effective Deterrence Radius (EDR). We support this approach but suggest there are more scientific ways to reduce the EDR rather than setting an arbitrary carrying capacity figure (see further evidence in Appendix B).</p> <p>The Tougaard et al paper makes no recommendations to use carrying capacity as the basis for reducing the EDR. Carrying capacity is used in this document as a principle to undertake simple modelling to predict the impact of underwater noise disturbance on harbour porpoise populations and the document states that the model outputs should be viewed with caution.</p>	<p>The Wildlife Trust</p>

<p>2.2. ASCOBANS conservation objective, carrying capacity and 20/10% thresholds</p> <p>2.11. Concern that as a result of the SNCB recommended approach there could be a population decline</p>	<p>7</p>	<p>Although the SNCB guidance is focused on Conservation Objective 2 “There is no significant disturbance of the species”, if disturbance is not correctly managed, it could impact on conservation objective 1 “Harbour porpoise is a viable component of the site” in the form of population declines.</p> <p>The draft guidance itself states “if disturbance resulted in the habitat loss of 1% of the total area, the carrying capacity of the population would also decrease by 1%. Over some years the population would thus also decrease by 1%”. Does this mean that the proposed SNCB guidance is allowing a population decline? If so, this will undermine the Favourable Conservation Status (FCS) of the site and undermine Conservation Objective 1.</p> <p>broadly speaking, in order to comply with their Article 6 duties, the authorities need to ensure that noise levels do not prevent the outcomes I. the population is stable, II. the nature range of the species is not being or likely to be reduced; and III. there is a sufficiently large habitat to maintain populations on a long-term basis from being achieved. We highlight that the authorisation criterion laid down in the second sentence of Article 6(3) of the Habitats Directive integrates the precautionary principle. Efforts must be made over the coming year to monitor and review the SNCB approach to understand its effectiveness. Alongside this, evidence put forward on more precautionary approaches must be considered.</p>	<p>The Wildlife Trust</p>
<p>2.12. Activities/industries not covered by the guidance</p>	<p>8</p>	<p>We appreciate that some activities are not regulated and therefore difficult to manage e.g. shipping. However, noise from vessel movement contributes to cumulative noise effects and has been included in offshore wind farm in combination assessments for a number of years. Vessel movement should not be discounted in in-combination assessments.</p>	<p>The Wildlife Trust</p>

<p>2.8. Fixed sound level limits</p>	<p>9</p>	<p>As there is little evidence to support the thresholds set by the SNCBs, we suggest that a noise limit should be considered. As highlighted by Tougaard et al (2013), the key to reducing the impacts of underwater noise disturbance is to reduce the Effective Deterrent Radius (EDR). We suggest a noise limit provides a more scientifically robust method to underpin the EDR.</p> <p>Many studies have been undertaken to understand the noise level at which disturbance occurs (e.g. Brandt et al (2018), Kastelein et al (2013)¹⁵, Lucke et al (2009)¹⁶) and a noise limit is already implemented in Germany and the Netherlands to manage disturbance. We suggest a noise limit provides more scientific certainty on the management of disturbance effects on harbour porpoise. In Germany, the noise limit has a dual purpose of managing underwater noise injury and disturbance impacts. The German noise guidance states that disturbance is anchored within the framework and on page 22 highlights that the figure of 160 dB re 1µPa² s at a distance of 750 m (the level used to manage injury impacts) results in a disturbance zone of 8km, demonstrating that the use of a noise limit greatly reduces the area of disturbance¹⁷.</p> <p>In the Netherlands, management must ensure that underwater noise does not cause a reduction in harbour porpoise populations in territorial waters by more than 5%/2550 animals. The Dutch Government recognise the ASCOBANS target in that the population should not fall below 80% of the carrying capacity level. But they also recognise that 80% carrying capacity is not known in Dutch Territorial Waters, and therefore maintaining the population at a high degree of certainty at 95% of its current size is considered a 'safe choice'.</p> <p>A recent study undertaken in the Netherlands to assess the cumulative impact on harbour porpoise of offshore wind farm construction (piling) and seismic surveys would cause a population decline between 2599-4310 but with the implication of the sound standard (163 SELss at 750 m in dB re 1 µPa 2s), a decrease between 312-451 would be expected. It should be noted that this assessment also considers cumulative impacts on a North Seas level and predicts the number of piling days in the UK to the period up to 2030 is double the amount expected in the Netherlands. Therefore, it could be assumed that the impact on the harbour porpoise population would be much greater than in the UK than the Netherlands, with the potential for a population decline without a noise limit.</p> <p>Several studies show the effectiveness of a noise limit in Germany including:</p>	<p>The Wildlife Trust</p>
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		<p>Brandt et al (2016)¹⁹, which considered the impact from construction of 8 offshore wind farms between 2009-2013 on harbour porpoise in the German North Sea, summarised that piling noise above 143 dB SEL₀₅ led to disturbance effects in porpoises. • Nehls et al (2016)²⁰ showed piling noise under 160 dB at 750 m distance (as intended by the regulatory framework) would lead to a substantial reduction of the area in which porpoises are affected by about 90 % • Dahne et al (2017)²¹ showed that noise mitigation used to meet the German noise standard resulted in a 75% reduction in the exposed area.</p>	
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2.8. Fixed sound level limits	10	<p>The noise limit used in Germany and the Netherlands is applied to every piling operation which means mitigation is implemented for every piling activity to ensure that disturbance minimised. The approach proposed by SNCBs will only require mitigation when, cumulatively, the thresholds are breached and during the 'seasonal' period. Therefore, proposed SNCB threshold provides weaker protection. • Although the SNCB area-based approach will ensure noise mitigation is used in certain circumstances, there is no requirement to implement the mitigation as diligently as would be required for a noise limit approach, and therefore, noise may still be emitted at levels which cause disturbance.</p>	The Wildlife Trust
2.13. Strategic Monitoring 2.14. Effective Deterrent Ranges (EDRs)	11	<p>Some of the levels set, for example for pin piles, are based only on one study. It is essential that monitoring is conditioned within offshore wind planning applications to validate the proposed EDRs. The EDR for monopiles with noise abatement is underpinned by bubble curtain technology. We suggest that this EDR should be applied to monopiles using bubble curtains only. Evidence on the effectiveness of other noise abatement technology must be provided before a broad EDR can be agreed.</p>	The Wildlife Trust
2.8. Fixed sound level limits	12	<p>Prior to the workshop in July 2019, TWT outlined various questions on the proposed SNCB advice including "If the proposed SNCB advice on underwater noise disturbance is published, justification must be provided on why a weaker approach is being implemented in England than other countries which share our seas e.g. Germany".</p> <p>The SNCB background document highlights that the "German sound thresholds (e.g. 160db SEL at 750m) were imposed to address the risk of injury and not disturbance". Whilst we agree that this was the principle reason for setting the noise limit in Germany, this noise limit also has a dual purpose in reducing disturbance impacts. The German noise guidance highlights that disturbance is anchored within the framework and on page 22 highlights that the figure of 160 dB re 1µPa² s at a distance of 750 m results in a disturbance zone of 8km, highlighting that the use of a noise limit greatly reduces the area of disturbance.</p> <p>Evidence is still lacking on the question posed by TWT in July 2019 on why a weaker approach to management is being used in England than in other countries such as Germany, the Netherlands and Belgium.</p>	The Wildlife Trust

<p>2.6. Seasonal areas within the SACs</p> <p>2.9. Advice for managing noise levels of individual operations/projects within and outside SACs</p>	<p>13</p>	<p>We still hold concerns regarding the seasonal split in management of harbour porpoise SACs in relation to underwater noise disturbance impacts. Although harbour porpoise are present in lower numbers in the 'out of season' area, they are still present. We do not know how porpoise use the SACs for activities such as foraging and breeding and therefore we highlight the risk in only assessing and implementing management on a seasonal basis.</p> <p>It is important to recognise that the evidence suggests that there has been a change in harbour porpoise distribution²² over the past 20 years. It is uncertain what is causing these changes, but climate change impacts could be a contributing factor and we expect to see more changes over the next 50 years²³. Moreover, there is little understanding on how the scale of offshore wind farm development over the next 30 years may affect harbour porpoise distribution.</p> <p>Finally, it is important to remember the UK's responsibility to manage harbour porpoise as a European Protected Species. Currently no management for underwater noise disturbance impact is in place for harbour porpoise outside SACs. This approach poses a risk to the harbour porpoise population as a whole which could have knock on effect on the conservation objectives of harbour porpoise SACs.</p>	<p>The Wildlife Trust</p>
<p>2.2. ASCOBANS conservation objective, carrying capacity and 20/10% thresholds</p>	<p>14</p>	<p>Whilst we appreciate that each offshore wind development contributes to temporary loss of habitat, the scale of development to meet the 2050 ambitions for offshore wind may equate into a permanent loss of habitat over the next 30 years. This scale of development may also create a fragmented loss of habitats. Considering we know very little about how harbour porpoise use the SACs, this could have a significant impact.</p>	<p>The Wildlife Trust</p>
<p>Appendix 2: Implementation</p>	<p>15</p>	<p>Through our engagement in casework, we have witnessed the 'envelope' becoming broader each year, resulting in often uncertain and extreme worst-case scenarios. This makes scenario planning of underwater noise impacts by the regulators extremely difficult. For underwater noise management to be effective, developers must start to present more realistic scenarios at the earliest stage possible.</p>	<p>The Wildlife Trust</p>
<p>Appendix 2: Implementation</p>	<p>16</p>	<p>As highlighted above, due to the broad range of scenarios presented by developers on the predicted underwater noise disturbance impact area, it makes it very difficult to predict both a project and strategic level what the cumulative impacts will be to inform an area-based management approach. The risk in this approach is that it is reliant on a retrospective reporting system.</p> <p>We advise that a noise limit would give certainty at an early stage on disturbance impacts and expectations on mitigation requirements. It would</p>	<p>The Wildlife Trust</p>

		also allow real time management and reporting of underwater noise disturbance impacts.	
Appendix 2: Implementation	17	<p>We welcome that discussions are taking place within the Southern North Sea Regulators Working Group on how to manage underwater noise impacts. However, we highlight that offshore wind Development Consent Orders are being passed on the reliance of an in-principle Site Integrity Plan without any regulatory mechanism for underwater noise management. We support the use of a Site Integrity Plans but highlight a lack of detail on the effectiveness of this approach, and minimal conditions in Development Consent Orders in relation to these plans.</p> <p>We also highlight that the delay in the Review of Consents for the Southern North Sea SAC is resulting in offshore wind farms progressing to construction without any conditions relating to the site.</p>	The Wildlife Trust
Appendix 2: Implementation	18	<p>In the introduction, it “is recognised that there is low confidence in the evidence base for the guidance” and so that “regulators can consider (other evidence) in preference to the guidelines”. This will make commenting on individual applications very difficult.</p> <p>In Section 2 they consider quantifying the <i>numbers</i> of porpoise disturbed and secondly in quantifying the <i>loss of habitat</i> available to harbour porpoise. Given the admittance of the low evidence base, both these approaches are flawed.</p>	Whale and Dolphin Conservation Society

<p>2.1. Harbour porpoise feeding rates/needs and prey availability</p> <p>2.2. ASCOBANS conservation objective, carrying capacity and 20/10% thresholds</p> <p>2.9. Advice for managing noise levels of individual operations/projects within and outside SACs</p>	<p>19</p>	<p>Firstly, individual porpoise are protected, not just populations. The Government guidance for disturbance to Bats, under exactly the same legislation, clearly states that it is an offence to “intentionally or recklessly disturb a bat (note emphasis on individual) while it’s in a structure or place of shelter or protection”. We would argue that with mobile species such as porpoise, favoured areas of sea are their place of ‘shelter or protection’. The Habitats Directive states that a system of strict protection needs to be established for animal species listed in Annex IV (e.g. harbour porpoise) prohibiting “[...]; a) deliberate disturbance of these species, particularly during the period of breeding, rearing, hibernation and migration; [...]; d) deterioration or destruction of breeding sites or resting places”. The Conservation of Habitats and Species Regulations 2017 clearly state that ‘disturbance includes any disturbance which is likely (a) to impair their ability (i) to survive, to breed or reproduce, or to rear or nurture their young; [...]’. Driving animals, especially suckling mothers, from favoured feeding areas, or disturbance that separates mothers from calves is clearly an offence, though it is not taken into account in the guidance.</p> <p>The guidance also talks about ‘temporary habitat loss’ due to disturbance. Again, given the uncertainties, we do not know if the habitat lost ‘temporarily’ is vital to individuals or populations. Some areas may be vital feeding grounds known and understood by individuals or individual groups. Wisniewska et al. (2016) report that porpoises forage nearly continuously day and night, attempting to capture up to 550 small (3–10 cm) fish prey per hour with a remarkable prey capture success rate of >90%. Thus, for these “aquatic shrews,” even a moderate level of anthropogenic disturbance in the busy shallow waters they share with humans may have severe fitness consequences at individual and population levels.</p> <p>Furthermore, porpoise, along with other cetaceans, have complex social groups which are not understood and we do not know if they are ‘territorial’ so that driving them into other animals’ ‘territories’ may be extremely damaging.</p> <p>Likewise, spatial thresholds are not applicable for the same reason. It is not the area involved that is key to maintaining favourable status of individuals / populations; it is the quality of the areas involved that is vital to individuals and populations. Arbitrary percentage areas are not ecologically defensible. Case law supports this – advice previously given shows:</p>	<p>Whale and Dolphin Conservation Society</p>
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		<p>“As to the extent of the disturbance required to be significant, in <i>Commission v Spain</i> the SPA covered an area of 43 000 hectares. Mining operations within the site were found to lead to deterioration in the SPA as a result of the destruction of an area of over 17.92 hectares of habitat which could have been used by the capercaillie (Advocate General at 100). This was sufficient to amount to adverse effect on the integrity of the site. Advocate General Kokott also referred to <i>Commission v Italy</i> (<i>‘Santa Caterina’</i>) [2007] ECR I-7495 where the Court held that there was disturbance to an SPA of a similar size from the expansion of a ski run that would only be used in the winter.”</p>	
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<p>2.8. Fixed sound level limits</p>	<p>20</p>	<p>In previous submissions with other NGO's, WDC have advocated the use of noise limits and reduction or mitigation of noise at source. In Germany, noise limits have been used to manage underwater noise since 2013. From our understanding, regulators and developers work to meet noise levels by implementing the following:</p> <ul style="list-style-type: none"> • Noise modelling is used to predict noise levels from piling and to plan the mitigation needed to reduce noise levels to the agreed standard • Test piling is undertaken to test predicted noise levels • A programme of monitoring is undertaken to understand marine mammal abundance and distribution pre- consent, during construction and post construction • A programme of monitoring to understand pre-construction ambient noise levels, construction noise levels of every pile until proof has been provided of continuous, reliable adherence to the noise prevention value and post construction measurements of waterborne operating noise. <p>The German Sound Protection concept requires constant sound exposure levels (SEL) to be less than 160 dB re 1 µPa at 750m (single peaks up to 190 dB re 1 µPa at 750m) from the noise source within the German EEZ. No piling is allowed within harbour porpoise SACs and an adverse effect on a site is to be presumed if at 10% or more of the area of the site is located within the disturbance radius.</p> <p>For example, that reaching the 160dB threshold at the German West II wind farm reduced the noise impact area by 90% while still allowing significant wind farm construction, which would significantly reduce the risk of a population-level decline.</p> <p>Belgium noise management requires Peak Level 185 dB re 1 µPa at 750m across the EEZ as a measure under the Marine Strategy Framework Directive.</p> <p>Netherlands noise management, which considers noise limits on a case by case basis in addition to seasonal restrictions on construction. For example, the Borsselle wind farm had a Sound Exposure Level (SEL) limits of 160-172 dB re µPa² at 750m from the source as a function of the number of turbines and time of year of construction</p> <p>Information from scientific literature is available on appropriate noise thresholds for harbour porpoise for Permanent Threshold Shift (PTS), Temporary Threshold Shift (TTS) and disturbance.</p> <p>Exceeding noise thresholds has the potential to cause death, injury and disturbance. If these noise limits are exceeded therefore, this is likely to result</p>	<p>Whale and Dolphin Conservation Society</p>
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		<p>in the non-achievement of the conservation objectives for these sites, resulting in negative impacts on the Favourable Conservation Status of harbour porpoise, in breach of the Habitats Directive. We do not currently know enough about the functioning and population levels of harbour porpoise within these particular SACs. Therefore, the limits set out in this scientific literature should be used as a starting point for setting appropriate noise limits for the sites, but they will need to be adjusted downwards in view of this information gap, in order to comply with the precautionary principle embedded within Article 6 of the Habitats Directive.</p> <p>Another advantage of this approach is that it is possible to equate noise levels with habitat availability when deciding what an appropriate noise level limit should look like. The distance that noise levels are able to travel from the relevant noise source can be calculated and used to plot noise impacts. For example, in Germany it is assumed that if the 160 dB (SEL) threshold is complied with, measured at a distance of 750m, disturbance will occur within a radius of 8km. Plotting disturbance radiuses in this way means that it can be ensured that harbour porpoise have enough access to the SAC.</p> <p>The use of this approach in Germany and other European countries proves that the use of noise limits can be implemented and monitored. This is largely because: (i) overall noise level from source is a relatively easy parameter to measure and monitor for compliance with a noise level limit; and (ii) technology to reduce noise from pile driving and other construction activities already exists, meaning that noise limits can realistically be met while minimising the need to limit wind farm construction. By adding noise reduction into the tendering process this will encourage the industry to come up with newer and more innovative ideas. The noise limit has driven significant technological improvements in noise reduction in Germany. These improvements largely would not have happened without such a limit. As WWF's 2016 report, "A Positive Future for Porpoises and Renewables", shows, these reduction measures have significant benefits to harbour porpoise populations. Experience in Germany shows that this mitigation, as well as a stricter area threshold, allowed extensive offshore wind construction without reductions in porpoise detections or densities.</p>	
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<p>2.13. Effective Deterrent Ranges (EDRs)</p>	<p>21</p>	<p>Faulkner et al., 2018 is not included in the references, and includes helpful technical and policy information that argue against the approach in the guidance (section 4), such as:</p> <p>“We recommend that modelling the effect of noise abatement technologies [e.g. bubble curtains, alternative piling techniques] is required by regulators of noise-generating activities, so that regulators are informed of the risk reduction options available.”</p> <p>The type of mitigation used currently (observers, passive acoustics, soft starts) “have been criticised as arbitrary and evidence for their efficacy is lacking”.</p>	<p>Whale and Dolphin Conservation Society</p>
<p>2.9. Concern that as a result of the SNCB recommended approach there could be a population decline</p>	<p>22</p>	<p>Finally, we should not just try and preserve the current levels of populations. We must have ambition to restore populations – this is written into laws and conventions. For example:</p> <p>EU ‘Habitats Directive’ 1992 Article 1 (l) special area of conservation means a site of Community importance designated by the Member States through a statutory, administrative and/or contractual act where the necessary conservation measures are applied for the maintenance or restoration, at a favourable conservation status, of the natural habitats and/or the populations of the species for which the site is designated;</p> <p>Convention on Biological Diversity 1992 Article 8 Each Contracting Party shall, as far as possible and as appropriate: f) Rehabilitate and restore degraded ecosystems and promote the recovery of threatened species, inter alia, through the development and implementation of plans or other management strategies;</p> <p>Currently, the background document does not show any ambition either to restore porpoise populations to historic levels, or to even properly comply with current legislation to halt further declines. As they stand, we consider the background paper, and associated guidance is not fit for purpose, fails to comply with current legislation and is not ambitious enough in its purpose of protecting both individuals and populations of porpoise. It needs an urgent revision with a much higher conservation ambition, including statutory noise limits, built in.</p> <p>We therefore do not think use of these guidelines will lead to compliance of regulations. We would be happy to discuss our concerns further.</p>	<p>Whale and Dolphin Conservation Society</p>

2.14. Effective Deterrent Ranges (EDRs) 2.17. The use of Acoustic Deterrent Devices (ADDs)	23	“Use of ADDs introduces additional acoustic disturbance, and the extent of marine mammal displacement from ADDs may exceed the range of displacement from the activity itself if noise abatement measures are applied (Dähne et al., 2017). As such, use of ADDs should be considered carefully in the context of the proposed activity.”	Whale and Dolphin Conservation Society
General	NA	Unable to provide a response in the deadline but did share with W&D Conservation Society	Wildlife LINK
2.12. Activities/industries not covered by the guidance	24	Applicability to different industries – the introductory text states that the guidance applies to all plans and projects within or affecting a site that could cause significant noise disturbance to harbour porpoise. However, much of it if focused on offshore renewables or oil & gas industry activities, so it would be helpful to clarify whether other industries are also included in the scope of this approach, either because their activities have potential to cause significant disturbance alone, or (even though the noise levels are alone non-significant) in combination with other plans/projects.	The Crown Estate
Appendix 2: Implementation	25	It is our understanding that wording had been agreed for a draft site integrity plan condition between BEIS and the MMO about 18 months ago; however, the text indicates that SNCBs and regulators are still working on such a condition. It would be helpful if the guidance could include, if/when available, the agreed standard wording as this would help provide clarity for developers.	The Crown Estate
2.14. Effective Deterrent Ranges (EDRs)	26	References for where EDRs have been derived from are provided, but for clarity it would be useful if further detail is provided on what diameter piles and hammer energies etc are assumed for these EDRs (rather than individuals having to track back through numerous research papers) - presumably as technology changes the EDRs will also need to be kept under review and/or more suitable thresholds proposed.	The Crown Estate
Appendix 2: Implementation	27	Updating the evidence base - p6 states “there will need to be a periodic review (e.g. every 2 years) of the suitability of the proposed EDRs in light of new peer-reviewed evidence such as that gathered through construction monitoring conditions.” – perhaps more of a process/implementation matter, but it would be helpful to understand what sort of process is envisaged for the review, e.g. who will lead and coordinate, will it draw upon post consent monitoring data as well as R&D projects, how will the updated review/evidence base be made available.	The Crown Estate

2.10 The use of population consequences models to assess the potential for adverse effect on site integrity	28	An omission from the guidance seems to be any reference to the value of population modelling (e.g. Interim PCoD/Depons) as an alternative or supplementary approach to the application of the proposed thresholds, which the document recognises relies on assumptions and carries considerable uncertainty. There has been significant investment in these models, and it seems strange not to acknowledge them and their potential in this guidance. The background note does refer to models, but we believe there is still some merit in these models as contextual information on the health of populations at management unit level.	The Crown Estate
Appendix 2: Implementation	29	Given separate advice is being developed by SNH and NRW, this could have implications for strategic work e.g. SEA, plan-level HRA, or developments with transboundary impact footprints.	The Crown Estate
Appendix 2: Implementation	30	The recommendation is made for a periodic review as this approach beds in and the evidence base evolves, but it would be good to understand more about how this would work in practice. E.g. how will this be achieved (will it be ad hoc and up to industry, periodic review of the guidance, requests for new evidence at agreed dates) or will it be through strategic studies or specific work already planned to collate new evidence. Presumably a collaborative effort will be needed to ensure as a complete an evidence base is drawn upon, with applicability to all relevant industries and activities – we'd welcome discussion with you on whether there is any potential for a project under the offshore wind strategic enabling actions programme to add value to this review process/cycle.	The Crown Estate
2.14. Effective Deterrent Ranges (EDRs)	31	Recognising that an approach has been developed that needs to encompass a range of industries and activities potentially impacting the harbour porpoise SACs, we're aware that there has been some criticism by industry that the EDRs are too generic and precautionary. It would be helpful if future reviews and adaptation of the approach could build in metrics more attuned to taking into account project specific circumstances, potential for noise abatement techniques, mitigation, different physical and metocean conditions impacting on source noise and propagation. This would need to happen over time, and is dependent on the evidence base available, but in planning out a review/update process for the guidance the early identification of such metrics will be important as these can then be fed into relevant PCM and research projects and so the relevant, targeted evidence that we need gathered.	The Crown Estate
Appendix 2: Implementation	32	It is still not clear how it is envisaged that the SNCBs and different regulators administering different licensable activities anticipate being able to coordinate with each other in first of all issuing	The Crown Estate

		consent decisions but also reviewing post-consent monitoring data, and/or whether the onus will also be on individual developers (within an industry or even between industries) to try and coordinate amongst themselves. Further details on any progress made in stakeholders and regulators developing a way of working together on this would be helpful.	
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<p>2.12. Activities/industries not covered by the guidance</p>	<p>33</p>	<p>A consistent issue has always been that of ships' engine noise and how far this should be brought into the scope of EIA or Appropriate Assessment work. The guidance indicates that ships' engine noise is not a plan or project and clarification that this is the case would help resolve the issue and should lead to a standard response from regulators that ships' engine noise is screened out of future scoping work for developments. This is repeatedly stated in discussions, but would benefit if included in the final advice coming from Defra on subsea noise.</p>	<p>SUDG</p>
<p>2.12. Activities/industries not covered by the guidance</p>	<p>34</p>	<p>(p.2) The approach applies to all plans and projects within or affecting a site that could cause significant noise disturbance to harbour porpoise, alone or in combination with other plans or projects.</p> <p>(p.2) This guidance applies only to regulated activities and therefore excludes shipping.</p> <p>(p.2) ...and therefore excludes shallow water profiling techniques (some sub-bottom profilers and multi-beam sonars), which typically operate at higher frequencies.</p> <p>But the second and third points are then conflicted later on when the guidance states;</p> <p>(p.6) Sub-bottom profilers and other electromagnetic sources used in high-resolution geophysical surveys can be relatively loud sources with high duty cycles but, on the whole, highly directional with expected low levels of horizontal sound propagation. However, the potential disturbance effect of these sources is unknown as there are no empirical studies or measurements of sound propagated. We advise the use of a precautionary 5km deterrence radius until new evidence emerges.</p> <p>These activities are not regulated, and earlier on in the document were suggested to be excluded – but the inference is that they should be.</p>	<p>SUDG member</p>
<p>2.12. Activities/industries not covered by the guidance</p>	<p>35</p>	<p>I am not clear where other 'plans and projects' – such as marine aggregates – get factored in, given in isolation they won't have a significant effect, but in combination with other more substantial sources they may become the proverbial straw that breaks the camel's back. We have been here before with bird disturbance in SPAs. Have these activities been screened out? Have they even been considered? The document talks about 'all industries' but then clearly focuses on mainly one (offshore renewables) with a little bit of oil and gas thrown in.</p>	<p>SUDG member</p>
<p>Appendix 2: Implementation</p>	<p>36</p>	<p>We note that this consultation focuses on the evidence base for the draft SNCB guidance. Industry would value discussion and consultation on the proposed Implementation of the guidance</p>	<p>O&GUK</p>

		and a timeframe for the implementation, specifically we wish to understand the potential impact on proposed surveys in 2020 which are in the planning phase now.	
Appendix 2: Implementation	37	OGUK is supportive of a coherent network of marine protected areas and intentions to improve the protection of sensitive species, under the requirements of the UK Habitats directive and the Marine Strategy Framework Directive Programme of Measures. Given the low confidence in the evidence base (as acknowledged by the SNCB's) and as suggested previously, OGUK recommends that a trial of the threshold approach in the Guidance is carried out first at one SAC with suitable monitoring in-place. The trial should undergo periodic review and the results publish in peer reviewed paper(s) before widespread adoption of the Guidance.	O&GUK

<p>2.12. Activities/industries not covered by the guidance</p> <p>2.16.10Hz to 10 kHz frequency range</p>	<p>38</p>	<p>The Introduction is now explicit that the guidance excludes shipping (not a regulated activity) and equipment that uses high frequency (i.e. focus within 10Hz and 10kHz only) and therefore excludes shallow water profiling techniques (some sub-bottom profilers and multi-beam sonars).</p>	<p>Hartley Anderson</p>
<p>2.12. Activities/industries not covered by the guidance</p>	<p>39</p>	<p>OPRED also have concerns about other non-regulated activities that may have an impact but not captured under the guidance, such as geological surveys conducted for non oil and gas sectors, which are only have a voluntary notification process in place.</p>	<p>OPRED</p>
<p>2.12. Activities/industries not covered by the guidance</p>	<p>40</p>	<p>It is unclear why shipping noise is not considered as an activity that causes a loss of habitat within the SAC. The Habitats regulations apply to all activities and not just those that require a consent. There is good evidence that shipping can cause displacement of harbour porpoise and therefore shipping is a contributor to 'habitat loss' within the SAC and should be considered as part of the cumulative impacts in any calculations for thresholds.</p>	<p>OPRED (Genesis)</p>

<p>2.2. ASCOBANS conservation objective, carrying capacity and 20/10% thresholds</p> <p>2.4. Favourable Conservation Status and UK Marine Strategy Assessment</p>	<p>41</p>	<p>OPRED agree that this is necessary to highlight. Other areas of conservation (e.g. MSFD) have shied away from a definition of significant disturbance which demonstrates the split of expert opinion on this matter.</p> <p>OPRED note that much of what JNCC has used to justify their approach within their Guidance isn't consistent with the information provided within the MSFD documentation. A couple of points to highlight this are: <i>"The initial assessment concluded that the status is 'favourable' for the five most abundant cetacean species in UK waters:</i> <i>(i) harbour porpoise;</i> <i>(ii) bottlenose dolphin;</i> <i>(iii) white-beaked dolphin;</i> <i>(iv) fin whale; and</i> <i>(v) minke whale.</i> <i>The status of a further six species was unknown due to a lack of suitable abundance estimates. The remaining 17 species are considered rare or vagrant and therefore it was not possible to assess their conservation status in UK waters. There is no indication that at present, pressures are threatening or depleting these populations, although since these assessments, construction in the marine environment (e.g. in relation to renewable energy) has increased significantly."</i> and: <i>"The UK initial assessment for the MSFD published last year (http://cdr.eionet.europa.eu/gb/eu/msfd8910) based on the report "Charting Progress 2" (CP2, http://chartingprogress.defra.gov.uk/chapter-4-clean-safe-seas) was not able to provide a robust assessment of underwater noise and its impacts, and was not able to provide a baseline. CP2 concluded that there is currently insufficient evidence to provide a quantitative assessment of underwater noise.</i> <i>There is insufficient monitoring data to support an assessment of current ambient noise levels or their impact on marine animal populations. With respect to impulsive sounds; whilst a good scientific understanding exists with regard to noise levels that can cause physical harm, there is far less certainty about the levels of noise that are likely to cause negative behavioural impacts which could have an effect at a population level. The difficulty in setting thresholds for behavioural impacts is further complicated by the fact that behavioural change is very context specific. For example, animals may respond differently in prey-rich areas compared with prey-poor areas."</i></p>	<p>OPRED</p>
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2.16.10Hz to 10 kHz frequency range	42	We query the focus on frequencies between 10 Hz and 10 kHz as being the range most likely to result in disturbance. The functional hearing range of harbour porpoises stretches from >10kHz to ~160 kHz and the most sensitive range to over 100 kHz. We wish to highlight work undertaken by Kastelein in this respect as being more appropriate than the monitoring guidance referenced at present ¹ . The consequence of the present range will be to exclude sources likely to cause disturbance and include some that are unlikely to have any effect. The hearing sensitivity of harbour porpoises diminishes greatly below 10 kHz, so sounds of lower frequencies down to 10 Hz are very unlikely to elicit any response.	IAGC
Appendix 2: Implementation	43	Section 3.1, paragraph 3, footnote 4: – there is an acceptance that daily compliance is not practical. The retrospective compliance approach 'required' would not be legally enforceable and is therefore not something appropriate to add as a licence condition.	OPRED

<p>2.2. ASCOBANS conservation objective, carrying capacity and 20/10% thresholds</p>	<p>44</p>	<p>Initial Highlight Box – IAGC fundamentally disagrees with the application of the percentage area approach for temporary and transitory sound sources, and in particular for the 10% seasonal threshold. The percentage thresholds are acknowledged as having stemmed from ASCOBANS conservation objectives for populations relating to the maintenance/recovery of >80% carrying capacity in the long term, based on the threat of bycatch. This is noted as being a precautionary approach, and we query the scientific basis of applying the reciprocal percentage as being representative of true habitat loss.</p>	<p>IAGC</p>
<p>2.2. ASCOBANS conservation objective, carrying capacity and 20/10% thresholds</p>	<p>45</p>	<p>This is total speculation and seamlessly jumps from potential impacts on the carrying capacity of the overall management unit to a flawed concept of the carrying capacity of individual sites. It should all be deleted [from “The extent of habitat – to end of para]. See editorial comments version.</p>	<p>OPRED</p>
<p>2.2. ASCOBANS conservation objective, carrying capacity and 20/10% thresholds</p>	<p>46</p>	<p>As per previous comment, there is a jump from the carrying capacity of the management unit (here) to the application of it strictly to the site. The representation here is misleading as the ASCOBANS 80% metric includes use of the whole area that the management unit of the species covers. It therefore does not account for the fact that the individuals happily forage/utilise/range in areas out with the SAC also.</p>	<p>OPRED</p>
<p>2.2. ASCOBANS conservation objective, carrying capacity and 20/10% thresholds</p>	<p>47</p>	<p>The reason why this objective is not used in the Habitats Directive or in OSPAR is because, as an objective it is not a suitable or scientific way of transferring over an already precautionary figure of 80% which includes multiple species within a large management unit over to a smaller management unit for an individual species.</p> <p>This is a highly speculative assumption which needs to be adequately justified. This section is full of assumptions and proxies on which JNCC are expecting Regulators to make sensible recommendations. JNCC need to provide the degree of confidence that they have in all of these figures that they are quoting.</p>	<p>OPRED</p>

<p>2.6. Seasonal areas within the SACs</p>	<p>48</p>	<p>This assumption is fundamentally flawed as this means there is no one benthic area within the site that is more important than any other. Yet, the SNCBs have highlighted 'hotspots' from modelling as evidence to define the summer and winter areas of importance within some of the sites. Therefore, the evidence shows that there cannot be a linear relationship and so applying this number across the site, is incorrect. Furthermore, the evidence supporting the site designation shows that not only is there seasonal variability, but also intra-seasonal variability. This means that at any one time, even the usage of the hotspot areas will be differentially affected throughout that season.</p>	<p>OPRED</p>
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<p>2.1. Harbour porpoise feeding rates/needs and prey availability</p> <p>2.7. Risk that the approach to reduce the spatial footprint of noise within SACs may inadvertently increase the duration of the overall operations</p>	<p>49</p>	<p>Overall the approach is well presented and in most cases the evidence base is up to date.</p> <p>In section 3.2 <i>Definition of ‘significant portion of the site for a prescribed period of time’</i>, to make the case for the importance of loss of foraging opportunities, evidence is presented focusing on the high foraging rates and metabolic needs of the harbour porpoise. While in principle the argument is correct (i.e. due to its small size, harbour porpoise needs to feed regularly as opposed to relying on stored energy), a balanced and up-to-date evidence base should be used. The cited paper of Wisniewska et al. (2016) sparked a scientific discussion see Hoekendijk et al.(2018) and a response by Wisniewska et al (2018). All three papers should be referred to not just the first one. In addition, there are at least two more studies (Kastelein et al. 2019a,b) that provide new information relevant to the foraging needs of the harbour porpoise. These studies should be reflected as these results help to gain a more balanced appreciation of the likely physiological limitations and of the uncertainties involved. For example, Kastelein et al. 2019 concludes stating <i>“If food is abundantly available after a period of fasting due to a disturbance, wild harbour porpoises could eat a large percentage of their daily energetic requirement in one feeding bout to compensate for the period of fasting. However, little is known about the availability of food in areas that wild harbour porpoise may flee to or about their foraging behaviour when they are disturbed.”</i></p> <p>More concerning is that the evidence base is only used to support the current approach with little attempt to look at alternatives and/or at the possible consequences of what is being proposed. For example, there is a risk that the approach to reduce the spatial footprint relative to SACs may inadvertently increase the duration of the overall operations. But no evidence is brought to bear to suggest if one or either of these scenarios would allow <i>the site to contribute in the ‘best possible way to achieving FCS’</i>. Population consequences models such as DEPONS or iPCoD could provide insights in this respect if appropriate scenarios were compared (e.g. Nabe-Nielsen et al. 2018). [See Hartley Anderson response for details of references used].</p>	<p>Hartley Anderson</p>
<p>2.16.10Hz to 10 kHz frequency range</p>	<p>50</p>	<p>It would be useful to outline what sort of noise the harbour porpoise is responsive to i.e. Very high frequency.</p>	<p>OPRED</p>
<p>2.14. Effective Deterrent Ranges (EDRs)</p>	<p>51</p>	<p>An EDR of 26km is not appropriate for different pile diameters.</p>	<p>OPRED</p>

2.14. Effective Deterrent Ranges (EDRs)	52	It would make sense in that the variation due to the specific diameter of the pile and the duration that the piling was undertaken. If this is going to be used as evidence, then it should be clarified.	OPRED
2.15. Using 24 hours as the effect temporal footprint	53	This does not provide evidence that there is any effect, let alone, a significant one. I am not familiar with this source, but this paragraph is not clearly showing that any impacts were observed within a set distance and is not demonstrating whether there is habituation or return and how this influences the 'effect'. It states there is a 'response' but does not clarify whether at that distance, the 'response' is one of exclusion from the area. Return evidence has also been very weak throughout this document, which is a key consideration of whether the effect is significant or not because if an individual, returns to the area, it is not being excluded from the habitat. Whilst JNCC are advocating empirical evidence, this approach of theirs now appears to be based on modelled probability which is showing inconsistency in their approach to modelling?	
2.14. Effective Deterrent Ranges (EDRs)	54	What is the evidence that this activity is having an impact? Why is the 15km range chosen? There is no assessment/consideration of the limited duration of the activity or any return of the individuals. If this source is going to be used as a justification for an EDR of 15km then more information should to be provided. How confident are JNCC on the information provided within the reference.	OPRED
2.14. Effective Deterrent Ranges (EDRs)	55	Again, why have they suggested 5km? There is no evidence presented that these surveys are disturbing Harbour Porpoises. Indeed, discussion with JNCC have identified that unpublished (at the time) evidence in America was deemed to SBP are 'not an issue' and JNCC have suggested taking them out of the GS consenting process in any case. Setting a 5km precautionary threshold is totally at odds with those conversations.	OPRED
2.14. Effective Deterrent Ranges (EDRs)	56	How can JNCC recommend an EDR of 26km without any scientific basis?	OPRED
2.14. Effective Deterrent Ranges (EDRs)	57	The use of a 5km EDR may be stated as precautionary, but it is difficult to endorse a figure that has no evidence to back it up.	OPRED
2.14. Effective Deterrent Ranges (EDRs)	58	With no reference to base the UXO and other geophysical surveys it is difficult to endorse when there is no evidence to justify the EDR's. In addition, if there is no scientific basis for the recommended EDR then it should be not be used and removed from the table.	OPRED
2.14. Effective Deterrent Ranges (EDRs)	59	A noteworthy change from previous versions is that there are now several Effective Deterrent Ranges (Table 2) –this may be seen as an	Hartley Anderson

		<p>improvement (but also see comment on implementation below) and could do with further attention:</p> <ul style="list-style-type: none"> • Terms used to define 'Activity' need to be more explicit (e.g. does 'seismic survey' include boomer? what equipment is included in 'high resolution geophysical'). • The choice of distance is precautionary, i.e. max radius of the area where evidence of 'some' effect has been estimated; it does not equate to the radius of the area where all animals have been deterred from. • The basis for an EDR of 26km for an explosion is unclear. Typically, UXO clearance campaigns involve a single or few explosions in a day. They are therefore unlikely to have the same effect as a monopile installation in terms of deterring animals from the area or affecting their foraging opportunities. Since the publication of Southall et al. (2007), it is considered good practice to distinguish between activities generating single and repeated, multiple pulses. 	
2.14. Effective Deterrent Ranges (EDRs)	60	<p>The Effective Deterrent Radius (EDR) for seismic surveys is noted as being 10km, and as being based on the observations from a single study, which we do not believe to be reasonable. The majority of the output from a seismic source array is at frequencies well below the harbour porpoise hearing threshold and therefore, there is a need to weight hearing threshold accordingly. While reference is made to a potential need for an increased EDR for 3D seismic surveys due to increased array size, we do not anticipate this being required. The study in question did not note broad scale displacement, suggesting that habitat exclusion is not occurring, but rather short-term changes in acoustic behavior.</p>	IAGC
General	61	To note – section numbering is out e.g. 2 x 3.3 sections.	OPRED
	62	<p>This is a key point of the any evidence- What is the evidence to say stretching out the noisy timeline is better than allowing multiple activities to take place at the same time (seismic excluded as there needs to be a quiet background)? As remarked on earlier, the approach is extending the duration of chronic noise, rather than serving to reduce noise or to otherwise effectively manage noise.</p>	OPRED

<p>2.7. Risk that the approach to reduce the spatial footprint of noise within SACs may inadvertently increase the duration of the overall operations</p>	<p>63</p>	<p>The example given could result in extending the duration of the disturbance impact.</p>	<p>OPRED</p>
<p>2.7. Risk that the approach to reduce the spatial footprint of noise within SACs may inadvertently increase the duration of the overall operations</p>	<p>64</p>	<p>There has been no change to the seasonal approach which means the two separate winter areas within the Southern North Sea SAC continue to be accounted for as if they were a single area with no consideration of distance / connectivity and how animals moving to and from these areas may be affected by activity nearby. Make sure this is in implementation</p>	<p>Hartley Anderson</p>
<p>Appendix 2: Implementation</p>	<p>65</p>	<p>This has the potential to cause unsafe situations where there is no flexibility in surveys for weather down-time. If there is a regulatory 'pressure,' where applicants need to undertake the survey on set days that cannot be amended then this may have the unintended consequence of continuing work in to unacceptable weather conditions. To stop an activity and resume at a later date is a substantial commercial and financial outlay, potentially delaying a project by a full year with all the resulting consequences.</p>	<p>OPRED</p>

<p>2.15. Using 24 hours as the effect temporal footprint</p>	<p>66</p>	<p>As previously commented, IAGC feels that the application of the current seismic survey EDR of 10km along the entirety of the portion of a survey line, or series of lines that may be acquired in one day in the form of a buffer is inappropriate. As the seismic source is transient, any potential effect is also transient, and cannot be considered as having affected an area such as the example provided in any given 24-hour period.</p> <p>There is no empirical evidence to suggest that any short-term displacement of harbor porpoises would last 24 hours, nor any evidence to support the 10 km EDR, and therefore no justification for this approach.</p>	<p>IAGC</p>
<p>2.15. Using 24 hours as the effect temporal footprint</p>	<p>67</p>	<p>This is a significant concern. It is a departure from the way we have been assessing and JNCC agreeing previous AAs.</p> <p>Overall section 3.3.2 is poorly described and appears to have been added because JNCC felt that they had to put something in for seismic surveys. It is difficult to assess different sources of noise in the same way as they are generated in a completely different way and at different frequencies. It is noted that in the table the suggested EDR for seismic surveys should be a minimum of 10km and yet for sub-bottom surveys the recommendation is 5km.</p>	<p>OPRED</p>
<p>2.14. Effective Deterrent Ranges (EDRs)</p>	<p>68</p>	<p>The geophysical source calculation using EDR does make sense and the workings should be shown. Is the result assuming the total disturbance on that day is a cumulation of the disturbance that has taken place along the whole of that 16km line? The example is mis-leading, and it fails to account for the mobile nature of the sound source, line spacing, speed of vessel, line turns etc. In order to calculate area disturbance is much more complicated than the example presented (although without workings the methodology is not transparent). This is the crux of our argument that seismic is different. Furthermore, as HPs return after a day- a seasonal cumulative impact is irrelevant.</p> <p>Are JNCC assuming that the total disturbance on that day is a cumulation of the disturbance that has taken place along the whole of that 16km line. However, they are failing to appreciate the mobile nature of the source and that the EDR is constantly moving such that only that snapshot of an EDR is disturbing (in this case 314.2km²). Basically, it's saying that an ambulance significantly disturbs everything along its path for the entire duration of its journey to/from the hospital! This is the crux of our argument that seismic is different by being transient.</p>	<p>OPRED</p>

		Furthermore, as HPs return after a day- a seasonal cumulative impact is irrelevant as even if you did not account for the distance travelled in a day, on day 2, the area from day 1 is then available to the HPs again and is NOT still part of the cumulative seasonal assessment. The example given totally over-estimates what the real impact of disturbance could be by failing to account for the fact that the disturbance as a radius (or starburst as we have modelled) simply moves through the area, but does not affect that whole area at the same time.	
Appendix 2: Implementation	69	Applicants can only be asked to provide monitoring evidence if it relates to a need on the permit/consent itself. Whilst some may be willing to go over and above what is required by the consent, a regulator cannot ask for further evidence if it is not directly related to the consent	OPRED
2.14. Effective Deterrent Ranges (EDRs)	70	The guidance states <i>"It is recognised that the approach presented in this document is based on assumptions and carries with it considerable uncertainty"</i> , therefore, the guidance needs to demonstrate flexibility and to be consistent with those assumptions- i.e. that if modelling has been used to justify the EDRs (e.g. Pin pilling used 'modelled' response of harbour porpoises), then noise modelling should be acceptable for use also.	OPRED
2.2. ASCOBANS conservation objective, carrying capacity and 20/10% thresholds	71	The provision of the Background Document on the Advice on Noise Management within Harbour Porpoise SAC's in England, Wales and Northern Ireland (subsequently referred to as the 'Background document') is welcomed. However, several of the concerns raised by industry in 2019 on the evidence base used to support the proposed threshold approach remain un-answered. The Background document itself acknowledges "that It is recognised that there is low confidence in the evidence base for the guidance". It is noted that the evidence-base used for the threshold approach does not meet the SNCB's requirements set in the Guidance for suggesting future changes: robust peer-reviewed evidence.	O&GUK
2.14. Effective Deterrent Ranges (EDRs)	72	A paper on the potential impact of 3D seismic surveys on harbour porpoise has recently been published. This suggests a similar radius of detection (8-12 km) as the EDR quoted for seismic survey in the guidance: Sarconińska, J., Teilmann, J., Balle, J.D., van Beest, F.M., Delefosse, M. and Tougaard, J. (2020). Harbor Porpoise (<i>Phocoena phocoena</i>) Reaction to a 3D Seismic Airgun Survey in the North Sea. <i>Frontiers in Marine Science</i> , 6: 824.	OPRED (Genesis report)

<p>2.1. Harbour porpoise feeding rates/needs and prey availability</p> <p>2.2. ASCOBANS conservation objective, carrying capacity and 20/10% thresholds</p>	<p>73</p>	<p>There is a lot of discussion about cumulative impacts throughout the guidance and suggestion of not carrying out more than one noisy activity at the same time, to avoid signal interference. However, is there evidence or research out there that prove it is better to spread less noise out over a longer period of time, than to have a louder noise over a shorter period of time.</p> <p><i>The assumption in the proposed approach for noise management is, therefore, that disturbance of harbour porpoise will result in their deterrence from areas of habitat and consequently affect the carrying capacity of the site.</i> This assumption appears to be based on a limited number of carefully selected papers (i.e. just two: Wisniewska <i>et al.</i> 2016 and Tougaard <i>et al.</i> 2013). No evidence has been presented to support the underlying assumption of this approach, i.e. that temporary displacement from an area will cause a reduction in the harbour porpoise population. It is well documented that 'noisy activities' in the form of seismic surveys have been undertaken in the SAC for over the last 60 years. Between 2005 and 2014 on average over six seismic surveys a year were undertaken within the SAC with between 51 and 310 days of seismic per year. During the period that seismic surveys have been undertaken the harbour porpoise population has increased across the area. This suggests that the temporary displacement of harbour porpoise by noise from seismic surveys does not have any population level effect and therefore the proposed threshold approach is not a suitable method to determine adverse effects on site integrity.</p>	<p>OPRED (Genesis report)</p>
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<p>2.2. ASCOBANS conservation objective, carrying capacity and 20/10% thresholds</p>	<p>74</p>	<p>'For current purposes, it is assumed that a directly proportional relationship exists between loss of access to habitat and overall carrying capacity. Under the assumption of an even distribution of animals, if disturbance resulted in the habitat loss of 1% of the total area, the carrying capacity of the population would also decrease by 1%. Over some years the population would thus also decrease by 1%'</p> <p>Notwithstanding the lack of evidence to support this approach it also ignores strong evidence that the number of harbour porpoise displaced reduces the further from the noise source, i.e. there is a dose response to noise. Consequently, it is not appropriate to simply assume that for pile-driving there is the same level of habitat loss at 26 km as there is at 1 km. Furthermore, the proportion of 'habitat lost' decreases over time. For example, Graham et al. 2019 demonstrated that noise from pile-driving displaced only 50% of the harbour porpoises within 7.4 km of the pile-driving and that over time this reduced to 1.3 km and therefore to presume that there is 100% habitat loss over a given range is not supported by the evidence and is overly precautionary.</p>	<p>OPRED (Genesis report)</p>
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<p>2.2. ASCOBANS conservation objective, carrying capacity and 20/10% thresholds</p> <p>2.5. The interpretation of significant disturbance</p>	<p>75</p>	<p>Evidence is not presented in the Guidance or Background document that the temporary loss of habitat (in the case of seismic surveys where sound sources are mobile, then temporary loss could be for a matter of hours) results in significant disturbance. Again, it is recommended that a trial of this approach is carried out first with suitable monitoring in-place and periodic review before widespread adoption.</p> <p>The Guidance considers loss of habitat as a percentage of the SAC site only. Porpoises are a mobile species and able to freely move beyond the SAC boundary. Tougaard et al 2013 considered all available porpoise habitat area in the North Sea and concluded a < 2% impact on habitat loss and carrying capacity from two piling events occurring constantly (i.e. a permeant habitat loss).</p> <p>Furthermore, the analysis by the expert panel in Tougaard et al 2013 concluded that:</p> <ul style="list-style-type: none"> • “That the proposed level of activity may, based on our analyses and specified assumptions, have small but measurable population-level effects on harbour porpoise. However, the magnitude of these potential changes are almost certainly less significant than those related to other human and natural factors and are unlikely to affect the long-term viability of this species in the North Sea. • These are unlikely to threaten the long-term conservation status of this species • In other words, while animals may be temporarily redistributed in space in ways that may affect their individual vital rates and even trends in local population numbers and trends for short periods, the proposed activities are unlikely to have long-term population impacts across the broad areas of the North Sea” <p>The Background document itself acknowledges that “despite historical levels of noise [seismic surveys and UXO], the cetacean survey data collected over the last two decades showed the SACs to sustain higher persistent densities of harbour porpoise than other areas, suggesting that animals may cope with a certain level of disturbance whilst still favouring those areas”.</p> <p>It is unclear how the conclusion that disturbance associated with underwater sound results in population level effects has been drawn.</p> <p>Furthermore, the assertion in the Guidance that it recommends that ‘significant disturbance’ should, therefore, be interpreted as a reduction of range of the species within the site or a reduction in access to available habitat is not supported by a peer reviewed reference.</p> <p>As stated in the Background document, the Guidance also states that the intensity, duration</p>	<p>O&GUK</p>
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		and frequency of repetition of disturbance are important parameters. However, the temporary nature of the sound is not reflected in the approach advocated in the Guidance which defines a fixed 24-hour disturbance period and does not account for the mobile nature of seismic sources.	
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<p>2.2. ASCOBANS conservation objective, carrying capacity and 20/10% thresholds</p> <p>2.15. Using 24 hours as the effect temporal footprint</p>	<p>76</p>	<p>The basis of the guidance being the untested model detailed within the paper by Tougaard et al., 2013 is concerning. The premise that activities will lead to permanent habitat loss is not the case for temporary and transitory activities such as seismic surveys. The paper is focused on pile-driving activities, which are stated as occurring within the same place for long periods, potentially having a very different effect on the local environment when compared to geophysical survey activities of different types. Even then, the potential impacts are noted as being minor and unlikely to result in 'significant disturbance'. In considering our response, IAGC has worked with Oil and Gas UK (OGUK), who have also been involved with the consultation process since late 2019. We support many of the comments highlighted within their separately provided response, and in particular wish to highlight some of the points made within the 2013 paper by Tougaard et al. The analysis by the expert panel in Tougaard et al 2013 concluded that:</p> <ul style="list-style-type: none"> • <i>“That the proposed level of activity may, based on our analyses and specified assumptions, have small but measurable population-level effects on harbour porpoise. However, the magnitude of these potential changes is almost certainly less significant than those related to other human and natural factors and are unlikely to affect the long-term viability of this species in the North Sea.</i> • <i>These are unlikely to threaten the long-term conservation status of this species</i> • <i>In other words, while animals may be temporarily redistributed in space in ways that may affect their individual vital rates and even trends in local population numbers and trends for short periods, the proposed activities are unlikely to have long-term population impacts across the broad areas of the North Sea”</i> <p>The authors also acknowledge that <i>“despite historical levels of noise [seismic surveys and UXO], the cetacean survey data collected over the last two decades showed the SACs to sustain higher persistent densities of harbour porpoise than other areas, suggesting that animals may cope with a certain level of disturbance whilst still favouring those areas”.</i></p>	<p>IAGC</p>
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2.2. ASCOBANS conservation objective, carrying capacity and 20/10% thresholds	77	It is of concern that the basis of the Guidance, which is supposed to apply to all noisy activities (including seismic, uxo and piling) appears to be based on one paper (Touggard et al 2013) which bases the impacts on harbour porpoise from pile driving activities which have a very different source level, frequency range and noise propagation than that of seismic or uxo clearance operations. On this basis how is it possible to attribute this work to these activities.	OPRED
2.13. Strategic Monitoring	78	As acknowledged by the authors in Tougaard et al 2013, this is an untested model which assumes an even distribution of prey. This hypothesis should be tested with empirical evidence gathering and accompanied by suitable monitoring. It is recommended that a trial of the approach in the Guidance is carried out before widespread adoption.	O&GUK
2.2. ASCOBANS conservation objective, carrying capacity and 20/10% thresholds	79	The foundation of the SNCB advice is based upon the precautionary ASCOBANS interim conservation objective for a large-scale management unit for all small cetaceans which has been transposed to a much smaller scale, specific location for an individual cetacean species (the harbour porpoise). With what degree of confidence can the SNCBs justify this approach? The introduction of the advice that noise disturbance within the site does not exclude harbour porpoise from more than 20% of the site on any given day and to limit the area affected by disturbance seasonally, with no more than on average 10% of the SAC only serves to add even uncertainty in the confidence of the advice provided.	OPRED
2.2. ASCOBANS conservation objective, carrying capacity and 20/10% thresholds	80	<p>The 20% site area is extrapolated from the ASCOBANS3 conservation objective for small cetacean populations, i.e. recovery to and/or maintaining 80% of carrying capacity in the long term. The ASCOBANS3 was established in response “to the most significant threat to the small cetacean populations” (as stated by ASCOBANS) of bycatch.</p> <p>ASCOBANS3 is based on population numbers, mortality of individuals and not temporary disturbance or loss of habitat. Evidence is not presented that disturbance of individuals leads to their removal from the population and whether disturbance results in the same level of reduction in population as bycatch.</p> <p>Furthermore, ASCOBANS3 was created for small populations of porpoise in the Baltic Seas. No evidence is presented in the Background document or Guidance on the suitability of this threshold for disturbance from noise in UK SACs.</p> <p>It is recommended that a trial of the threshold approach is carried out to gather the evidence before this is adopted widely.</p>	O&GUK

2.2. ASCOBANS conservation objective, carrying capacity and 20/10% thresholds	81	The Background document and Guidance provide no evidence or publically reference peer reviewed sources for this assertion.	O&GUK
2.14. Effective Deterrent Ranges (EDRs)	82	It is noted that within the guidance the EDRs used are unreferenced and therefore have no scientific basis whatsoever. Surely the use of some sort of modelling is better than a figure that has been made up. In addition, it should be noted that the fixed EDRs that the SNCB advice favours may not be appropriate for the type of operation that is being undertaken and could therefore be completely inappropriate to use.	OPRED
2.14. Effective Deterrent Ranges (EDRs) 2.15. Using 24 hours as the effect temporal footprint	83	The Guidance focuses on an approach for static noise sources and advocates use of a fixed effective deterrent radius (EDR). This is an EDR of 10km simultaneously along the full length of the seismic survey and for a fixed 24-hour period. This does not reflect the mobile nature of seismic surveys and that noise is transient over the survey period. There is no empirical evidence sited in the Background document or the Guidance to suggest that any short-term displacement of harbour porpoises would last 24 hours. The EDR of 10km is derived from Thompson et al 2013 which utilised a ~ 500 cubic sources. The use of fixed pre-determine EDR in the Guidance does not allow for consideration of survey specific source or set-up. The addition in the Guidance of a fixed 5km EDR for high resolution geophysical surveys provides clarity however, as stated in the Guidance does not meet the standard for peer review evidence and regulation based on the lack of this is uncomfortable. It is suggested that any EDR for high resolution geophysical surveys should be based on empirical evidence.	
2.19. Advice for Scotland and Wales	84	SNCBs should be more transparent with regards to why the application of the Guidance was not applied in Scotland and Wales. It should be noted that the Scottish Government actually pulled out when the designations were under discussion, prior to sites being designated – before the guidance was developed and therefore the explanation regarding Scotland’s view can be construed as disingenuous.	OPRED
General – background document	85	For transparency it would be useful to highlight who was in attendance at specific meetings and what was discussed at these workshops. Presently, it can be misconstrued that all stakeholders were first engaged from Feb 2017, which is NOT the case. The July 2019 workshop was the first exposure of the guidelines for several of the organisations, not just O&G UK and this should be clearly described.	OPRED

General	86	It would have been beneficial if the feedback was also within Annex 2 to provide further transparency regarding the feedback, any amendments made to the guidance or views not considered. This provides added confidence that stakeholders views are being considered and a log of why views were not taken on board.	OPRED
2.2. ASCOBANS conservation objective, carrying capacity and 20/10% thresholds	87	The provision of the Background Document on the Advice on Noise Management within Harbour Porpoise SAC's in England, Wales and Northern Ireland (subsequently referred to as the 'Background document') is welcomed. However, several of the concerns raised by industry in 2019 on the evidence base used to support the proposed threshold approach remain un-answered. The Background document itself acknowledges "that It is recognised that there is low confidence in the evidence base for the guidance". It is noted that the evidence-base used for the threshold approach does not meet the SNCB's requirements set in the Guidance for suggesting future changes: robust peer-reviewed evidence.	O&GUK
2.12. Activities/industries not covered by the guidance 2.14. Effective Deterrent Ranges (EDRs)	88	On implementation, there is no improvement on previous versions. On the contrary, the use of different EDRs may have created an even greater requirement to account for all licensed activities in terms of their footprint - despite shipping being excluded even though its deterrent effect is well known. There also appears little incentive for industry to reduce sound emissions if the focus is only on the EDR; the footprint of one monopile is the same as that of 3 pin piles or 3 monopiles with abatement (with all the extra time and effort that these require).	Hartley Anderson
Appendix 2: Implementation	89	In practice, the risk of industry [oil and gas] exceeding the thresholds is relatively low. For improved environmental outcomes, implementation should focus on encouraging noise abatement rather than creating an overly complicated arrangement. A simpler approach would be to set an upper limit to the number of monopiles that can be installed at any one time without mitigation (one or two) while at the same time allowing any development that uses noise abatement with monopiles or any other foundation to go ahead. For balance between industries a maximum footprint for seismic surveys should also be defined, although there is no evidence to suggest exploration activity within porpoise SACs will increase over the next decade.	Hartley Anderson

<p>2.3. Not using a set SAC population size in HRA assessments</p> <p>2.19. Advice for Scotland and Wales</p>	<p>90</p>	<p>'as a mobile and wide-ranging species, density and abundance of harbour porpoise within the site varies considerably by season and year and it is therefore not appropriate or practical to aim to maintain a given harbour porpoise abundance in the site' Harbour porpoise are hardly unique in being mobile and far ranging species which show seasonal and across year population variations; most marine mammals and birds associated with SACs / SPAs fit this description and have been subject to assessment under the Habitats Regulations. It is unclear why this novel approach in determining adverse effects is required and if so, why it is only being proposed for harbour porpoise SACs located in England and Northern Ireland and is not being adopted in either Scotland or Wales. If the approach is not being adopted across the UK there has to be significant uncertainty over whether it is the most suitable way to assess impacts within harbour porpoise SACs.</p>	<p>OPRED (Genesis report)</p>
<p>Appendix 2: Implementation</p>	<p>91</p>	<p>Implementation of the guidance for HRA or EIA/permit consent is potentially very difficult, for example calculating cumulative impacts across a range of different possible applications (e.g. seismic survey versus piling), geographic locations and dates.</p> <ul style="list-style-type: none"> • Will a methodology be published for making the impact calculations in e.g. GIS? • Will a database be made available for proposed piling activities / seismic surveys with timings and assessments that have been undertaken so that a cumulative assessment can be made? <p>A consistent approach and database of assessment carried out would help to ensure that noise related activities remain within the limits that have been proposed..</p>	<p>OPRED (Genesis report)</p>
<p>Appendix 2: Implementation</p>	<p>92</p>	<p>The JNCC letter accompanying the guidance document describes the approach as being 'a pragmatic approach to managing underwater noise'. It would be good to understand how this pragmatism is going to manifest itself when determining whether projects can proceed. Recognising that, to date, assessments using this approach have been based on considerable amount of uncertainty in both the timing and the duration of their impacts. The assessments may have over-estimated either the proportion of the SAC that will be affected or the duration of the impacts or both. If this is the case, this will lead to future activities being unnecessarily delayed or cancelled due to incomplete or inaccurate information. To improve our understanding on the level of uncertainty regarding the temporal and spatial scale of predicted effects an assessment of the planned (consented) and actual level of impact from all consented activities undertaken within the SAC over the last few years could be</p>	<p>OPRED (Genesis report)</p>

		undertaken. This would improve our understanding of whether the proposed approach to managing noise is suitable and whether it significantly over/under-estimates the extent and duration of impacts.	
Appendix 2: Implementation	93	Will transboundary impacts be considered? For example, noisy activities in Dutch waters could cause an exceedance of the thresholds. How will this be managed?	OPRED (Genesis report)
Appendix 2: Implementation	94	<p>Projects looking to undertake activities within the SAC will aim to minimise project risk and submit applications with worst-case scenarios and extended dates with the aim of ensuring that there is no risk of having to re-apply for extensions to consented activities, which could be refused due to the exceedance of the arbitrary thresholds. How is this going to be managed?</p> <p>It is unclear how Defra propose to manage the daily and seasonal totals, when there will inevitably be considerable uncertainty as to what activities are being undertaken on a daily basis. This uncertainty poses a significant risk that activities relating to the construction of offshore energy projects could be either refused a consent, delayed or cancelled by the use of these thresholds. It is therefore critical that if this approach is taken forward that before doing so the uncertainties and concerns surrounding how all offshore activities are to be managed are fully resolved and that both industry and stakeholders are properly consulted.</p>	OPRED (Genesis report)
Appendix 2: Implementation	95	<p>Limited information is available on projects in other sectors to operators at the time of application for geological consent and individual operators do not have access to details of any limits or time constraints conditions placed in consents already granted to others. This information is only be held by the regulators.</p> <p>Any prioritisation of activities would therefore have to be carried out by the regulators post-application, and it is not clear at present how the various regulators could co-ordinate approvals within this framework. Furthermore, it is unclear who has ultimate decision-making power should two activities wish to coincide within the SAC.</p> <p>OGUK understands that the activity tracker is under development between regulators and recommends that this is made widely available to all operators and developers. This does not need to name the operator or developer but should outline the activity, scale of the activity and noise generation and any restrictions or thresholds imposed or noise mitigation measures.</p> <p>The area has the potential to support the new CCUS industry which will require geophysical surveys and drilling activities in future. There is also</p>	O&GUK

		a lot of decommissioning activity on going in the SNS which does require use of cutting and explosive equipment. Usually this work is coordinated by the contractor and will be carried out around other planned activities such as pipe-lay or wind farm installation.	
Appendix 2: Implementation	96	It is unclear from the Guidance, how the noise thresholds will be practically enforced across the sectors and by different regulators. The seasonal threshold applies over a season and over many different potential activities. It is unclear who from different developers/ operators would be held accountable for exceeding the threshold if individually remained in the limits set in their consents/ permits but the seasonal threshold was collectively exceeded and when enforcement action would be taken.	O&GUK
Appendix 2: Implementation	97	Understanding that this consultation is focused on the evidence base, the IAGC also wishes to highlight again the concerns regarding implementation of the proposed guidance. There are a number of significant practical limitations. Principally among these is the scheduling of 'competing' activities, where it is likely that the commencement of one activity may exclude others at any given time. We believe that it likely represents a competitive problem, both at a local level, and in terms of various anti-trust laws, by which seismic companies engaged in activities on the UKCS remain bound to their nation of incorporation. Activities that may be scheduled, such as seismic surveys, site surveys, construction piling and ordnance removal all have very different planning horizons which will be extremely hard to coordinate. It is understood from previous discussions that BEIS are developing a scheduling tool to aid the process, and IAGC looks forward to understanding more about this process and engaging further. We have previously raised concerns about the scheduling of activities during non-optimal seasons, which is an ongoing concern. Surveys conducted outside of favourable weather conditions are more costly, often result in greater levels of noise in the environment, and increase the risk of health, safety and environmental incidents. Compounded by additional scheduling windows being imposed, this may risk activities not taking place at all, which would do significant harm to the business confidence in those parts of the UKCS affected.	IAGC
Appendix 2: Implementation	98	The consenting process requirements and monitoring for noise generating activities varies between sectors. Geological consent in the oil and gas industry for seismic surveys are usually sought and granted in a timeframe of 28 days, while some other activities are consented years in	O&GUK

		<p>advance. The application of the threshold as proposed could result in a first-come first-served basis which, given these different timescales for projects and consents in the different sectors, could inadvertently create preferential treatment of certain activities.</p> <p>The specific timing of the seismic survey is not usually within the control of the oil and gas operator but is coordinated by the seismic contractor depending on vessel availability and a suitable weather window. These vessels do move in and out of the North Sea. All sectors will recognise the necessity of methodological flexibility to account for weather delays, and the uncertainties surrounding when activities will take place during the consented period.</p> <p>Delays in the consenting process for seismic surveys could impact drilling programme schedules and result in delay in production.</p> <p>Any challenge to survey consents based on the potential to exceed the noise threshold should be raised in the consenting process and not during operations which causes a delay in the surveys and increase in cost. This will require early planning and coordination across the regulators.</p> <p>Clarity on the timeframe for the implementation of the guidance would be welcomed to avoid potential significant disruption to planned survey activity for the summer 2020. These surveys are already on the planning phase.</p>	
Appendix 2: Implementation	99	<p>It would be very helpful to understand what the requirements / expectations are for monitoring:</p> <ul style="list-style-type: none"> o Effectiveness of any proposed management measures o Compliance with noise thresholds beyond the current practice of submission of close out reports to the noise registry <p>It would also be helpful if the monitoring plan for the site was shared by JNCC.</p>	O&GUK
Appendix 2: Implementation	100	<p>It is understood that the Special Areas of Conservation (SAC) designation is based on the site usability by harbour porpoise. EDF would welcome confirmation from JNCC on whether there is any ongoing or planned work to undertake studies on prey availability and prey distribution to determine habitat suitability over time. EDF would welcome clarity on how changes in prey availability and distribution, which will directly influence harbour porpoise distribution across Southern North Sea Special Areas of Conservation (SNS SAC), would be incorporated in the guidance.</p>	EDF

Appendix 2: Implementation	101	EDF would welcome clarity on how new data submitted to the new Joint Cetacean Data Programme will feed into potential updates of the Guidance for assessing the significance of noise disturbance against Conservation Objectives of harbour porpoise SACs.	EDF
2.12. Activities/industries not covered by the guidance 2.14. Effective Deterrent Ranges (EDRs)	102	There is currently limited knowledge on harbour porpoise recoverability after an event of noisy activity. Is there an additional precautionary margin built into the currently proposed Effective Deterrence Range (EDR) values and does the guidance anticipate the EDR reducing once further data are collected?	EDF
2.12. Activities/industries not covered by the guidance 2.14. Effective Deterrent Ranges (EDRs)	103	There is also limited knowledge on noise habituation, for example, an increased number of vessels during the construction period, deployment of Acoustic Deterrence Devices (ADD), and piling. Is this included as a further margin of precaution?	EDF
2.12. Activities/industries not covered by the guidance 2.16.10Hz to 10 kHz frequency range	104	The document outlines that the guidance only applies for noise within the frequencies 10Hz to 10kHz. This includes the dominant spectrum of piling energy, but excludes all geophysical survey activities, apart from sub bottom profilers (such as parametric profilers, pingers, chirps, sparkers and boomers) and air gun / water gun (very rarely used in offshore wind). EDF's expectation is that the guidance is also applicable to other sectors so we would appreciate a further review of the range of frequencies	EDF
2.14. Effective Deterrent Ranges (EDRs)	105	It is important to recognise that the guidance captures industries with radically different noise sources. Where the offshore wind industry uses sources to describe soil profiles down to maximum 80-100m below seabed with the primary focus on upper 30-40m below seabed, the oil and gas industry uses high powered equipment to reach depths of 6,000m below seabed. The guideline mentions a 470 cubic inch air gun for oil and gas seismic surveys. If air guns are used, albeit very rarely in offshore wind, it is in the range of 15-20 cubic inch. The most powerful equipment used by the offshore wind industry we use is a sparker (sub-bottom profiler) with energy output of 400-800 joule per shot. There is no straight-forward comparison between the output from a sparker and the 470 cubic inch air gun, but the differences in target depth below seabed is very indicative of the differences in output levels for the two systems. There is also an important difference in the low frequencies, 10-100 Hz, applied in oil and gas which travels much further in the water column than the high frequencies (1,000-4,000 Hz) applied in offshore wind equipment. EDF believes that it would be better to list the EDR values for seismic	EDF

		<p>and high resolution geophysical surveys according to the noise source strength and frequencies.</p> <p>The noise sources used in offshore wind are very directional, which is not always the case with air gun surveys for oil and gas surveys, for which there is noise "pollution" in several directions. Therefore, the impact ranges are extremely narrow in offshore wind and it is appropriate to use separate EDR values accounting for this to avoid headroom "lost" without any reason. There have been recent measurements on sub-bottom profilers (both sparker and parametric profiler) in the USA, with resulting behavioural deterrent ranges ("Level B" harassment, 160 dB μPa SPLrms90%) of <5m for the parametric sub-bottom profiler and <20m for the sparker sub-bottom profiler. Given this, the 5-10km EDR appears to be excessive. A realistic offshore wind sub-bottom profiler campaign has 75-line km per day (not 16km as used in example in the guideline), which results in a disturbed area of 0.4-3.0km per day.</p>	
2.16.10Hz to 10 kHz frequency range	106	<p>It is stated that 10Hz to 10kHz is the spectrum that the guidelines are applicable to. EDF would welcome confirmation on, and specification for, the EDR geophysical section and table 2, where it is only this frequency spectrum that is relevant to consider, along with clarification of the underlying to the reasoning. It would be particularly helpful if a link to relevant literature/studies could be provided.</p>	EDF
2.14. Effective Deterrent Ranges (EDRs)	107	<p>EDF believes it would be good to base the values numbers on a more project specific assessment than the generic "15km" for monopiles with noise mitigation systems in place currently proposed. It is clear, that different foundation dimensions, site characteristics, installation approaches and use of specific noise mitigation systems, will result in different EDR. The EDR should be based on a modelled number incorporating the project specific situation. EDF would welcome further discussion on an approach for this.</p>	EDF
2.14. Effective Deterrent Ranges (EDRs)	108	<p>It appears that for piled jackets, the EDR is also 15km but without noise mitigation systems. EDF would welcome clarification whether this is the intended basis. If the above comment on a modelling approach cannot be met, then EDF would like to see an EDR specified for piled jackets with a noise mitigation system.</p> <p>A precautionary 15km EDR (see page 6) is recommended within the guidance for piling (monopiles) with noise abatement systems, EDF would welcome clarity on what noise abatement system is assumed in this recommendation.</p> <p>A 15km EDR is recommended for pin pile driving events (see page 6) in the guidance. EDF would welcome clarity on whether a noise abatement</p>	EDF

		<p>system is assumed to be deployed in this case and, if not, what EDR would JNCC recommend if noise abatement systems are used during pin pile driving?</p> <p>EDF would welcome clarity on the extent to which 'as-built' survey data using actual hammer energy will be used to refine the EDR. If the EDR is based on maximum consented hammer energies or UXO detonations only, EDF is concerned that this could lead to an over-precautionary assessment for cumulative impact assessments.</p> <p>A 26km range is proposed, as "these detonations are usually part of campaigns with potentially several detonations in the same general area over several days." It would be useful to clarify when a campaign falls in the category of "several detonations... over several days" (e.g. how many? what sizes? what duration?). The guidance also recognizes that individual / few explosions do not cause an effect. Optimally, this range should also be based on a modelled approach for the individual campaigns (UXO sizes varies). As a result, EDF would encourage further work in this area.</p>	
<p>2.1. Harbour porpoise feeding rates/needs and prey availability</p> <p>2.2. ASCOBANS conservation objective, carrying capacity and 20/10% thresholds</p>	109	<p>It is critical to understand the prey availability reference within the document as it is such a key parameter of the principles of the guidance. The Sea Mammal Research Unit (SMRU) has carried out some work which demonstrates that, in practice, there are no places in the North Sea where there is not sufficient prey availability for porpoises. Furthermore, there is evidence of more than sufficient available prey and, SMRU argue that displacement will not negatively affect foraging effects, although energy expenditure of fleeing, being stressed or competing for other reasons such as courtship, may still occur.</p> <p>The guidance states that "for current purposes, it is assumed that a directly proportional relationship exists between loss of access to habitat and overall carrying capacity." Based on the SMRU study, it appears that such a "directly proportional relationship" does not exist. The ASCOBANS 80% carrying capacity number (which the 20% JNCC threshold is derived from) is developed in relation to bycatch, where there is a direct relationship between activity (bycatch) and population size. In contrast, disturbance from piling does not cause such a direct relationship. EDF would like to see a further review of the SMRU work and the guidance updated accordingly.</p>	EDF
Appendix 2: Implementation	110	We also note that the guidance, being focused on wind farm construction, does not include near shore construction activities such as harbour or power station related works. The examples within	Energy UK

		<p>the guidance suggest that the area lost to porpoise from the installation of a small number of wind turbine masts would exceed the proposed 20% daily or 10% seasonal loss of habitat in a SAC potentially preventing near shore construction if these near shore activities were included within the in-combination assessment. We suggest that the guidance addresses these construction activities possibly by introducing a threshold below which activities are deemed not to be significant in terms of impact on harbour porpoise.</p>	
<p>2.1. Harbour porpoise feeding rates/needs and prey availability</p> <p>2.2. ASCOBANS conservation objective, carrying capacity and 20/10% thresholds</p>	111	<p>Prey availability</p> <ul style="list-style-type: none"> ▪ It is understood that the SAC designation is based on the site usability by harbour porpoise. We would appreciate confirmation from JNCC if there is any ongoing or planned work to undertake studies on prey availability and prey distribution to determine habitat suitability over time. We would welcome clarity on how changes in prey availability and distribution, which will directly influence harbour porpoise distribution across Southern North Sea (SNS) SAC, would be incorporated into the guidance. ▪ It is critical to understand the prey availability reference as it is such a key parameter of the principles of the guideline. SMRU has done some work that demonstrates that there are basically no places in the North Sea, where there is insufficient prey availability for porpoises. (i.e. arguing that displacement will not negatively affect foraging effects, though energy expenditure of fleeing, being stressed or competing for other reasons, e.g. courtship, may still occur). The guidance states that <i>“For current purposes, it is assumed that a directly proportional relationship exists between loss of access to habitat and overall carrying capacity.”</i> ▪ Based on the SMRU study, it appears that such “directly proportional relationship” does not exist. The ASCOBANS 80% carrying capacity number (where the 20% JNCC threshold comes from) is developed in relation to bycatch, where there is such direct relationship between activity (bycatch) and population size; contrary, disturbance from piling does not cause such direct relationship. We would like to see a further review of the SMRU work and the guidance updated accordingly. 	Energy UK
2.18. Acoustic Fish Deterrents (AFDs)	112	<p>Energy UK acknowledges the pragmatism of the approach being proposed. We note that some generation sites operate Acoustic Fish Deterrent (AFD) systems which introduce noise into the marine environment in order to deter fish from entering cooling water intakes. The scale of the area around the intake from which fish are excluded, and hence lost to porpoise feeding, is small compared to the exclusion zones being proposed for windfarm construction activities. By deterring fish from entering the intake the AFD systems help retain fish in the sea so a potential</p>	Energy UK

		porpoise food resource is not lost. We suggest that because of the beneficial intent of these systems they are explicitly excluded from requiring assessment.	
2.14. Effective Deterrent Ranges (EDRs)	113	<p>Noise Abatement Systems</p> <ul style="list-style-type: none"> ▪ For piling (monopiles) with noise abatement systems, JNCC recommends a precautionary 15km EDR (page 6). We would welcome clarity on what noise abatement system is JNCC referring to in this sentence. ▪ JNCC also recommends 15km EDR for pin pile driving events (page 6). We would welcome clarity on whether a noise abatement system is deployed in this case and in which case, what EDR would JNCC recommend if noise abatement systems were used during pin pile driving? <p>Effective Deterrent Radius (EDR) geophysical surveys:</p> <ul style="list-style-type: none"> ▪ It is important to recognize that the guideline captures industries with radical different noise sources. Where the offshore wind industry uses sources to describe soil profiles down to maximum 80-100m below seabed with the primary focus on upper 30-40 m below seabed, the oil and gas industry uses high powered equipment to reach depths of 6,000m below seabed. The guideline mentions a 470 cubic inch airgun for oil and gas seismic surveys. If airguns are used (very rarely) in offshore wind, it is in the range of 15-20 cubic inch. The most powerful equipment offshore wind uses is a sparker (sub-bottom profiler) with energy output of 400-800 joule per shot. ▪ There is no straight-forward comparison between the output from a sparker and the 470 cubic inch airgun, but the differences in target depth below seabed is very indicative of the differences in output levels for the two systems. ▪ There is also an important difference in the low frequencies (10-100 Hz) applied in oil and gas travels much further in the water column than the high frequencies (1,000-4,000 Hz) applied in offshore wind equipment. ▪ It would be better to list the EDR values for seismic and high-resolution geophysical surveys according to the noise source strength and frequencies, and not generically as the less powerful equipment available are otherwise becoming victims of the very powerful equipment used by some industries and not others <p>Effective Deterrent Radius (EDR) foundations:</p> <ul style="list-style-type: none"> ▪ We consider that it would be good to base the numbers on something other than a generic “15km” for monopiles with noise mitigation systems in place. It is clear, that different foundation dimensions, site characteristics, installation approaches and use of specific noise mitigation systems, will result in different EDR. 	Energy UK

		<p>The EDR should be based on a modelled number incorporating the project specific situation. We would welcome further discussion on an approach for this.</p> <ul style="list-style-type: none"> It appears that for piled jackets, the EDR is also 15km but without noise mitigation systems. We would welcome clarification to this approach. If the above comment on modelling approach cannot be met, we would like to see an EDR for piled jackets with noise mitigation system. <p>Effective Deterrent Radius (EDR) UXOs:</p> <ul style="list-style-type: none"> A 26km range is proposed, as “<i>these detonations are usually part of campaigns with potentially several detonations in the same general area over several days.</i>” It would be useful to clarify when a campaign falls in the category of “<i>several detonations... over several days.</i>” (i.e. how many, what sizes, what duration), as the guidance also recognises that individual/few explosions does not cause an effect. Optimally, this range should also be based on a modelled approach for the individual campaigns (UXO sizes varies). We would encourage further work in this area. We would welcome clarity on the extent to which ‘as-built’ survey data using actual hammer energy will be used to refine the EDR. If the EDR is based on maximum consented hammer energies or UXO detonations only, we are concerned that this could lead to over-precaution for cumulative impact assessments. 	
<p>2.12. Activities/industries not covered by the guidance</p> <p>2.13. Strategic Monitoring</p> <p>2.14. Effective Deterrent Ranges (EDRs)</p>	114	<p>Knowledge gaps</p> <ul style="list-style-type: none"> There is currently limited knowledge on harbour porpoise recoverability after an event of noisy activity. Is this layer of precaution built into the EDR and does the guidance anticipate the EDR reducing once further data are collected? There is also limited knowledge on noise habituation (i.e. increase number of vessels during construction period, deployment of ADDs, and piling). Is this also included as a layer of precaution? Furthermore, we would welcome clarity on how new data submitted to the new Joint Cetacean Data Programme feed into potential updates of the Guidance for assessing the significance of noise disturbance against Conservation Objectives of harbour porpoise SACs. 	Energy UK
2.14. Effective Deterrent Ranges (EDRs)	115	<p>The noise sources used in offshore wind are very directional, which is not always the case with air gun surveys for oil and gas surveys; i.e. with noise “pollution” in several directions. The impact ranges are therefore extremely narrow in offshore wind and as such it seems fair to use separate EDR values accounting for this to avoid headroom being “lost” without any real reason. There have</p>	Energy UK

		<p>been recent measurements on sub-bottom profilers (both sparker and parametric profiler) in the USA, with resulting behavioral deterrent ranges (“Level B” harassment, 160 dB μPa SPLrms90%) of <5m for the parametric sub-bottom profiler and <20m for the sparker sub-bottom profiler; the 5-10km EDR thus seems quite excessive. A realistic offshore wind sub-bottom profiler campaign has 75-line km per day (not 16km as used in example in the guideline), which results in a disturbed area of 0.4-3.0km per day. If JNCC are interested, we can try to obtain the US reports on this work.</p>	
2.16.10Hz to 10 kHz frequency range	116	<p>It is mentioned that the guidance only applies for noise within the frequencies 10Hz to 10kHz. That includes the dominant spectrum of piling energy but excludes all geophysical survey activities apart from sub-bottom profilers (such as parametric profilers, pingers, chirps, sparkers and boomers), air gun/water gun (very rarely used in offshore wind). Our expectation is that the guidance is also applicable to other sectors and would appreciate a further review of the frequencies. We would appreciate if it could be confirmed and specified for the EDR geophysical section and for Table 2, that it is only this frequency spectrum that is relevant to consider and provide clarification to the reasoning (e.g. provide a link to relevant literature/studies).</p>	Energy UK
Appendix 2: Implementation	117	<p>Stakeholder engagement</p> <p>The guidance sets out the proposed approach for a 2-stage process: under the Habitats Regulation Assessment (HRA) as part of a Development Consent Order (DCO) application for an offshore wind farm, and then again under the Deemed Marine Licence (DML) condition which includes changes based on what is known about the project design at that stage. Given that this approach is consistent with the approach taken under the ongoing Review of Consent (RoC) for the Southern North Sea SCI/cSAC and the Site Integrity Plan (SIP), it would be appropriate to wait for the outcomes of these key legislative processes before finalising the wording within this guidance. Consultation comments on the draft HRA and SIP marine licence condition are being reviewed by the MMO and BEIS with the expectation that these documents will be finalised in the coming months. The guidance is currently badged as SNCB guidance, but it is unclear whether this guidance is supported by the MMO and BEIS, as the key regulators. Therefore, it would be useful if their input into the document could be confirmed.</p> <p>Planning of noisy activities between developers within the wind industry and with other industries requires careful consideration (see also, in-</p>	Renewables UK

		<p>combination assessments below). The guidance suggests that if a plan or project has been consented (which could cause noise disturbance up to the allowable maximum daily threshold) then no other noise disturbance should be allowed to take place unless they can be scheduled to occur during days when no other noisy activities are planned (whilst also ensuring the seasonal threshold is not exceeded). The guidance notes that industries with relevant plans or projects requiring HRA should be encouraged to contribute to evidence gathering to inform such evaluations, however clarity is needed on how activities from other sectors or noise emitters will be controlled and monitored. Industry would also welcome clarity on how up to date information from other industries could be shared using a possible tool for cross-sector notification. The information at present is not adaptable as projects change and is not in a format that is readily adaptable to the SAC process. There would need to be clear methods for monitoring set up, following the same standards, so that data collected is comparable and verified.</p> <p>Specifically, it is unclear how the Oil and Gas sector are captured within this approach. Given the consenting risk offshore wind projects could face as a result of differing submission and approval timelines between sectors, and the consequent impact on in-combination assessments, an understanding of how different sectors approach noise monitoring will be key. RenewableUK has written to OPRED to request sight of the guidance they have produced on the Oil and Gas industry's approach to managing underwater noise, to help the offshore wind industry better understand the types of management measures that may be expected in the future across both industries. We note that OPRED have not adopted the SNCB guidance, due to a number of outstanding concerns including the scientific robustness of the proposed threshold approach; its application for a highly wide-ranging mobile species; its implementation and subsequent enforcement.</p>	
Appendix 2: Implementation	118	<p><i>Cumulative effects and in-combination assessments</i></p> <p>Clarity in the requirements for underwater noise modelling techniques (given the variability in models used and their outputs) will not only be important for in-combination effects with other industries but also for assessing the cumulative effects of other wind farms. A clear approach will need to be agreed and communicated to industry and stakeholders. Careful consideration will be required for managing cumulative effects during project construction as there could be significant implications to adjacent projects. Industry raises the following questions:</p>	Renewables UK

		<ul style="list-style-type: none"> ▪ What would happen if one project carries out an activity that exceeds the area/time thresholds for subsea noise? ▪ How will daily thresholds be monitored by industry or regulators? ▪ Example provided in section 3.31 – does this mean that any other activity within the area would be prohibited? If so, how would this be managed and monitored? ▪ How will in-combination thresholds be managed in real life pre-construction and construction phases of offshore wind farm development? How far in advance will potentially noisy activities be assigned to projects and what will happen if a project does not utilize the allowed threshold in the time allocated to it? ▪ What types of survey device need to be considered for in-combination assessments in an HRA? Most offshore wind farm geophysical surveys, even those incorporating sub-bottom profilers are unlikely to have an EDR of more than a few meters. <p>Managing noisy activities across projects will require careful collaboration between sites and flexibility will need to be included for delays. If there are delays outside those expected, then this could lead to serious implications to multiple projects in terms of costs and programme. There may also be other projects in the vicinity that could result in noisy activities unknown at the time of planning to the individual projects. Even during the design stage there may be little knowledge of when surveys or other noisy activities may be undertaken by other wind farm developers or other industries. Given the issues which could arise, industry would welcome clarity on how the MMO decision-making process will apply to two parallel applications or projects.</p>	
Appendix 2: Implementation	119	<p><i>Timescales, design and spatial planning</i></p> <p>Developers need flexibility within a project schedule to manage delays and design changes, however the guidance does not reflect the ability of industry to commit to timescales or design. There needs to be consideration of time for developers to design a wind farm, time for regulators to approve a management plan, and time for any mitigation or management to be adopted. Key impacts to industry timescales include:</p> <ul style="list-style-type: none"> ▪ Contract for Difference (CfD) construction deadlines – developers must meet these deadlines which impacts when activities are scheduled, makes it hard to make changes, and raises management challenges for in-combination effects of projects ▪ Unforeseen delays at the time of HRA – e.g. additional UXO are found and a geophysical 	Renewables UK

		<p>survey is required, yet there is no formal and workable directory of these plans</p> <ul style="list-style-type: none"> ▪ Other delays – e.g. vessel availability or weather downtime <p>To mitigate difficulties with scheduling, developers require an envelope to allow for delays to be managed. To allow other applications to be determined however, industry would welcome a mechanism to facilitate giving back the envelope or headroom once works have started or been refined. This would assume that in giving back the headroom, the project should not need to then reconsider their cumulative assessment for any subsequent applications. Other temporal issues include:</p> <ul style="list-style-type: none"> ▪ Understanding the proposed approach at an operational level – for instance, sequencing of piling is set post-consent, with approval of the piling schedule approved 1-2 years ahead of construction. Foundation types are considered during the design phase and as a major feature of the wind farm design cannot be changed last minute ▪ Seasonal restrictions – piling and UXO in winter raises H&S concerns, particularly for projects located far offshore. Contrary to suggestions within the guidance, conducting surveys during sub-optimal times of the year (in terms of weather windows) is problematic due to the reduction in available operational time, exposure to poor weather (which increases risk to vessel crews and the environment) and can lead to an increased level of noise compared to conducting surveys in optimal conditions ▪ Retrospective compliance monitoring – industry has concerns over making use of data to assess whether regulatory processes are being effective in keeping noise below the advised area or time thresholds (e.g. using the Marine Noise registry), as this may not facilitate timely monitoring ▪ Scheduling – what happens if noise making activities take longer than planned? (i.e. how will the approach take account of possible delays e.g. adverse weather conditions or unexpected geological impacts?) How far in advance of the noise making activities will a developer or surveyor have surety of whether their activities may take place? ▪ Over-precaution – the possibility of delays pushes industry to be precautionary to ensure works can be completed. If works are then completed early is there a mechanism for releasing the allocation? <p>The point at which management and mitigation measures specified in the guidance are not an option for a project requires further clarity. The guidance includes spatial planning/phasing</p>	
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		(adaptive management, discussed below), alternative foundations (at which there is a point where they would not be viable), alternative methods of installation (certainty of use is variable) and sound mitigation at source (EDR, discussed below).	
Appendix 2: Implementation	120	<p><i>Adaptive management.</i> As new evidence becomes available through monitoring, the intention is that best practice noise mitigation can be updated, allowing management to be adaptive. Industry supports this approach but would welcome greater clarity on what this process would look like and how this would work in practice, including:</p> <ul style="list-style-type: none"> ▪ Is there a set period for review? Is there provision somewhere for standardising data or specifying the need or format? ▪ At what point within a project lifecycle would a developer be required to start considering new evidence? Developers with approved plans (i.e. with pre-construction documents signed off) should not be required to retrospectively re-assess at sight of any new evidence. Applying adaptive management during the construction stage, for instance, may not be practicable. It will therefore be important to identify when further changes cannot be made. ▪ How will the in-combination effect be managed? i.e. how will 'new' projects that come forward in the interim be managed, in a way to ensure enough headroom remains for the project awaiting confirmation via SIP? ▪ How will the ability of projects to refine the project design or timescale post- HRA/pre-SIP- be taken into consideration? Projects have an in-built 'headroom' capacity at application HRA – how will that capacity be traded and managed? Can a project retain unneeded headroom, or conversely can headroom be returned to the overall available capacity? Can such headroom be traded between developers or projects? ▪ How will activities not included in the DCO (e.g. UXO clearance or survey work) be assured of the availability of headroom? ▪ How can unforeseen factors requiring rapid resolution be included – e.g. when additional UXO are located which will then require a geophysical survey? 	Renewables UK
2.14. Effective Deterrent Ranges (EDRs)	121	<p><i>Effective Deterrent Radius (EDR):</i> Industry welcomes the acknowledgment within the guidance that there is opportunity to consider other EDR with evidence and that deterrence distances are likely to vary on a case by case basis. However, the current lack of evidence behind EDR development needs to be agreed and recognised in the guidance – for instance, different UXO detonations have different potential EDR's and this should be noted to prevent the</p>	Renewables UK

		<p>adoption of a default assumption. Industry raises the following questions:</p> <ul style="list-style-type: none"> ▪ How will an EDR work for a mobile source of sound? Would a single point of a defined EDR be used or a cumulative footprint? ▪ What EDR is appropriate for an offshore wind farm survey? Disturbance arising from geophysical activities will not cover the full extent of the 16km area for the entirety of the day. Further input from other industries or monitoring is required to ascertain if this is an accurate reflection of what the EDR is and how long it stays in place for when the survey vessel has moved beyond the 10km range². ▪ What level of evidence would be required to modify an EDR? Would site specific information be required or would a more standard approach per EDR or mitigation method apply? 	
Appendix 2: Implementation	122	JNCC guidance on injury risk – the current guidance is dated (particularly for piling and UXO) and is not relevant to the type of survey typical for offshore wind farms. Industry would welcome updated guidance, that takes account of updated thresholds, measured range of PTS risk, updated use of ADDs, shift in impulsive to non-impulsive over distance, and the ecological consequence of PTS	Renewables UK
2.1. Harbour porpoise feeding rates/needs and prey availability	123	Significance of disturbance (e.g. Wisniewska <i>et al.</i> , 2016) – SMRU draws on the discussion within their scientific literature and the significance of disturbance to individual animals ³	Renewables UK
2.2. ASCOBANS conservation objective, carrying capacity and 20/10% thresholds	124	Density maps of harbour porpoise across the North Sea – population and prey distribution change over time. How will such changes be incorporated into the management of the SACs?	Renewables UK
2.14. Effective Deterrent Ranges (EDRs)	125	The guidance should recognise that the approach will not apply solely to monopiles but also to other piles (e.g. pin piles)	Renewables UK
Appendix 2: Implementation	126	The guidance recommends that careful planning is required within the HRA process to ensure that the threshold of 20% is not exceeded – it is important to note that this is via the Marine Licencing regime rather than planning and would need to be associated with the marine licence condition control (N.B. this does not include geophysical surveys and UXO)	Renewables UK
Appendix 2: Implementation	127	Depending on ground conditions, more ‘noisy’ techniques may be required if alternative methods fail during implementation – e.g. during piling, a conventional hammer will be used as a back-up should vibropiling be unsuccessful. Consequently, developers always need to assess the worst-case scenario which directly impacts the noise threshold	Renewables UK

<p>2.19. Advice for Scotland and Wales</p>	<p>128</p>	<p>Marine Scotland received the consultation documents on the JNCC noise guidance. We were not intending to submit a formal response as the Scottish position is correctly recorded in the documents and our position has not changed.</p> <p>In terms of progress on managing noise with offshore wind, this is done in Scotland on a case by case basis, with the current focus on reducing the risk of injury through the use of ADDs, PAM and soft start. We will continue to consider abatement techniques (such as bubble curtains and deflagration for UXO clearance) as evidence of their effectiveness in deeper Scottish waters becomes available. To date SNH have not raised any objection to any offshore wind farm activity in relation to underwater noise.</p> <p>In addition the next wind farm projects which are scheduled to start construction in Scottish waters will be using alternatives to impact piling during installation. Neart na Gaoithe wind farm will be drilling, and Seagreen phase 1 will be using mainly suction buckets, therefore underwater noise for these projects will be greatly reduced from the worst case that was assessed within the EIA Reports.</p>	<p>Marine Scotland</p>
<p>2.14. Effective Deterrent Ranges (EDRs)</p> <p>2.19. Advice for Scotland and Wales</p>	<p>129</p>	<p>NRW has not signed up to this guidance to retain some flexibility in approaches to the management of noise. Therefore, NRW does not consider that this guidance should be used by developers in Welsh waters. We note that the guidance document lists applicability to 'England, Wales & Northern Ireland', due to the location of Welsh SACs in the inshore and offshore region.</p> <p>Defining the distance over which the noisy activity disturbs harbour porpoise (the Effective Deterrent Range) is a useful, practical way of calculating the area over which effects may occur. However, NRW considers that there is still considerable uncertainty in the evidence underpinning calculation of these disturbance distances. NRW advises that applicants should calculate disturbance distances on a case by case basis using the latest published information and modelling procedures. Underwater noise propagation and behavioural responses of marine mammals require further measurement that better characterise the conditions in Welsh waters. Measures should be taken to address these evidence gaps strategically, or, in the absence of better generic data, on a case by case basis by applicants.</p> <p>We have concerns that the specified EDR distances may be misused where the required caveats are not applied. It is not clear if the figures in the guidance are intended as a minimum or maximum figure. Although the guidance highlights some empirical evidence to support the proposed</p>	<p>Natural Resources Wales</p>

		EDRs, the guidance acknowledges (Table 2) that there is no current evidence to support recommended EDRs for geophysical survey or unexploded ordnance. We believe that there is potential for fixed EDRs to disincentivise innovation on noise reduction. By making that assumption that piling using noise abatement techniques would have an EDR of 15km, the guidance removes the need to validate the effectiveness of noise abatement, thus removing the incentive to reduce noise any further.	
2.19. Advice for Scotland and Wales Appendix 2: Implementation	130	We note that Nationally Significant Infrastructure Projects in Welsh waters would require consideration of a Development Consent Order, administered via the Planning Inspectorate, and a Marine Licence, determined by NRW. We consider that there is potential for confusion on the application of this guidance for such projects, due to individual projects being consented by both the UK-wide Planning Inspectorate and NRW, combined with the different approaches taken by JNCC and NRW as SNCBs in the offshore and inshore regions respectively. We believe that clear communication will be needed to highlight that developers should not rely solely on this guidance when preparing environmental information reports for projects within Wales.	Natural Resources Wales
2.12. Activities/industries not covered by the guidance	131	Disturbance from other sources not accounted for in threshold-setting “This guidance applies only to regulated activities and therefore excludes shipping.” – the rationale put forward for the area/time thresholds is based on carrying capacity, which must depend on all sources of disturbance, not just those which qualify for the impulsive noise registry. Vessels are known to disrupt harbour porpoise foraging behaviour, and sources with frequencies higher than 10 kHz are also likely to disturb (see below). If this disturbance from other sources is known but unaccounted for, it undermines the rationale presented to justify the 20% and 10% targets, in that in practice it permits these targets to be exceeded due to the disturbance from other sources. Two ways to address this would be: a. Making an estimate of the shipping/other component of habitat loss and incorporating this into the disturbance assessment for the SAC. b. Lowering the 20% and 10% targets to take account of this disturbance not accounted for in the licensing process	CEFAS
2.14. Effective Deterrent Ranges (EDRs)	132	Clearer demonstration of the difference that noise abatement makes for allowable activity levels If noise abatement for pile driving is applied, the EDR falls by a third, from 26 km to 15 km, but the EDR-based area falls by two-thirds, from 2,124 km ² to 707 km ² . In other words, under these proposals, three times as much abated piling can	CEFAS

		take place compared to unabated piling. This is not spelled out in the current draft, and I think it is a critical point. This could be reflected in the text related to Figure 1, and could be clearly communicated through a worked example in Figure 1 showing how many piling operations could theoretically occur simultaneously when using noise abatement.	
2.16.10Hz to 10 kHz frequency range	133	<p>10 kHz upper limit on frequency</p> <p>“It also focusses on activities most likely to result in disturbance to porpoise, with sound frequencies between 10Hz to 10 kHz, following European Commission monitoring guidance (Dekeling et al. 2014), and therefore excludes shallow water profiling techniques (some sub-bottom profilers and multi-beam sonars), which typically operate at higher frequencies.”</p> <p>This frequency range is indeed the scope of the impulsive noise register, but it is wrong to say it is specific to harbour porpoise. Harbour porpoise hearing is most sensitive in range 10 kHz to 125 kHz, e.g. Kastelein, Ronald A., Jessica Schop, Lean Hoek, and Jennifer Covi. "Hearing thresholds of a harbor porpoise (<i>Phocoena phocoena</i>) for narrow-band sweeps." <i>The Journal of the Acoustical Society of America</i> 138, no. 4 (2015): 2508-2512. This evidence strongly indicates that higher frequency sources should be included, or if this is not possible, then a justification given. The reasoning as written here (for limiting to this frequency range) appears flawed.</p>	CEFAS
2.6. Seasonal areas within the SACs	134	<p>Area/time threshold outside peak season</p> <p>“Plans or projects potentially resulting in disturbance in the sites but operating outside of the season for which the site was identified will be unlikely to result in significant disturbance and therefore the noise management approach in this guidance won’t apply.”</p> <p>The justification for having a 10% average disturbance threshold in season, and not 20%, is “that within the SAC the abundance of harbour porpoise per unit habitat is generally higher than the equivalent sized habitat in the rest of the relevant Management Unit,” implying that were this higher density not the case, the higher per-day threshold of 20% would be appropriate. According to this argument, it would therefore seem to follow that outside of the SAC peak season, a threshold of 20% average disturbance should apply, rather than no limit whatsoever.</p>	CEFAS
2.14. Effective Deterrent Ranges (EDRs)	135	<p>Seismic distance of 10 km too small given latest evidence</p> <p>The 10 km EDR for seismic, as noted in the text, was an estimate based on the Thompson et al (2013) study for a 2D seismic survey. More recent data (which may have been published since this draft was prepared) show significant disturbance</p>	CEFAS

		out to at least 12 km (but not at 15 km) to harbour porpoise from a 3D seismic survey in the North Sea, so I would strongly advise that this figure is revised upward from 10 km to at least 12 km.	
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Appendix 2: Comments on implementation aspects related to the noise guidance

Theme	Comment reference number	Comment	Comment by
General	1	While we have low confidence in the evidence underpinning the area-based approach (see later comments), we do appreciate the benefits of this approach in managing in-combination impacts. More robust scientific information exists (see later comments) which could be used to underpin the area-based approach, such as the implementation of a noise limit. Finally, we have outstanding concerns regarding the evidence and implementation of the SNCB advice (see later comments).	The Wildlife Trust
General	18	In the introduction, it “is recognised that there is low confidence in the evidence base for the guidance” and so that “regulators can consider (other evidence) in preference to the guidelines”. This will make commenting on individual applications very difficult. In Section 2 they consider quantifying the numbers of porpoise disturbed and secondly in quantifying the loss of habitat available to harbour porpoise. Given the admittance of the low evidence base, both these approaches are flawed.	Whale and Dolphin Conservation Society
General	25	It is our understanding that wording had been agreed for a draft site integrity plan condition between BEIS and the MMO about 18 months ago; however, the text indicates that SNCBs and regulators are still working on such a condition. It would be helpful if the guidance could include, if/when available, the agreed standard wording as this would help provide clarity for developers.	The Crown Estate
General	29	Given separate advice is being developed by SNH and NRW, this could have implications for strategic work e.g. SEA, plan-level HRA, or developments with transboundary impact footprints.	The Crown Estate
General	30	The recommendation is made for a periodic review as this approach beds in and the evidence base evolves, but it would be good to understand more about how this would work in practice. E.g. how will this be achieved (will it be ad hoc and up to industry, periodic review of the guidance, requests for new evidence at agreed dates) or will it be through strategic studies or specific work already planned to collate new evidence. Presumably a collaborative effort will be needed to ensure as a complete an evidence base is drawn upon, with applicability to all relevant industries and activities – we’d welcome discussion with you on whether there is any potential for a project under the offshore wind	The Crown Estate

		strategic enabling actions programme to add value to this review process/cycle.	
General	32	It is still not clear how it is envisaged that the SNCBs and different regulators administering different licensable activities anticipate being able to coordinate with each other in first of all issuing consent decisions but also reviewing post-consent monitoring data, and/or whether the onus will also be on individual developers (within an industry or even between industries) to try and coordinate amongst themselves. Further details on any progress made in stakeholders and regulators developing a way of working together on this would be helpful.	The Crown Estate
General	36	We note that this consultation focuses on the evidence base for the draft SNCB guidance. Industry would value discussion and consultation on the proposed Implementation of the guidance and a timeframe for the implementation, specifically we wish to understand the potential impact on proposed surveys in 2020 which are in the planning phase now.	O&GUK
General	37	OGUK is supportive of a coherent network of marine protected areas and intentions to improve the protection of sensitive species, under the requirements of the UK Habitats directive and the Marine Strategy Framework Directive Programme of Measures. Given the low confidence in the evidence base (as acknowledged by the SNCB's) and as suggested previously, OGUK recommends that a trial of the threshold approach in the Guidance is carried out first at one SAC with suitable monitoring in-place. The trial should undergo periodic review and the results publish in peer reviewed paper(s) before widespread adoption of the Guidance	O&GUK
Timescales, design and spatial planning	15	Through our engagement in casework, we have witnessed the 'envelope' becoming broader each year, resulting in often uncertain and extreme worst-case scenarios. This makes scenario planning of underwater noise impacts by the regulators extremely difficult. For underwater noise management to be effective, developers must start to present more realistic scenarios at the earliest stage possible.	The Wildlife Trust
Timescales, design and spatial planning	16	As highlighted above, due to the broad range of scenarios presented by developers on the predicted underwater noise disturbance impact area, it makes it very difficult to predict both a project and strategic level what the cumulative impacts will be to inform an area-based management approach. The risk in this approach is that it is reliant on a retrospective reporting system. We advise that a noise limit would give certainty at an early stage on disturbance impacts and expectations on mitigation requirements. It would also allow real time management and	The Wildlife Trust

		reporting of underwater noise disturbance impacts.	
Timescales, design and spatial planning	17	<p>We welcome that discussions are taking place within the Southern North Sea Regulators Working Group on how to manage underwater noise impacts. However, we highlight that offshore wind Development Consent Orders are being passed on the reliance of an in-principle Site Integrity Plan without any regulatory mechanism for underwater noise management. We support the use of a Site Integrity Plans but highlight a lack of detail on the effectiveness of this approach, and minimal conditions in Development Consent Orders in relation to these plans.</p> <p>We also highlight that the delay in the Review of Consents for the Southern North Sea SAC is resulting in offshore wind farms progressing to construction without any conditions relating to the site.</p>	The Wildlife Trust
Timescales, design and spatial planning	119	<p>Developers need flexibility within a project schedule to manage delays and design changes, however the guidance does not reflect the ability of industry to commit to timescales or design.</p> <p>Key impacts to industry timescales include:</p> <ul style="list-style-type: none"> ▪ Contract for Difference (CfD) construction deadlines – developers must meet these deadlines which impacts when activities are scheduled, makes it hard to make changes, and raises management challenges for in-combination effects of projects ▪ Unforeseen delays at the time of HRA – e.g. additional UXO are found and a geophysical survey is required, yet there is no formal and workable directory of these plans ▪ Other delays – e.g. vessel availability or weather downtime <p>To mitigate difficulties with scheduling, developers require an envelope to allow for delays to be managed. To allow other applications to be determined however, industry would welcome a mechanism to facilitate giving back the envelope or headroom once works have started or been refined. This would assume that in giving back the headroom, the project should not need to then reconsider their cumulative assessment for any subsequent applications.</p>	Renewable UK
Timescales, design and spatial planning	119	<p>Other temporal issues include:</p> <ul style="list-style-type: none"> ▪ Understanding the proposed approach at an operational level – for instance, sequencing of piling is set post-consent, with approval of the piling schedule approved 1-2 years ahead of construction. Foundation types are considered during the design phase and as a major feature of the wind farm design cannot be changed last minute ▪ Seasonal restrictions – piling and UXO in winter raises H&S concerns, particularly for 	Renewable UK

		<p>projects located far offshore. Contrary to suggestions within the guidance, conducting surveys during sub-optimal times of the year (in terms of weather windows) is problematic due to the reduction in available operational time, exposure to poor weather (which increases risk to vessel crews and the environment) and can lead to an increased level of noise compared to conducting surveys in optimal conditions</p> <ul style="list-style-type: none"> ▪ Retrospective compliance monitoring – industry has concerns over making use of data to assess whether regulatory processes are being effective in keeping noise below the advised area or time thresholds (e.g. using the Marine Noise registry), as this may not facilitate timely monitoring ▪ Scheduling – what happens if noise making activities take longer than planned? (i.e. how will the approach take account of possible delays e.g. adverse weather conditions or unexpected geological impacts?) How far in advance of the noise making activities will a developer or surveyor have surety of whether their activities may take place? ▪ Over-precaution – the possibility of delays pushes industry to be precautionary to ensure works can be completed. If works are then completed early is there a mechanism for releasing the allocation? <p>The point at which management and mitigation measures specified in the guidance are not an option for a project requires further clarity. The guidance includes spatial planning/phasing (adaptive management, discussed below), alternative foundations (at which there is a point where they would not be viable), alternative methods of installation (certainty of use is variable) and sound mitigation at source (EDR, discussed below).</p>	
Timescales, design and spatial planning	43	Section 3.1, paragraph 3, footnote 4: there is an acceptance that daily compliance is not practical. The retrospective compliance approach 'required' would not be legally enforceable and is therefore not something appropriate to add as a licence condition.	OPRED
Timescales, design and spatial planning	65	This has the potential to cause unsafe situations where there is no flexibility in surveys for weather down-time. If there is a regulatory 'pressure,' where applicants need to undertake the survey on set days that cannot be amended then this may have the unintended consequence of continuing work in to unacceptable weather conditions. To stop an activity and resume at a later date is a substantial commercial and financial outlay, potentially delaying a project by a full year with all the resulting consequences.	OPRED
Timescales, design and spatial planning	98	The consenting process requirements and monitoring for noise generating activities varies between sectors. Geological consent in the oil	O&GUK

		<p>and gas industry for seismic surveys are usually sought and granted in a timeframe of 28 days, while some other activities are consented years in advance. The application of the threshold as proposed could result in a first-come first-served basis which, given these different timescales for projects and consents in the different sectors, could inadvertently create preferential treatment of certain activities.</p> <p>The specific timing of the seismic survey is not usually within the control of the oil and gas operator but is coordinated by the seismic contractor depending on vessel availability and a suitable weather window. These vessels do move in and out of the North Sea. All sectors will recognise the necessity of methodological flexibility to account for weather delays, and the uncertainties surrounding when activities will take place during the consented period. Delays in the consenting process for seismic surveys could impact drilling programme schedules and result in delay in production. Any challenge to survey consents based on the potential to exceed the noise threshold should be raised in the consenting process and not during operations which causes a delay in the surveys and increase in cost. This will require early planning and coordination across the regulators.</p> <p>Clarity on the timeframe for the implementation of the guidance would be welcomed to avoid potential significant disruption to planned survey activity for the summer 2020. These surveys are already on the planning phase.</p>	
Timescales, design and spatial planning	94	<p>Projects looking to undertake activities within the SAC will aim to minimise project risk and submit applications with worst-case scenarios and extended dates with the aim of ensuring that there is no risk of having to re-apply for extensions to consented activities, which could be refused due to the exceedance of the arbitrary thresholds. How is this going to be managed?</p> <p>It is unclear how Defra propose to manage the daily and seasonal totals, when there will inevitably be considerable uncertainty as to what activities are being undertaken on a daily basis. This uncertainty poses a significant risk that activities relating to the construction of offshore energy projects could be either refused a consent, delayed or cancelled by the use of these thresholds. It is therefore critical that if this approach is taken forward that before doing so the uncertainties and concerns surrounding how all offshore activities are to be managed are fully resolved and that both industry and stakeholders are properly consulted.</p>	OPRED Genesis report
Timescales, design and spatial planning	92	The JNCC letter accompanying the guidance document describes the approach as being 'a pragmatic approach to managing underwater	OPRED Genesis report

		<p>noise'. It would be good to understand how this pragmatism is going to manifest itself when determining whether projects can proceed. Recognising that, to date, assessments using this approach have been based on considerable amount of uncertainty in both the timing and the duration of their impacts. The assessments may have over-estimated either the proportion of the SAC that will be affected or the duration of the impacts or both. If this is the case, this will lead to future activities being unnecessarily delayed or cancelled due to incomplete or inaccurate information. To improve our understanding on the level of uncertainty regarding the temporal and spatial scale of predicted effects an assessment of the planned (consented) and actual level of impact from all consented activities undertaken within the SAC over the last few years could be undertaken. This would improve our understanding of whether the proposed approach to managing noise is suitable and whether it significantly over/under-estimates the extent and duration of impacts.</p>	
<p>Timescales, design and spatial planning</p>	<p>97</p>	<p>Understanding that this consultation is focused on the evidence base, the IAGC also wishes to highlight again the concerns regarding implementation of the proposed guidance. There are a number of significant practical limitations. Principally among these is the scheduling of 'competing' activities, where it is likely that the commencement of one activity may exclude others at any given time. We believe that it likely represents a competitive problem, both at a local level, and in terms of various anti-trust laws, by which seismic companies engaged in activities on the UKCS remain bound to their nation of incorporation. Activities that may be scheduled, such as seismic surveys, site surveys, construction piling and ordnance removal all have very different planning horizons which will be extremely hard to coordinate. It is understood from previous discussions that BEIS are developing a scheduling tool to aid the process, and IAGC looks forward to understanding more about this process and engaging further. We have previously raised concerns about the scheduling of activities during non-optimal seasons, which is an ongoing concern. Surveys conducted outside of favourable weather conditions are more costly, often result in greater levels of noise in the environment, and increase the risk of health, safety and environmental incidents. Compounded by additional scheduling windows being imposed, this may risk activities not taking place at all, which would do significant harm to the business confidence in those parts of the UKCS affected.</p>	<p>IAGC</p>
<p>Timescales, design and spatial planning</p>	<p>110</p>	<p>We also note that the guidance, being focused on wind farm construction, does not include near shore construction activities such as harbour or</p>	<p>Energy UK</p>

		power station related works. The examples within the guidance suggest that the area lost to porpoise from the installation of a small number of wind turbine masts would exceed the proposed 20% daily or 10% seasonal loss of habitat in a SAC potentially preventing near shore construction if these near shore activities were included within the in-combination assessment. We suggest that the guidance addresses these construction activities possibly by introducing a threshold below which activities are deemed not to be significant in terms of impact on harbour porpoise.	
Timescales, design and spatial planning	64	There has been no change to the seasonal approach which means the two separate winter areas within the Southern North Sea SAC continue to be accounted for as if they were a single area with no consideration of distance / connectivity and how animals moving to and from these areas may be affected by activity nearby. Make sure this is in implementation	Hartley & Anderson
Timescales, design and spatial planning	127	Depending on ground conditions, more 'noisy' techniques may be required if alternative methods fail during implementation – e.g. during piling, a conventional hammer will be used as a back-up should vibropiling be unsuccessful. Consequently, developers always need to assess the worst-case scenario which directly impacts the noise threshold	Renewables UK
Timescales, design and spatial planning	130	We note that Nationally Significant Infrastructure Projects in Welsh waters would require consideration of a Development Consent Order, administered via the Planning Inspectorate, and a Marine Licence, determined by NRW. We consider that there is potential for confusion on the application of this guidance for such projects, due to individual projects being consented by both the UK-wide Planning Inspectorate and NRW, combined with the different approaches taken by JNCC and NRW as SNCBs in the offshore and inshore regions respectively. We believe that clear communication will be needed to highlight that developers should not rely solely on this guidance when preparing environmental information reports for projects within Wales.	NRW
Cumulative effects and in-combination assessments	16	Due to the broad range of scenarios presented by developers on the predicted underwater noise disturbance impact area, it makes it very difficult to predict both a project and strategic level what the cumulative impacts will be to inform an area-based management approach. The risk in this approach is that it is reliant on a retrospective reporting system. We advise that a noise limit would give certainty at an early stage on disturbance impacts and expectations on mitigation requirements. It would also allow real time management and reporting of underwater noise disturbance impacts.	The Wildlife Trust

<p>Cumulative effects and in-combination assessments</p>	<p>117</p>	<p>Stakeholder engagement</p> <p>The guidance sets out the proposed approach for a 2-stage process: under the Habitats Regulation Assessment (HRA) as part of a Development Consent Order (DCO) application for an offshore wind farm, and then again under the Deemed Marine Licence (DML) condition which includes changes based on what is known about the project design at that stage. Given that this approach is consistent with the approach taken under the ongoing Review of Consent (RoC) for the Southern North Sea SCI/cSAC and the Site Integrity Plan (SIP), it would be appropriate to wait for the outcomes of these key legislative processes before finalising the wording within this guidance. Consultation comments on the draft HRA and SIP marine licence condition are being reviewed by the MMO and BEIS with the expectation that these documents will be finalised in the coming months. The guidance is currently badged as SNCB guidance, but it is unclear whether this guidance is supported by the MMO and BEIS, as the key regulators. Therefore, it would be useful if their input into the document could be confirmed.</p> <p>Planning of noisy activities between developers within the wind industry and with other industries requires careful consideration (see also, in-combination assessments below). The guidance suggests that if a plan or project has been consented (which could cause noise disturbance up to the allowable maximum daily threshold) then no other noise disturbance should be allowed to take place unless they can be scheduled to occur during days when no other noisy activities are planned (whilst also ensuring the seasonal threshold is not exceeded). The guidance notes that industries with relevant plans or projects requiring HRA should be encouraged to contribute to evidence gathering to inform such evaluations, however clarity is needed on how activities from other sectors or noise emitters will be controlled and monitored. Industry would also welcome clarity on how up to date information from other industries could be shared using a possible tool for cross-sector notification. The information at present is not adaptable as projects change and is not in a format that is readily adaptable to the SAC process. There would need to be clear methods for monitoring set up, following the same standards, so that data collected is comparable and verified.</p> <p>Specifically, it is unclear how the Oil and Gas sector are captured within this approach. Given the consenting risk offshore wind projects could face as a result of differing submission and</p>	<p>Renewable UK</p>
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		<p>approval timelines between sectors, and the consequent impact on in-combination assessments, an understanding of how different sectors approach noise monitoring will be key. RenewableUK has written to OPRED to request sight of the guidance they have produced on the Oil and Gas industry's approach to managing underwater noise, to help the offshore wind industry better understand the types of management measures that may be expected in the future across both industries. We note that OPRED have not adopted the SNCB guidance, due to a number of outstanding concerns including the scientific robustness of the proposed threshold approach; its application for a highly wide-ranging mobile species; its implementation and subsequent enforcement.</p>	
<p>Cumulative effects and in-combination assessments</p>	<p>118</p>	<p>Cumulative effects and in-combination assessments</p> <p>Clarity in the requirements for underwater noise modelling techniques (given the variability in models used and their outputs) will not only be important for in-combination effects with other industries but also for assessing the cumulative effects of other wind farms. A clear approach will need to be agreed and communicated to industry and stakeholders. Careful consideration will be required for managing cumulative effects during project construction as there could be significant implications to adjacent projects. Industry raises the following questions:</p> <ul style="list-style-type: none"> ▪ What would happen if one project carries out an activity that exceeds the area/time thresholds for subsea noise? ▪ How will daily thresholds be monitored by industry or regulators? ▪ Example provided in section 3.31 – does this mean that any other activity within the area would be prohibited? If so, how would this be managed and monitored? ▪ How will in-combination thresholds be managed in real life pre-construction and construction phases of offshore wind farm development? How far in advance will potentially noisy activities be assigned to projects and what will happen if a project does not utilize the allowed threshold in the time allocated to it? ▪ What types of survey device need to be considered for in-combination assessments in an HRA? Most offshore wind farm geophysical surveys, even those incorporating sub-bottom profilers are unlikely to have an EDR of more than a few meters. <p>Managing noisy activities across projects will require careful collaboration between sites and flexibility will need to be included for delays. If there are delays outside those expected, then this could lead to serious implications to multiple projects in terms of costs and programme. There</p>	<p>Renewable UK</p>

		<p>may also be other projects in the vicinity that could result in noisy activities unknown at the time of planning to the individual projects. Even during the design stage there may be little knowledge of when surveys or other noisy activities may be undertaken by other wind farm developers or other industries. Given the issues which could arise, industry would welcome clarity on how the MMO decision-making process will apply to two parallel applications or projects.</p>	
Cumulative effects and in-combination assessments	91	<p>Implementation of the guidance for HRA or EIA/permit consent is potentially very difficult, for example calculating cumulative impacts across a range of different possible applications (e.g. seismic survey versus piling), geographic locations and dates.</p> <ul style="list-style-type: none"> • Will a methodology be published for making the impact calculations in e.g. GIS? • Will a database be made available for proposed piling activities / seismic surveys with timings and assessments that have been undertaken so that a cumulative assessment can be made? <p>A consistent approach and database of assessment carried out would help to ensure that noise related activities remain within the limits that have been proposed.</p>	OPRED Genesis report
Cumulative effects and in-combination assessments	39	<p>OPRED also have concerns about other non-regulated activities that may have an impact but not captured under the guidance, such as geological surveys conducted for non-oil and gas sectors, which are only have a voluntary notification process in place.</p>	OPRED
Cumulative effects and in-combination assessments	93	<p>Will transboundary impacts be considered? For example, noisy activities in Dutch waters could cause an exceedance of the thresholds. How will this be managed?</p>	OPRED Genesis report
Cumulative effects and in-combination assessments	95	<p>Limited information is available on projects in other sectors to operators at the time of application for geological consent and individual operators do not have access to details of any limits or time constraints conditions placed in consents already granted to others. This information is only be held by the regulators. Any prioritisation of activities would therefore have to be carried out by the regulators post-application, and it is not clear at present how the various regulators could co-ordinate approvals within this framework. Furthermore, it is unclear</p>	O&GUK

		<p>who has ultimate decision-making power should two activities wish to coincide within the SAC. OGUK understands that the activity tracker is under development between regulators and recommends that this is made widely available to all operators and developers. This does not need to name the operator or developer but should outline the activity, scale of the activity and noise generation and any restrictions or thresholds imposed or noise mitigation measures.</p> <p>The area has the potential to support the new CCUS industry which will require geophysical surveys and drilling activities in future. There is also a lot of decommissioning activity on going in the SNS which does require use of cutting and explosive equipment. Usually this work is coordinated by the contractor and will be carried out around other planned activities such as pipe-lay or wind farm installation.</p>	
Cumulative effects and in-combination assessments	126	The guidance recommends that careful planning is required within the HRA process to ensure that the threshold of 20% is not exceeded – it is important to note that this is via the Marine Licencing regime rather than planning and would need to be associated with the marine licence condition control (N.B. this does not include geophysical surveys and UXO)	Renewables UK
Adaptive management, monitoring and update of thresholds	27	Updating the evidence base - p6 states “there will need to be a periodic review (e.g. every 2 years) of the suitability of the proposed EDRs in light of new peer-reviewed evidence such as that gathered through construction monitoring conditions.” – perhaps more of a process/implementation matter, but it would be helpful to understand what sort of process is envisaged for the review, e.g. who will lead and coordinate, will it draw upon post consent monitoring data as well as R&D projects, how will the updated review/evidence base be made available.	The Crown Estate
Adaptive management, monitoring and update of thresholds	120	<p><i>Adaptive management:</i> As new evidence becomes available through monitoring, the intention is that best practice noise mitigation can be updated, allowing management to be adaptive. Industry supports this approach but would welcome greater clarity on what this process would look like and how this would work in practice, including:</p> <ul style="list-style-type: none"> ▪ Is there a set period for review? Is there provision somewhere for standardising data or specifying the need or format? ▪ At what point within a project lifecycle would a developer be required to start considering new evidence? Developers with approved plans (i.e. with pre-construction documents signed off) should not be required to retrospectively re-assess at sight of any new evidence. Applying adaptive management during the construction stage, for instance, may not be practicable. It will 	Renewable UK

		<p>therefore be important to identify when further changes cannot be made.</p> <ul style="list-style-type: none"> ▪ How will the in-combination effect be managed? i.e. how will 'new' projects that come forward in the interim be managed, in a way to ensure enough headroom remains for the project awaiting confirmation via SIP? ▪ How will the ability of projects to refine the project design or timescale post- HRA/pre-SIP- be taken into consideration? Projects have an in-built 'headroom' capacity at application HRA – how will that capacity be traded and managed? Can a project retain unneeded headroom, or conversely can headroom be returned to the overall available capacity? Can such headroom be traded between developers or projects? ▪ How will activities not included in the DCO (e.g. UXO clearance or survey work) be assured of the availability of headroom? ▪ How can unforeseen factors requiring rapid resolution be included – e.g. when additional UXO are located which will then require a geophysical survey? 	
Adaptive management, monitoring and update of thresholds	114	We would welcome clarity on how new data submitted to the new Joint Cetacean Data Programme feed into potential updates of the Guidance for assessing the significance of noise disturbance against Conservation Objectives of harbour porpoise SACs.	Energy UK
Adaptive management, monitoring and update of thresholds	108	We would welcome clarity on the extent to which 'as-built' survey data using actual hammer energy will be used to refine the EDR. If the EDR is based on maximum consented hammer energies or UXO detonations only, we are concerned that this could lead to over-precaution for cumulative impact assessments.	Energy UK
Adaptive management, monitoring and update of thresholds	111	Clarity on how changes in prey availability and distribution, which will directly influence harbour porpoise distribution across Southern North Sea Special Areas of Conservation (SNS SAC), would be incorporated in the guidance.	EDF
Adaptive management, monitoring and update of thresholds	101	Clarity on how new data submitted to the new Joint Cetacean Data Programme will feed into potential updates of the Guidance for assessing the significance of noise disturbance against Conservation Objectives of harbour porpoise SACs.	EDF
Adaptive management, monitoring and update of thresholds	69	Applicants can only be asked to provide monitoring evidence if it relates to a need on the permit/consent itself. Whilst some may be willing to go over and above what is required by the consent, a regulator cannot ask for further evidence if it is not directly related to the consent.	OPRED
Adaptive management, monitoring and update of thresholds	89	In practice, the risk of industry [oil and gas] exceeding the thresholds is relatively low. For improved environmental outcomes, implementation should focus on encouraging noise abatement rather than creating an overly complicated arrangement. A simpler approach	Hartley Anderson

		would be to set an upper limit to the number of monopiles that can be installed at any one time without mitigation (one or two) while at the same time allowing any development that uses noise abatement with monopiles or any other foundation to go ahead. For balance between industries a maximum footprint for seismic surveys should also be defined, although there is no evidence to suggest exploration activity within porpoise SACs will increase over the next decade.	
Adaptive management, monitoring and update of thresholds	99	<p>It would be very helpful to understand what the requirements / expectations are for monitoring:</p> <ul style="list-style-type: none"> • Effectiveness of any proposed management measures • Compliance with noise thresholds beyond the current practice of submission of close out reports to the noise registry <p>It would also be helpful if the monitoring plan for the site was shared by JNCC.</p>	O&GUK
Adaptive management, monitoring and update of thresholds	100	It is understood that the Special Areas of Conservation (SAC) designation is based on the site usability by harbour porpoise. EDF would welcome confirmation from JNCC on whether there is any ongoing or planned work to undertake studies on prey availability and prey distribution to determine habitat suitability over time. EDF would welcome clarity on how changes in prey availability and distribution, which will directly influence harbour porpoise distribution across Southern North Sea Special Areas of Conservation (SNS SAC), would be incorporated in the guidance.	EDF
Enforcement	96	It is unclear from the Guidance, how the noise thresholds will be practically enforced across the sectors and by different regulators. The seasonal threshold applies over a season and over many different potential activities. It is unclear who from different developers/ operators would be held accountable for exceeding the threshold if individually remained in the limits set in their consents/ permits but the seasonal threshold was collectively exceeded and when enforcement action would be taken	O&GUK
JNCC Mitigation guidelines	122	JNCC guidance on injury risk – the current guidance is dated (particularly for piling and UXO) and is not relevant to the type of survey typical for offshore wind farms. Industry would welcome updated guidance, that takes account of updated thresholds, measured range of PTS risk, updated use of ADDs, shift in impulsive to non-impulsive over distance, and the ecological consequence of PTS	Renewables UK