



The deliberate disturbance of marine European Protected Species

Guidance for English and Welsh territorial waters and the UK offshore marine area

By

JNCC

March 2008

2. Assessing the likelihood of a disturbance offence

2.1. The need for a case-by-case approach

Activity-specific

A case-by-case approach is needed when assessing the likely impact of an activity. The Habitats Directive Article 12 guidance¹ states that '*the intensity, duration and frequency of repetition of disturbances are important parameters when assessing the possible impact of disturbance on a species*'. Thus a **single act may fall below the threshold of 'significant disturbance', but a repetition of the same act may result in the threshold being reached**, resulting in 'significant disturbance'. Additionally, the impact of an activity may not be significant in isolation, but may become significant if other activities in the area are also disturbing the same individuals or other individuals of the same population.

Potential factors of disturbance that have been identified include certain types of loud sounds and physical obstruction. Apart from direct effects on the species, these factors also have the potential to cause secondary effects such as changes in the nature of the habitat (e.g. loss of feeding areas) and/or reduction in food availability (*see section 3*). The likelihood of causing 'significant disturbance' should be assessed based on the **best possible available information on: i) the specific disturbance factors and their potential for adversely affecting the species concerned, and ii) the species and populations in the area affected**. Caution should be used in cases where there is no available evidence, but where there are serious concerns of potential population-level effects arising from the particular factor of disturbance,

Mitigation measures should be put in place if a significant group of animals is likely to be exposed or if the area affected is considered essential habitat or is one of persistent high density for the animals concerned. This should be done by recognising the limitations and uncertainty in the assessment of risk and using the precautionary principle in a proportionate manner (e.g. more cautious when the FCS assessment is "unfavourable" or "unknown"). The process of assessing the likelihood of committing a disturbance offence should also help to identify gaps in knowledge and foster data collection to reduce the uncertainty in future risk assessments.

Species-specific

A species-by-species approach is needed to determine whether a proposed activity is likely to result in the disturbance offence being committed. The main reason for this is that different species may have different sensitivities or reactions to the same type of disturbance, which have to be taken into account in any meaningful protection system. In addition, the species FCS assessment should also be taken into consideration (*see appendix IV*). Disturbance could have negligible effects on a population that is doing well in terms of quality (e.g. reproductive success, age-structure) and quantity (stable or increasing size) and has good prospects of continuing to do so in future; but it could potentially have significant effects on a population with an 'unfavourable' assessment that might face many other pressures.

The sensitivity of a species to disturbance may also be different depending on the season or on stages in its life cycle, and Article 12(1)(b) takes this into account by stressing that

disturbance should be prohibited particularly during sensitive periods (breeding, rearing, hibernation and migration). For cetaceans, it is difficult to identify which (if any) biological activities might render animals more vulnerable to particular disturbance factors, or what periods might be more sensitive. In addition, the Regulations relate to breeding, rearing and nurturing young, which would, for most cetacean species, coincide with a whole year. Also, for cetaceans, currently there is no evidence to support the perceived idea that mothers and newborn calves will be more vulnerable to disturbance than say, for example, mature females and juveniles. For some species, it is possible that if mature females were adversely affected the consequences on population reproductive rates could be more detrimental than if males were affected. However, in practice, it will be difficult to distinguish males and females in the field and, for many species in UK waters; it is more likely that both males and females occur in any given area. Thus, unless evidence for the contrary arises, all times of the year and all areas, in which cetaceans are known to occur, should be treated equally when considering the likelihood that disturbance would adversely affect a significant group.

For cetaceans in UK waters, and with the exception of Special Areas of Conservation (SACs), there is currently also no evidence to show that any particular areas should be singled out as being used for breeding/rearing, in a persistent manner by any population, unlike, for example, the systematic gathering of a large proportion of a baleen whale population to breed or feed in a specific part of the world. Thus, given the temporal variability in cetacean habitat use (in UK waters), it would be inappropriate, for most species, to distinguish particular areas as being more sensitive to disturbance based on habitat use. Within SACs, the likelihood of disturbance should be assessed within the ‘appropriate assessment’ framework.

2.2. When is an activity likely to significantly affect the ability of any significant group of animals of that species to survive, breed, or rear or nurture their young?

Any biological definition of what constitutes a significant group of animals should take into account the **population size**, the **local abundance of the species** (i.e. the percentage of the whole populationⁱⁱⁱ likely to occur in a certain area at a certain time) and its **FCS assessment** (i.e. favourable/unfavourable/unknown). Two other parameters that must be considered in order to assess the number of animals that are likely to become exposed to the potential disturbance are: the **schooling behaviour** of the species (e.g. if it forms tight aggregations or the individuals are spread over wide areas, and any regional or seasonal variations); and the **circumstances in which the disturbance might take place** (e.g. time of the year, and the spatial and temporal range of the impact).

The best abundance estimates available should be used as a baseline population size from which to use the thresholds for considering if the number of animals likely to be exposed to disturbance could be considered as a “significant group”. These estimates should, however, be used according to any evidence of regional population genetic structuring. If, in a certain area, there is evidence supporting the existence of a population that has reduced geneflow with adjacent populations (this is usually consistent with a certain level of site-fidelity of individual animals) then separate population size estimates should be used for each of the populations identified, and significant groups adjusted accordingly. For coastal bottlenose

ⁱⁱⁱ “Population” is defined here as a group of individuals of the same species living in a geographic area at the same time that are (potentially) interbreeding (i.e. sharing a common gene pool) following article 12 guidance. See appendix III.

dolphins occurring off the UK, for example, there is evidence for a regional population genetic structure consistent with some degree of local habitat dependence. Coastal bottlenose dolphins can form small and relatively geographically isolated populations of 100-200 individuals, and so a small number of animals exposed to disturbance could be considered as a significant group. Harbour porpoises, the most abundant marine mammal species in UK and adjacent waters, are known to form large populations whose individuals may range over very large distances (e.g. the whole of the British North Sea). For this species, a significant group of animals is likely to comprise a much larger number of animals (**note:** for marine EPS, the term ‘group’ is being interpreted as the number of animals exposed, and these do not necessarily need to be in close proximity or engaged in a similar activity).

For many cetacean species in UK waters, particularly those occurring predominately on the continental shelf (i.e. harbour porpoise, minke whale, white-beaked dolphin and bottlenose dolphin) the best available estimates are those provided by the [SCANS II](#) survey blocks. Abundance estimates relative to the SCANS II survey blocks that are relevant to a population’s natural range should be added up to provide the best available population estimate. In addition, the best available estimates of density should be used to estimate the number of animals likely to get exposed to the disturbance in the area affected. For example, estimates of density per broad region can be obtained from the [SCANS II](#) report (to be published soon, see Figure 1 and Table 1) and should be used if no other, finer-scale information is available.

For species that tend to be solitary when not breeding, which is the case for the sturgeon and turtles occurring in the UK, the spatial and temporal extent of the activity(s) would need to be large enough for a significant group to be affected. In circumstances where a significant proportion of the population was likely to occur in the area affected by disturbance, during the course of the activity, there could, potentially, be a risk of disturbing a significant group. Cetacean species, by contrast, form groups of various sizes, depending on the species, their behaviour, the time of the year and the region. Even when not closely associated or engaged in a common activity, if one individual of a species is sighted in an area it is likely that other animals are in the proximity. The gregarious behaviour of cetaceans therefore makes them more vulnerable to disturbance, since significant groups of animals could potentially be affected by shorter-term activities with smaller ranges of impact.

Considering the conservation status of the species (FCS assessment), a distinction should be made between species for which the FCS was assessed as ‘favourable’ and those for which the FCS was assessed as ‘unknown’ or ‘unfavourable’ (see appendix IV). The number of animals exposed to disturbance that would constitute a significant group would differ for two species with similar population sizes but different FCS assessments. This is because disturbance could have negligible effects on a group of animals from a population that is doing well in terms of quality and quantity (and has good prospects of continuing to do so in future) but it could have significant effects on a similar sized group of a population with an ‘unfavourable’ assessment that might face many other pressures.

There is need for guidance to help assess whether a number of animals that is likely to be exposed to disturbance can be considered a significant group or not. The annual, potential cetacean population rate of increase has been estimated, using models, to be in the order of 4%, and in the absence of better information, it is considered that this is a reasonable measure^{2,3}. For the population level to remain stable this increase has to be at least equal to the sum of the mortality affecting the population (e.g. mortalities due to human activities and

to natural mortality). The maximum mortality resulting incidentally from fisheries activities which will enable a population of [small cetaceans] to remain stable has been calculated at 1.7%. Relating these annual figures to disturbance effects is difficult by reason that, although most disturbance effects will be less harmful than incidental take by fisheries, the guidance should attempt to be relevant to potential individual disturbance events, not to the totality of disturbance events within a population's natural range.

This guidance proposes that threshold percentages are set to help determine what would constitute a significant group. We consider that this threshold should be lower for cetacean species with unfavourable or unknown FCS than for those where this is favourable. We also consider that the % figures should be no higher than a cetacean population potential rate of increase. In this consultation, we are seeking views on what these thresholds should be. For cetacean species with 'unfavourable' or 'unknown' FCS should be either 1% or 2% of the best available population^{iv} estimate, and for cetacean species where the FCS is 'favourable' the threshold should be either 2% or 4%. JNCC would welcome views on this, together with the reasons for respondents' conclusions.

However, it is important to note that these are only yardsticks aimed at assessing potential population level impacts which, in the light of new information could be re-evaluated; hence they should be taken simply as guidelines. The onus should be on the developer, or person (entity) carrying out the activity to employ mitigation where the fraction of the population that could be exposed to disturbance comes anywhere near these thresholds. Developments should also be timed and located, as far as possible, to avoid periods and areas where animals of a marine EPS could be present. It should be borne in mind that, for some activities, mitigation is employed primarily to prevent injury and death (therefore excluding the possibility of committing those offences). This in itself might be sufficient to avoid disturbing the animals, depending on the extent and characteristics of the activity and the permanency of the animals within the area affected. However, this might not apply to all situations and again the onus should be on the developer or person (entity) carrying out the activity to assess whether disturbance is still likely to occur and employ more comprehensive mitigation measures if a significant group is likely to become exposed.

For species in which the number of animals that would constitute a significant group is substantially higher than the average school size (see section 4 for each species), the exposure of a significant group of animals would only occur if an activity (or assemblage of activities) was likely to be persistent long enough in an area or affect a large enough area within the population's natural range that it would expose several schools of that species to disturbance. These include the bottlenose dolphin (offshore populations only), harbour porpoise, white-beaked dolphin, common dolphin, white-sided dolphin, killer whale, long-finned pilot whale, sperm whale, minke whale, fin whale, northern bottlenose whale, humpback whale, sei whale),

For coastal **bottlenose dolphins** and **Risso's dolphins** and for **beaked whale species** (except northern bottlenose whales) the number of animals that would constitute a significant group would be closer to the average school sizes (see section 4 for each species). In practice this

^{iv} Again, "population" is defined here as a group of individuals of the same species living in a geographic area at the same time that are (potentially) interbreeding (i.e. sharing a common gene pool) following article 12 guidance. See appendix III.

means that **where these animals are found one should assume that a significant group could be present at any time and in the area of any individual activity.**

Long-term, chronic exposure of the same individuals to a potential factor of disturbance in a particular area is likely only to affect species that have shown long-term site fidelity, i.e. individual animals occurring persistently (observed several times during one year, or year after year in a relatively discrete area). In UK waters this has been shown for coastal bottlenose dolphins and for Risso's dolphins^{14; 15}.

For most of the other species, the number of animals using particular areas may vary considerably between seasons and years. Evidence for a seasonal pattern in occurrence should be looked at on a case-by-case basis and considered when assessing the likelihood of exposing a significant group to disturbance. However, in areas where a species is known to occur but information on seasonality is lacking, or where there are no long-term records to support suggestions of seasonality, **it should be assumed that animals could be present at any time of the year.** In cases where disturbance is likely to occur and there is insufficient information on the abundance of cetacean species in the area of the activity, dedicated surveys are recommended over a number of seasons before the start of the activity.

In summary, the following criteria should be taken into consideration when assessing the likelihood of a 'significant group of animals' being adversely affected:

- the likelihood of potential disturbance factors and their impact on the species concerned;
- the best and most recent estimate of the size of the population to which the animals in an area belong, taking into consideration possible geographically 'isolated' populations, e.g. coastal bottlenose dolphins (see Appendix IV);
- grouping patterns (i.e. spatial cohesion, group size) and spatio-temporal variation;
- the species FCS assessment in UK (see Appendix IV); and
- how many animals of each species there are likely to be in the area and time affected by the disturbance (e.g. using densities in Table 2), and what percentage of the population might this represent compared to the thresholds mentioned above (1%(2%) and 2%(4%)).

2.3. When is an activity likely to significantly affect the 'local distribution or abundance' of the species?

The assessment of the likelihood that the local distribution and abundance of a species could be significantly affected by an activity should be carried out, using the best information available. Certain factors should be considered such as evidence for **permanent displacement** of a species from an area caused by potential disturbance factors; whether the affected area constitutes **a large proportion of an essential habitat** (relative importance to the species/population); whether a **significant proportion of a population** would be displaced from that essential habitat and the **context** of the impact in terms of other potential disturbances within their natural range.

There is evidence that disturbance caused by some activities (e.g. those causing persistent high levels of anthropogenic sound), can result in cetaceans being displaced from a particular area during the time period of the disturbance factor^{4; 5; 6}. However, we consider that for a

significant effect on the local distribution or abundance of a species to occur, disturbance would need to produce more than a transient effect and result in a detrimental deviation from the natural variability in the spatio-temporal distribution and abundance of the species and its populations within their natural range. This would occur, for example, if a significant group of animals of a population were to become displaced from a large fraction of an essential habitat or a large fraction of their overall natural range. In a situation where those animals would be displaced to an area with lower prey availability, the balance of their energy budgets could be affected.

Different species have different energy requirements and balance their energy budgets at different scales. Smaller species (dolphins and porpoises) must balance their energy budgets on a scale of days while large baleen whales use a 1-year cycle during which they carry out migrations to high latitudes to feed in the summer and then fast for the rest of the year at lower latitudes, often engaging in breeding behaviours. Disturbance that displaced a baleen whale from its feeding grounds for a large proportion of the feeding season could therefore have serious consequences on its survival and breeding success, with consequences on the population if the number of whales affected was a significant fraction of the population, and therefore could be considered significant in the context of the objectives of the Habitats Directive.

Although in UK waters there are no specific summer feeding grounds as in the example above, the marine environment is not uniform and animals use specific environmental clues for navigating and searching for their prey. As a result, one is expected to find cetaceans in clumped distributions, in some cases leading to the identification of persistent areas of use. Whether these areas can be considered essential for the maintenance of a population will depend on the size and conservation status of the population and on the suitability and temporal persistency of those habitats compared to others within their natural range.

The availability of suitable alternative areas to that from which the animals might get displaced could be important or even critical for their survival. In contrast with terrestrial mammals, where there might not be adjacent alternative areas for the animals to move to (lack of connectivity between habitats), there will usually be adjacent areas for cetaceans to move to that are within the natural range of their populations, and hence compensate for the loss of a particular area of habitat^{4; 7}. However, it cannot be assumed that displaced animals will fare as well in some other part of their range⁸, since adjacent areas might be already populated, potentially resulting in increased competition, or be of lower habitat quality.

All cetacean species occurring in UK waters are wide-ranging, their distribution and abundance varies considerably in time and space and is influenced by both natural and anthropogenic factors. Their habitats encompass large areas and, so far, no essential habitats or areas of persistent high density have been identified for any species with the exception of the bottlenose dolphin in coastal areas. The identification of essential habitats is in practice very difficult to do for cetaceans. The data available is often also insufficient. Hence, we consider that it will be difficult to show that disturbance within the terms of regulation 39(1)(b)(ii) has occurred, since a displacement of a large group of animals could be part of a generalised species/population distribution shift, caused by factors other than disturbance (e.g. the harbour porpoise distribution shift in the North Sea⁹; and the decline in the bottlenose dolphin utilisation of the Moray Firth SAC due to an expansion of their range along the Scottish east coast, rather than as a result of a decline in the abundance of the population¹⁰).

For species for which there is some evidence of geographic structuring and of site fidelity by a group of individuals, it is reasonable to assume that those areas are important for those groups. Hence, for these species, it is appropriate to identify areas where, if the species were to be displaced, even if only temporarily, significant effects at the population level might occur. The significance of the duration of the displacement would have to be assessed on a case by case basis, depending on the patterns of species occurrence in the area affected. While it is unlikely that a displacement that lasted for one day would constitute an offence, weeks of displacement could be considered as significant disturbance. In the UK, it is likely that **coastal bottlenose dolphins** and **coastal Risso's dolphins** fall under this category. For bottlenose dolphins, SACs identify those important areas. Two areas of coastal water (Moray Firth and Cardigan Bay) containing habitats that are essential for survival and reproduction have been designated as Special Areas of Conservation (SACs). Any activity to be carried out in a SACs needs to be subjected to an "appropriate assessment" by the relevant authorities if it is likely to significantly affect the qualifying features of the SAC (including the dolphin population). For Risso's dolphins, current information points to obvious persistent concentrations in waters around the Outer Hebrides, in the southern Irish Sea, in the St George's Channel, off north Wales and the Isle of Man.

There is currently no evidence that other species' groups use particular areas persistently and in a way that differs from other areas within the natural range of the population. However, further work is required to establish, with any reasonable level of certainty, the existence, or lack of it, of such areas for other species and recent initiatives such as the [Joint Cetacean Protocol](#) and the Strategic Environmental Assessments might be able to address this. For harbour porpoises, for example, work also continues on the identification of possible SACs in UK waters¹⁶. If, for any species of cetacean, new evidence comes to light on the existence in UK waters, of particular areas of persistent use that are different from any other area within the natural range of the population, then precaution should be applied and a consideration should be made of the possibility that their local abundance and distribution could be significantly affected.

In summary, the following criteria should be taken into consideration when assessing whether the local distribution or abundance of a species would be likely to be significantly affected by the disturbance:

- evidence (from the literature) of species displacement caused by the particular factor of disturbance generated by the activity considered;
- the distribution and abundance (including spatial and temporal variability at a comparable scale to that of the activity) of the species and its populations in the area likely to be impacted by the activity and in their natural range;
- the area likely to be impacted by the activity (does it include a large proportion of the suitable habitat used by a population, or includes persistent high animal density areas);
- the potential for a significant group of animals to get displaced (significant as in the first element of the offence - above a certain fraction of the population size estimate);
- species-specific movements (home range patterns, site-fidelity) and their magnitude; and
- the context in terms of other potential disturbances in the natural range of the species and its populations.

REFERENCES

1. EUROPEAN COMMISSION 2007 Guidance document on the strict protection of animal species of community interest under the Habitats Directive 92/43/EEC.
2. Woodley, T. H. and Read, A. J. 1991 Potential rates of increase of a harbor porpoise (*phocoena-phocoena*) population subjected to incidental mortality in commercial fisheries. *Canadian Journal of Fisheries and Aquatic Sciences*, **48**, pp. 2429-2435.
3. Wade, P. R. 1998 Calculating limits to the allowable human-caused mortality of cetaceans and pinnipeds. *Marine Mammal Science*, **14**(1), pp. 1-37.
4. Morton, A. B. and Symonds, H. K. 2002 Displacement of *Orcinus orca* (L.) by high amplitude sound in British Columbia, Canada. *Ices Journal of Marine Science*, **59**, pp. 71-80.
5. Johnston, D. W. 2002 The effect of acoustic harassment devices on harbour porpoises (*Phocoena phocoena*) in the Bay of Fundy, Canada. *Biological Conservation*, **108**, pp. 113-118.
6. Carstensen, J., Henriksen, O. D. and Teilmann, J. 2006 Impacts of offshore wind farm construction on harbour porpoises: acoustic monitoring of echolocation activity using porpoise detectors (T-PODs). *Marine Ecology-Progress Series*, **321**, pp. 295-308.
7. Harwood, J. 2001 Marine mammals and their environment in the twenty-first century. *Journal of Mammalogy*, **82**, pp. 630-640.
8. Richardson, W. J., Finley, K. J., Miller, G. W., DAVIS, R. A. and Koski, W. R. 1995 Feeding, social and migration behaviour of bowhead whales, *Balaena mysticetus*, in Baffin Bay vs. the Beaufort Sea - regions with different amounts of human activity. *Marine Mammal Science*, **11**, pp. 1-45.
9. Hammond, P. S. & Macleod, K. 2006 *SCANS II - Report on Progress. Paper prepared for ASCOBANS 5th Meeting of the Parties, Netherlands, September, 2006. MOP5/Doc. 26.*
10. Wilson, B., Reid, R. J., Grellier, K., Thompson, P. M. and Hammond, P. S. 2004 Considering the temporal when managing the spatial: a population range expansion impacts protected areas-based management for bottlenose dolphins. *Animal Conservation*, **7**, pp. 331-338.