Irish Whale and Dolphin Group Review of the National Parks and Wildlife Service draft document

Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters

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Introduction and General Comments

The Irish Whale and Dolphin Group (IWDG) welcomes the National Parks and Wildlife Service review of the *Code of Practice for the Protection of Marine Mammals during Acoustic Seafloor Surveys in Irish Waters* published in 2007 and the opportunity to present our views through this consultation process. The *Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters* document is well prepared and thorough and we are pleased to see the mitigation of acoustic impacts on marine mammals has been extended to include other activities such as dredging, drilling and pile-driving. The department may in the future also consider other activities such as dumping of rock armour and trenching as potential sound sources.

A working group comprising IWDG Marine Mammal Observers with experience in mitigation during seismic surveys both in Irish and international waters and dredging, blasting and pile-driving were consulted on the review and examined the draft document *Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters*. The following is as a result of the IWDG working group review process.

The *Code of Practice for the Protection of Marine Mammals during Acoustic Seafloor Surveys in Irish Waters* published in 2007 went a considerable way towards effective management of the activities of seismic surveys in Irish waters in relation to the protection of marine mammals from noise. Since its publication numerous seismic surveys of different kinds have taken place within the Irish EEZ. Of primary concern to the IWDG working group were 2D, 3D and 4D seismic surveys which employ airgun arrays. These sound sources may be active in small geographical areas for weeks at a time, and their input of acoustic energy into the marine ecosystem is significant. This review document therefore addresses the activities of these seismic surveys as a priority in addition to commenting on other aspects of the draft document.

The IWDG would also like the department to include a second review process of the *Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters* within 5 years. We also wish to see the department critically examining MMO reports submitted under this Guidance Document to ensure full

compliance. This could be carried out independently with a representative sample of MMO Reports. We would also like to ensure transparency resulting in all MMO reports being available on request by interested parties within a reasonable time-frame.

Specific Comments on Draft Guidance Document

1. Line turns during seismic surveys

The *Code of Practice for the Protection of Marine Mammals during Acoustic Seafloor Surveys in Irish Waters* stipulates that soft starts and pre-soft start watches must take place during daylight hours during periods of good visibility to allow the MMO determine by visual means that the mitigation zone is free from marine mammals. In the event that a survey approaches the beginning of a survey line at night then they cannot instigate a soft start as the MMO is unable to make that determination. Seismic surveys are typically laid out in a series of parallel lines of equal length and equal distance apart, often with a smaller number of parallel cross lines arranged at right angles to the primary lines. When the survey vessel reaches the end of a line they normally stop the airguns and commence a line turn, and do not instigate the soft start for the next line until 20-40 minutes prior to the start of the next line. The *Code of Practice for the Protection of Marine Mammals during Acoustic Seafloor Surveys in Irish Waters* however also stipulates that providing there is no break in firing longer than five minutes then shooting can continue. Survey companies have therefore in many cases elected to “collect 2D data” during line turns outside of the survey grid therefore obviating the need to turn off the guns and avoiding the problem of carrying out watches for marine mammals at night.

This activity is allowable within the *Code of Practice for the Protection of Marine Mammals during Acoustic Seafloor Surveys in Irish Waters*, but results in greatly increased airgun activity during the course of a survey with the attendant disturbance and potential for injury of animals. ***The IWDG working group is totally opposed to this industry activity, and view it as completely unnecessary***. If a company requires additional data outside the survey grid this should be indicated at licence application stage, and should be subject to risk assessment and environmental impact assessment in the same way as the rest of the survey. An amendment to the *Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources*

in Irish Waters is proposed which will reduce the overall noise created during seismic surveys, while still offering a measure of protection to marine fauna.

2. Passive Acoustic Monitoring

The IWDG working group proposes that passive acoustic monitoring (PAM) be employed by all 2D, 3D and 4D seismic surveys using airguns to determine as far as possible that there are no marine mammals present in the mitigation zone prior to and during soft-starts throughout the hours of darkness and when visibility is reduced. The working group accepts that PAM is an imperfect system with well-established limitations. PAM cannot detect non-vocalising animals; it cannot detect some animals vocalising in a direction other than towards the hydrophones; it cannot detect some animals, such as harbour porpoises, at quite short ranges; it cannot detect animals vocalising outside the frequency range of the hydrophones, in particular large baleen whales; the system's current ability to establish range and localisation of animals is very poor; and identification of animals is often impossible.

Notwithstanding these limitations we believe that the use of PAM is preferable to the other available options. These include shooting all the way around the line turns, which is the *modus operandi* of seismic companies operating recently in Irish waters; reduction of sound output, effectively using a "whale gun" or mitigation gun", which is further discussed below; making no attempt at all to mitigate for marine animals during night-time operations other than the soft start procedure; or complete cessation of night-time shooting. While the last option would be highly desirable in a conservation context it is unlikely to be acceptable to the exploration industry.

3. Precautionary principle

It is also suggested that the precautionary principle be applied to any potential areas of conflict between the conservation of marine animals and the demands of the survey. In particular, estimates of range to animals have in the past been an area of conflict between MMOs and survey crew. We propose that in the event of any PAM detection of animals, whether aurally, via spectrogram or by click detector, which can be documented by screen grab or sound recording; that the precautionary principle be applied and the animal or animals are assumed to be within the mitigation zone.

This hard and fast approach removes any doubt or ambiguity about the correct course of action to be taken during seismic surveys.

4. Reduced output

The draft document suggests a reduced noise output of less than 170 dB re: 1Spa @1m in lieu of shut down during line turns. In practice this may be difficult using existing equipment. Seismic airguns typically operate at air pressures of 2000 psi, and there are technical difficulties associated with reducing the operating pressure. Reduced sound output can therefore be practically achieved only by reducing the number and/or capacity of the airguns employed. Modelling work has indicated that the predicted radius for a sound level of 170 dB in 1000 m of water is 120 m using a single 40 cubic inch gun (LGL, 2011), a distance far greater that the reference level of 1m suggested by the draft document. A mitigation gun or whale gun with an output of 170 dB re: 1µPa @1m may be technically feasible, but in our view its use constitutes the needless addition of sound energy to the marine ecosystem and should be avoided.

5. Shut-down policy

The *Code of Practice for the Protection of Marine Mammals during Acoustic Seafloor Surveys in Irish Waters* is clear that should cetaceans be detected within the mitigation zone during the soft-start period before the airguns are operating at full power then there should be a complete shutdown and an appropriate pre-watch and soft-start sequence instigated. The wording in the draft document is ambiguous on this issue and it needs to be cleared up. IWDG would recommend that the current requirement for shutdown if animals are detected within the mitigation zone be re-instated as it allows for the protection of animals not detected during the pre-soft start scan and which find themselves in the vicinity of the airguns. The IWDG working group further proposes a shut-down procedure for seismic surveys using airguns in the event that certain select animals are detected within the appropriate mitigation zone during full power operations. The cetaceans proposed to be included in this are all baleen whale species and sperm whales regardless of their activity, and any cetacean engaged in “logging” behaviour, defined by prolonged periods at the surface with little or no fluking activity and no directed movement (Parks et al., 2011). The *Code of Practice for the Protection of Marine Mammals during Acoustic*

Seafloor Surveys in Irish Waters, along with mitigation procedures for seismic surveys all over the world, relies on the assumption that cetaceans will react to harmful noise in their environment by removing themselves from the area. While in most cases this is likely to be true (Stone and Tasker, 2006), certain groups may be more vulnerable due to their inability to move quickly, or at all in some cases. Mothers with calves may have difficulty swimming away in time, and deep diving species recovering from oxygen debt following long dives (Kooyman and Ponganis, 1998; Tyack et al., 2006) may engage in logging behaviour and may also be unable to move away from the approaching noise source. There is anecdotal evidence of seismic vessels operating on full power towing the airguns through logging groups of long-finned pilot whales *Globicephala melas* which were unable to react. A shutdown procedure would protect vulnerable animals during the rare events when they encountered an operational seismic vessel, and would not otherwise impinge on the survey operations.

The following is a list of brief comments on the draft document to be considered in addition to the above.

6. Protected megafauna

Include the otter *Lutra lutra,* basking sharks *Cetorhinus maximus* and marine turtles in the list of protected animals. Change all references in the *Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters* to "protected marine megafauna" to reflect this.

7. Commencement of any operation covered by the draft document

Accepting the limitations of PAM and the advantages of visual watches in detecting protected megafauna then start-up of a new operation must always be in daylight hours with good visibility. This must be mandatory for all works. The use of PAM at night is not sufficient to provide monitoring when beginning new seismic exploration.

8. Shut downs during seismic surveys

If there is a break in sound output during production, revert to five minutes time period after which full pre-watch and soft-start procedures must be employed as per

the *Code of Practice for the Protection of Marine Mammals during Acoustic Seafloor Surveys in Irish Waters* rather than ten minutes as in the draft document.

9. Gun testing during seismic surveys

Individual gun tests must only be carried out by agreement with the MMO that the prescribed area is clear of marine megafauna. Testing of multiple guns must follow full soft start procedures. On no account may gun tests be used as a means to maintain constant firing through line turns during periods of darkness or poor visibility.

10. MMO placement during seismic surveys

MMOs for seismic surveys must be located on the source vessel and this should be clearly stated.

11. MMO fatigue

It is unnecessary to continuously monitor the area for 30 minutes after cessation in activity in any type of operation. It may prove onerous particularly when only one MMO is available. If operations are planned to continue for longer than 12 hours in any day then two MMOs are required to provide adequate cover. Planning must consider the requirements for MMOs and PAM operators according to the European Working Time Directive (2003). Where PAM is operational, at least two observers are required.

12. Documentation

There should a provision for the timely publication of MMO reports to ensure transparency of procedures and to ensure standards are kept. Records of marine mammal sightings should be submitted, ideally within the context of the whole report for quality assurance, to the National Biodiversity Data Centre (NBDC) for populating the Marine Mammal Database, in a format provided by the NBDC.

In the case that PAM is adopted, new reporting forms should include reference to PAM and distinguish between daylight and dark operations. In addition the Record of Operations sheet needs a new column to distinguish between Full Power and Start

of Line so that if the difference between them is more than five minutes it is flagged as an operational issue.

MMOs must be given a copy of the EIA and all documentation relating to licencing prior to the start-up of operations and with ample time to review them before operations commence. MMOs must be involved in a start-up meeting prior to commencement of operations and also be included in any relevant toolbox meetings throughout the survey.

13. MMO training

Clients should ensure that only those MMOs with the minimum requirements (JNCC course or equivalent and a minimum of six-week marine mammal survey experience at sea over a 3 year period) are contracted to operate in Irish waters. A definition of what constitutes relevant Marine Mammal Survey experience should be provided. The stipulation about European waters experience is not considered necessary.

14. Surveys incorporating multi-beam and side-scan sonar

Many surveys employ a range of sound-producing devices including multi-beam, side-scan sonar, chirps, boomers, sparkers etc. Mitigation should only be required where the operational frequency of these devices is within the detection range of cetaceans (0-250kHz). Clarification is required on start-up requirements where a device starts up while another device is already running. It is suggested that where different devices operate on the same frequency they can be started using a short ramp-up of 10 minutes, as long as another device has been running constantly. Where devices are operating on different frequencies, each should be subject to separate and independent pre-soft start scan and ramp up procedures as per the *Code of Practice for the Protection of Marine Mammals during Acoustic Seafloor Surveys in Irish Waters*.

Blasting, Dredging, Pile-driving and other sources of noise

15. Risk Identification

During Risk Identification, pilot studies to explore attenuation rate of blasting at specific sites may be required in order to ensure the radial distance of the Monitored Zone is appropriate. This especially applies to activities in a highly sensitive bay where surveys indicate a high degree of residency with the site being utilised for key ecological functions by a relatively small discrete population of cetaceans. To avoid undue impact this may involve modeling the effects of different sound sources. In the absence of detailed assessment of local attenuation rates we suggest a 5 km mitigation zone and blasting only to take place when sea state and visibility allow observation over this distance.

16. Dredging, drilling and pile-driving

The minimum radial distance to be clear of marine mammals for both dredging, drilling and pile-driving should be 500 m radial distance of the intended sound source, i.e. within the monitored zone in water depths <200m and 1000 m in water depths >200 m, consistent with the *Code of Practice for the Protection of Marine Mammals during Acoustic Seafloor Surveys in Irish Waters*. Also if there is a break in activity the duration that the monitored zone should be clear of marine mammals should be 60 minutes in water depths >200m. This is to ensure deep-diving species can be observed or detected by the MMO.

17. *MMO independence*

MMOs should be independent and neither client company nor geophysical company employees.

18. Use of language

Use of phrases throughout such as “should” must to be avoided where it could introduce ambiguity. More imperative language is suggested to avoid situations where any particular course of action is arguable on the basis of semantics.

References

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