

Proposed Geophysical Survey

Port of Dundee

European Protected Species Risk Assessment

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CONTROL SHEET

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European Protected Species Risk Assessment

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1.0 Introduction

- 1.1 Port of Dundee is proposing to undertake a capital dredge of the approaches to the Port of Dundee for the purposes of accommodating vessels through a wider tidal window, notably those associated with the construction and operation of offshore renewable energy installations.
- 1.2 A geophysical survey of the dredge footprint is proposed to provide information on the geology of the dredged material. It is recognised in JNCC Guidance¹ that sound generated from geophysical survey sources has the potential to cause injury to marine mammals and, therefore, have the potential to result in a deliberate injury offence to European Protected Species (EPS) as defined under UK Regulations². For this reason, an EPS Licence may be required for the undertaking of geophysical surveys. Where there is the possibility for disturbance to EPS, an EPS Risk Assessment must be carried out.

¹ JNCC Guidelines for Minimising the Risk of Injury to Marine Mammals from Geophysical Surveys, August 2017

² Regulation 41(1a) of the Conservation of Habitats and Species Regulations 2012; Regulation 39(1a) of the Conservation

(Natural Habitats, &c.) Amendment (Scotland) Regulations 2012; Regulation 34(1a) of the Conservation (Natural Habitats, &c.)

(Amendment) Regulations (Northern Ireland) 2015; Regulation 39(1a) of the Offshore Marine Conservation (Natural Habitats &c.)

Regulations 2007 (as amended); Regulation 10(a) of the Offshore Petroleum Activities (Conservation of Habitats) Amendment

Regulations 2007.

2.0 Determining the Need for a Marine EPS Licence

2.1 The purpose of the EPS Risk Assessment is to determine whether, following the implementation of an appropriate mitigation strategy, there is the potential for the proposed geophysical survey activities to cause deliberate harm or inadvertent disturbance to EPS. Consideration of whether a Marine EPS Licence can be granted comprises three tests:

1. To ascertain whether the licence is to be granted for one of the purposes specified in Regulation 44(2) of the Conservation (Natural Habitats) Regulations 1994 (as amended in Scotland) ('the Habitat Regulations');
2. To ascertain whether there are no satisfactory alternatives to the activity proposed (that would avoid the risk of offence); and
3. That the licensing of the activity will not be detrimental to the maintenance of the populations of the relevant species at Favourable Conservation Status (FCS);

2.2 These tests are considered further in this Risk Assessment.

3.0 Geophysical Survey Methodology

3.1 The footprint of the geophysical survey is shown on Drawing Number 153333/G/SK0002. At present, the exact nature of the geophysical survey equipment to be used is unknown; however, for the purposes of this EPS Risk Assessment it has been assumed that the methodologies employed may include one or a combination of the following:

- Sub-bottom profiler (SBP), with a frequency range of 400Hz to 22kHz;
- Multibeam Echo Sounder (MBES), with a source sound emission of 200kHz to 400kHz; and
- Side scan sonar (SSS), with a minimum frequency of 400 kHz.

3.2 For the purposes of this EPS RA, it has been assumed that the above methods have the potential to cause sounds within cetacean hearing range (of less than 100kHz, as noted in the Joint Nature Conservation Committee Guidelines³).

3.3 The geophysical survey would be undertaken between July 2023 – December 2023. However, the geophysical survey will only be undertaken over a very short time period of no more than 5 days within that overall period.

³ JNCC Guidelines for Minimising the Risk of Injury to Marine Mammals from Geophysical Surveys, August 2017

4.0 EPS Presence in the Survey Area

4.1 Based upon a review of existing literature surrounding marine EPS⁴, there are four marine EPS with the potential to be present in the vicinity of the Port of Dundee: bottlenose dolphin *Tursiops truncatus*, white beaked dolphin *Lagenorhynchus albirostris*, harbour porpoise *Phocoena phocoena*, and minke whale *Balaenoptera acutorostrate*. The geophysical survey falls within Block R of the SCANS-III survey⁵.

Bottlenose Dolphin

The bottlenose dolphin SCANS-III densities for the relevant survey Block R is 0.030/km² and the reference population for the Coastal East Scotland (CES) Management Unit is 224⁶.

White Beaked Dolphin

The white-beaked dolphin SCANS-III densities for the relevant survey Block R is 0.243/km² and the reference population for the Celtic and Greater North Sea (CGNS) Management Unit is 43,951⁶.

Harbour Porpoise

The harbour porpoise SCANS-III densities for the relevant survey Block R is 0.599/km² and the reference population for the North Sea (NS) Management Unit is 346,601⁶.

Minke Whale

The minke whale SCANS-III densities for the relevant survey Block R is 0.039/km². The reference population for the (CGNS) Management Unit is 20,118⁶.

⁴ Regional baselines for marine mammal knowledge across the North Sea and Atlantic areas of Scottish waters - <https://data.marine.gov.scot/dataset/regional-baselines-marine-mammal-knowledge-acrossnorth-sea-and-atlantic-areas-scottish>

⁵ Small Cetaceans in the European Atlantic and North Sea (SCANS-III) <https://synergy.standrews.ac.uk/scans3>

⁶ Updated Abundance Estimates for Cetacean Management Units in UK Waters (Revised 2022), IAMMWG, March 2022

5.0 Assessment of Potential Impact

Multi-Beam Echo Sounder

- 5.1 JNCC Guidelines⁷ stipulate that the higher frequencies typically used in multi-beam surveys in shallower waters (<200m) fall outside the hearing frequencies of cetaceans and the sounds produced are likely to attenuate more quickly than the lower frequencies used in deeper waters. JNCC do not, therefore, advise that mitigation is required for multi-beam surveys in shallow waters. Therefore, should the geophysical survey be undertaken with the use of a multi beam echo sounder then there is no predicted impact on EPS.

Side Scan Sonar

- 5.2 As the frequencies used in side scan sonar are at a higher frequency than Multi-Beam Echo Sounder, it is outside of the cetacean hearing range and sounds are likely to attenuate quickly due to the high frequencies. As a result, mitigation is not required in shallow water for the use of SSS. Therefore, should the geophysical survey be undertaken with the use of SSS then there is no predicted impact on EPS.

Sub-Bottom Profiler

- 5.3 SBP can operate at frequencies within cetacean hearing ranges, with recorded amplitudes of up to 209 dB re 1 Pa RMS @ 1m⁸ which exceeds the permanent injury thresholds of 202 dB SPL peak for harbour porpoise, 219 dB SPL peak for whale species, and 230 dB SPL peak for dolphin species^{9 10}. Modelling^{9 10} indicates that the onset of permanent loss of hearing sensitivity (Permanent Threshold Shift

⁷ JNCC guidelines for minimising the risk of injury to marine mammals from geophysical surveys, August 2017

⁸ JNCC, Natural England and the Countryside Council for Wales, 2010. The protection of marine European Protected Species from injury and disturbance.

⁹ Southall, B.L., Finneran, J.J., Reichmuth, C., Nachtigall, P.E., Ketten, D.R., Bowles, A.E., Ellison, W.T., Nowacek, D.P. and Tyack, P.L., 2019. Marine mammal noise exposure criteria: updated scientific recommendations for residual hearing effects. *Aquatic Mammals*, 45(2), pp. 125-232.

¹⁰ National Marine Fisheries Service (NMFS), 2018. 2018 Revisions to: Technical Guidance for assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing (Version 2.0): Underwater Thresholds for Onset of Permanent and Temporary Threshold Shift.

(PTS)) in harbour porpoise could occur up to 23m from the source location (an area of 0.0017km² around a point source), based on a PTS cumulative threshold of 155dB SEL weighted^{9 10}. As harbour porpoise has the lowest injury threshold, permanent injury impact ranges for all other cetacean species are expected to be less than 23m from the source (i.e. within a 23m radius from source (0.0017km²).

- 5.4 Most of the sound energy generated by the SBP equipment will be directed towards the seabed and the pulse duration is extremely short, limiting the potential for injury. An animal would need to remain in the very small zone of ensonification for a prolonged period, which is highly unlikely⁸. However, localised short-term behavioural impacts, such as avoidance, may occur as a result of disturbance.
- 5.5 The current guidance for assessing the significance of noise disturbance against Conservation Objectives of harbour porpoise SACs¹¹ recommends the use of an effective deterrence radius of 5km for geophysical surveys. Therefore, on a precautionary basis, it has been assumed that all cetaceans within 5km of the survey source (an impact area of 78.5km² around a point source) could be at risk of disturbance. Due to the width of the river at the survey location, and to provide a more realistic potential disturbance area on which to base the assessments, an area of 31.4km² has been used (to account for at least 60% of the potential disturbance area overlapping with land). For PTS, and to adopt a precautionary approach, no reduction of the area of 0.0017km² identified in Paragraph 5.3 has been applied to accommodate for any overlapping with land.

¹¹ JNCC, DAERA and Natural England, 2020. Guidance for assessing the significance of noise disturbance against Conservation Objectives of harbour porpoise SACs (England, Wales & Northern Ireland). June 2020.

5.6 Consequently, the potential number of individuals calculated to be at risk of disturbance is based on the density estimates described in Section 4 which provides the following potential number of individuals:

Species	Potential Number of Individuals to be at risk of the onset of PTS (Impact Area of 0.0017km²)	Potential Number of Individuals to be at risk of Disturbance (Impact Area of 31.4km²)
Bottlenose Dolphin	0.000051	0.94
White Beaked Dolphin	0.00041	7.63
Harbour Porpoise	0.00102	18.8
Minke Whale	0.000066	1.22

Bottlenose Dolphin

5.7 The number of bottlenose dolphin that could potentially be at risk of the onset of PTS from the geophysical survey represents approximately 0.00002% of the CES Management Unit. The number of bottlenose dolphin that could potentially be disturbed due to the geophysical survey represents approximately 0.42% of the CES Management Unit. There is, therefore, negligible risk of injury or disturbance to the bottlenose dolphin population.

White Beaked Dolphin

5.8 The number of white-beaked dolphin that could potentially be at risk of the onset of PTS from the geophysical survey represents approximately 0.0000009% of the CGNS Management Unit. The number of white-beaked dolphin that could potentially be disturbed due to the geophysical survey represents approximately 0.017% of the CGNS Management Unit. There is, therefore, negligible risk of injury or disturbance to the white-beaked dolphin population.

Harbour Porpoise

- 5.9 The number of harbour porpoise that could potentially be at risk of the onset of PTS from the geophysical survey represents approximately 0.0000003% of the NS Management Unit. The number of harbour porpoise that could potentially be disturbed due to the geophysical survey represents approximately 0.005% of the North Sea Management Unit. There is, therefore, negligible risk of injury or disturbance to the harbour porpoise population.

Minke Whale

- 5.10 The number of minke whale that could potentially be at risk of the onset of PTS from the geophysical survey represents approximately 0.0000003% of the CGNS Management Unit. The number of minke whale that could potentially be disturbed due to the geophysical survey represents approximately 0.006% of the CGNS Management Unit. There is, therefore, negligible risk of injury or disturbance to the minke whale population.

6.0 Mitigation Strategy

6.1 As noted in Chapter 3, the survey equipment to be used has not yet been defined; therefore, the use of SBP has been proposed to inform this EPS Risk Assessment as a worst-case scenario.

6.2 If the survey equipment to be used has a sound output of 202 dB SPL_{peak} or above, and a frequency of 100 kHz or below, then the following mitigation measures, as outlined in the JNCC guidelines¹², will be implemented:

- The survey equipment used will use the lowest practical noise levels;
- As the geophysical survey will be carried out over a very short period of time (likely no more than five days) and will use low energy sources (such as SBP), a non-dedicated Marine Mammal Observer (MMO) will be employed. A non-dedicated MMO refers to a trained MMO who may undertake other roles on the vessel when not conducting their mitigation role. This person can be a member of the vessel's crew provided that, during the mitigation period, does not undertake any other roles on the vessel;
- A pre-survey search of the mitigation zone (of 500m from the acoustic source) will be undertaken prior to the geophysical survey commencement, for a period of at least 30 minutes, by an MMO (pre-survey searches only to be undertaken in daylight and in good visibility);
- If a marine mammal is sighted within the 500m mitigation zone during the pre-survey search, the survey commencement will be delayed until the mitigation zone has been clear of marine mammals for a period of at least 20 minutes, and the pre-survey search has been completed;
- A soft-start procedure will be undertaken (wherever practical) once the mitigation zone has been clear for 20 minutes, and the pre-survey search has been completed, with a gradual and consistent ramp-up of power over a minimum 15-minute period, and the line must be commenced within 25

¹² JNCC guidelines for minimising the risk of injury to marine mammals from geophysical surveys, August 2017

minutes of the start of the soft-start procedure. Once soft-start has commenced, there is no requirement to stop or delay the acoustic survey;

- If a line change is expected to take more than 40 minutes, the geophysical survey will be halted at the end of the survey line, and a full pre-survey search and soft-start procedure will begin prior to the next line.

7.0 Consideration of Cumulative Impacts

The current guidance for assessing the significance of noise disturbance against Conservation Objectives of harbour porpoise SACs¹³ recommends the use of an effective deterrence radius of 5km for geophysical surveys. On this basis, the Marine Licence online register has been reviewed to ascertain any other existing European Protected Species licenses within 5km of the Port of Dundee where work is permitted to take place at the same time as that proposed at the Port of Dundee (i.e. before 31 December 2023). At the time of writing, June 2023, there are no European Protected Species licences within 5km which have been granted and remain valid during the same time as works could be undertaken at the Port of Dundee. The nearest EPS Licence (EPS/BS-00010172) is for a Geophysical Survey approximately 25km up river from the Port of Dundee. There is a marine licence application (reference 00010338) pending determination for the maintenance of the Tay Road Bridge. However, no in water working is proposed as part of this application so no cumulative effects are predicted. Regardless, given the very short and temporary nature of the geophysical survey and the adherence to the recommended mitigation measures, no cumulative impacts are expected to arise that would affect the conservation status of any EPS.

¹³ JNCC, DAERA and Natural England, 2020. Guidance for assessing the significance of noise disturbance against Conservation Objectives of harbour porpoise SACs (England, Wales & Northern Ireland). June 2020.

8.0 Assessment of Potential Offence

- 8.1 The purpose of the Risk Assessment is to determine whether, when considering appropriate mitigation as presented in Chapter 6, there is still potential for the survey activities to cause deliberate harm, or inadvertently cause disturbance to EPS. The need for a Marine EPS Licence will be determined by Marine Scotland, with advice from NatureScot, based on findings from this Risk Assessment.
- 8.2 Fairhurst consider that based upon the impact assessment for the planned survey activities and the mitigation measures that will be applied, the risk of injury to EPS is considered to be negligible and therefore it is proposed that an EPS licence is not required for injury under The Conservation (Natural Habitats, &c.) Regulations 1994 (as amended) (inshore waters, <12 nm).
- 8.3 With regards to disturbance, there is a low potential of disturbance to a limited number of individuals of EPS within Scottish inshore waters (<12 nm). Therefore, an EPS licence is required for disturbance under The Conservation (Natural Habitats, &c.) Regulations 1994 (as amended). It is noted that the disturbance effects will be temporary and localised to a transient source, which will only be operational for a maximum of five days. Considering the nature and magnitude of likely effects described here, including the estimated low numbers of animals disturbed which represent small proportions of their wider populations, the proposed survey activities will not result in detrimental effects on the long-term maintenance of populations of cetaceans, their range or habitats. Consequently, it is concluded that there will be no impact on the favourable conservation status of any European Protected Species. Nevertheless, Marine Scotland's consideration of whether an EPS Licence can be granted will comprise the following three tests.

Test 1 - The licence must relate to one of the purposes referred to in Regulation 44(2)

- 8.4 The Scottish Government can only issue licenses under Regulation 44(2) of the Regulations (as amended) for specific purposes. These purposes include:

- 44(2)(e) preserving public health or public safety or other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment.
- 8.5 Offshore wind is a key growth sector in Scotland, and the generation and development of offshore wind infrastructure is a key component for reaching Scotland’s target to reduce greenhouse gas emissions (by 75% by 2030), and for being net-zero by 2045. Part of the next round of offshore wind development in Scotland is to ensure that 25% of the offshore wind industry is provided by local business.
- 8.6 The Port of Dundee is ideally situated to support the offshore renewables industry and the capital dredge of the approaches to the Port of Dundee is necessary for the purpose of accommodating vessels associated with renewable offshore energy installation through a wider tidal window, thereby improving the efficiency of the port and its throughput.

Test 2 – There must be no satisfactory alternative

- 8.7 The geophysical survey is required to detail the seabed characteristics and is required to provide sufficient detail for the design phase of the project. Although there might be different types of survey equipment that could be used, this is often constrained by the specific purpose of the geophysical survey and the alternative equipment may not be effective. Site investigation works are required in order to detail the seabed and sub-surface characteristics within the survey area. These works are required to provide sufficient detail to inform the scope of the capital dredging. However, it is important to note:
- Survey Location, Duration and Extent: the smallest survey area possible has been proposed. The smallest number of survey lines within this area and minimum survey duration possible has been determined. Reducing the size of the survey area and/ or the number of survey lines any further would provide insufficient data.

- **Survey Equipment/Methodology:** the combination of the level of geophysical survey and intrusive geotechnical site investigations have been chosen to provide the most efficient dataset that can be used to assess engineering and environmental feasibility. The design of the survey considers the provision of the required data but without survey techniques which may be superfluous for the current objectives. For future site investigation, it will provide data to allow the design of the most effective surveys. Overall, the methodologies will meet the objectives of the survey with the minimal practicable impact to EPS.

Do Nothing

- 8.8 The key purpose of the project is to accommodate vessels associated with renewable offshore energy installation through a wider tidal window, thereby improving the efficiency of the port and its throughput. There are no historic ground investigation or survey records that could be used to inform the design of the project. Geophysical surveys are essential for effective project design, safety and appropriate determination of project risks. Therefore, the 'Do Nothing' option has not been considered further.

Alternative Survey Techniques

- 8.9 With regard to geophysical surveys, the only way to obtain the required resolution of surface ground conditions, without the use of a geophysical survey, would be to undertake an extremely detailed geotechnical investigation. This would include taking a series of marine boreholes throughout the proposed dredge area, which would result in extended survey durations and, more likely, increased disruption to marine mammals due to a geotechnical investigation taking longer than the 5 days proposed for the geophysical survey. In addition, this option would require increased disruption to the operation of the Port of Dundee. This option is not justified by the increased risk posed to marine mammals and the increased disruption to the Port of Dundee.

- 8.10 Thus, Port of Dundee considers that the 'no satisfactory alternative test' has been met.

Test 3: The action authorised must not be detrimental to the maintenance of the population of the species concerned at FCS in their natural range (Regulation 44(3b)).

- 8.11 The percentage of the reference population of EPS that may experience disturbance is considered to be negligible in all cases (i.e. less than 1% of the reference population impacted). As such, disturbance during the surveys is not considered detrimental to the maintenance of the populations or achievement of Favourable Conservation Status.

9.0 Conclusion

- 9.1 The capital dredge associated with the geophysical survey is an important part of Port of Dundee's aspirations to support Scotland's growing contributions to the UK's renewable energy sector.
- 9.2 It is possible that a small number of individuals may experience minor disturbance during the period in which they may encounter noise emissions from survey operations. Given the very short-term impacts (likely no more than five days), and the implementation of industry recognised mitigation measures described in Paragraph 6.2 of this Risk Assessment, it is considered that there is no potential for significant impact on the wider populations of EPS such as harbour porpoise, bottlenose dolphin, minke whale, and white-beaked dolphin and that there will be no impact on the conservation status of any EPS. Therefore, disturbance will not be sufficient to cause any population level effects, and thus it is considered that a Marine EPS Licence to disturb can be issued.

10.0 References

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