Natura Impact Statement

Non-invasive visual and acoustic ROV/AUV surveys of ten shipwreck sites, South Coast of Ireland (Counties Cork, Waterford and Wexford)

Maritime Usage Licence Application MUL260003

Prepared for submission to MARA under section 117(6)(a) of the Maritime Area Planning Act 2021 to enable Appropriate Assessment under Regulation 42 of S.I. 477 of 2011

Item	Detail
Applicant	Oceyon AG, Grafenauweg 8, 6300 Zug, Switzerland
Authorised contact	Kim Hind, Head of Operations – kim.hind@oceyon.com
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Prepared by	Kim Hind

Contents

1. Introduction

2. Methods and guidance

3. Description of the proposed maritime usage

4. European sites screened in for Appropriate Assessment

5. Assessment of potential effects

6. In-combination effects

7. Mitigation measures

8. Transboundary effects

9. Residual effects

10. Assessment of effects on site integrity with mitigation

11. Natura Impact Statement conclusion

12. References

1. Introduction

1.1 Background

Oceyon AG (Oceyon) has applied to the Maritime Area Regulatory Authority (MARA) under section 117 of the Maritime Area Planning Act 2021 (the MAP Act) for a Maritime Usage Licence (MUL) to carry out non-invasive visual and acoustic surveys of ten shipwreck sites off the coasts of Counties Cork, Waterford and Wexford (application MUL260003, received by MARA on 06/02/2026). The surveys will use remotely operated vehicles (ROVs) and, where required, an autonomous underwater vehicle (AUV) launched from a single small vessel. No divers will be used and no equipment will be placed on or taken from the seabed.

Oceyon develops deep-learning technology that turns survey data into 3D and other models of underwater structures. The technology has been tested in Swiss alpine lakes. The purpose of the proposed surveys is to test and refine the technology in saline water in the North Atlantic, using ten wrecks as test targets. The resulting models and public data analysis on heritage assets will support understanding of the condition of the wrecks, and results will be shared with wreck owners and the Department of Housing, Local Government and Heritage (Wreck Unit).

1.2 Regulatory context

MARA has determined that an Environmental Impact Assessment is not required, as the usage is not of a class listed in Schedule 5 of the Planning and Development Regulations 2001 (EIA screening dated 15/09/2026 and recorded 07/10/2026).

The application was then screened for Appropriate Assessment under Regulation 42 of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477 of 2011). The Appropriate Assessment Screening and Determination Report (29/09/2026; decision signed 07/10/2026; the Determination Report), to which this NIS responds, concluded that Stage 2 Appropriate Assessment is required because it cannot be excluded, on the basis of objective scientific information, that the proposed usage, individually or in combination with other plans or projects, will have a significant effect on a European site. The Determination Report identified underwater noise disturbance as the principal pathway, noting that marine mammals and diving seabirds associated with European sites may occur within the zone of influence, and that the Daru wreck lies at the very edge of the Seas off Wexford Special Protection Area (SPA).

By notice dated 07/10/2026 under section 117(6)(a) of the MAP Act, MARA requires Oceyon to prepare a Natura Impact Statement (NIS) by 04/11/2026. This document is that NIS.

1.3 Purpose and structure of this NIS

This NIS provides the information required to carry out the Appropriate Assessment. It: describes the proposed maritime usage and its acoustic characteristics (Section 4); identifies the European sites and features screened in (Section 5); assesses potential effects on those features in view of their site-specific conservation objectives (Section 6); considers in-combination effects (Section 7); sets out mitigation measures (Section 8); and states the conclusion on adverse effects on site integrity (Sections 11 and 12).

The Determination Report records that no mitigation measures were considered at the screening stage. Consistent with the case law of the Court of Justice of the European

Union, mitigation measures are therefore presented and relied upon in this Stage 2 assessment, in Section 8.

1.4 Supporting documents

This NIS draws on the following documents submitted with, or issued in respect of, application MUL260003:

- Oceyon MUL application form (Form MUL1), dated 08/01/2026, and the Survey Programme and Duration statement (Attachment 3.3).
- Proposed MUL Map and GIS files (Attachments 3.4 and 3.5).
- Rowan Engineering Consultants (2025). Supporting Information for Screening for Appropriate Assessment Report, OCE0001-1, R01 (Attachment 4.3).
- Rowan Engineering Consultants (2025). Assessment of Annex IV Species Report, OCE0001-1, R01 (Attachment 4.4) (the *Annex IV Report*).
- Rowan Engineering Consultants (2025). Supporting Information for AIMU, OCE0001-1, R01.
- MARA (2026). Appropriate Assessment Screening and Determination Report, MUL260003 (the *Determination Report*).

2. Methods and guidance

2.1 Legislation and guidance

This report has been prepared with reference to the following legislation, guidance and case law on Appropriate Assessment under Article 6(3) and (4) of the Habitats Directive:

- Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (the Habitats Directive).
- Directive 2009/147/EC on the conservation of wild birds (the Birds Directive).
- European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011), as amended, in particular Part 5.
- Maritime Area Planning Act 2021, in particular sections 117 and 121.
- European Commission (2018). Managing Natura 2000 sites: the provisions of Article 6 of the Habitats Directive 92/43/EEC.
- European Commission (2021). Assessment of plans and projects in relation to Natura 2000 sites – Methodological guidance on Article 6(3) and (4) of the Habitats Directive 92/43/EEC (2021/C 437/01).
- Office of the Planning Regulator (2021). Appropriate Assessment Screening for Development Management, OPR Practice Note PN01.
- Department of the Environment, Heritage and Local Government (2010). Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities.
- Department of Arts, Heritage and the Gaeltacht (2014). Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters (the *NPWS (2014) Guidance*).
- MARA (2025). Guidance Note for Applicants applying for a Maritime Usage Licence (MUL), Version 7, 05/11/2025.
- Case C-127/02 *Waddenzee* (7 September 2004); Case C-258/11 *Sweetman* (11 April

2013); Case C-323/17 *People Over Wind and Sweetman* (12 April 2018).

2.2 Approach to the assessment

The assessment follows the source–pathway–receptor approach used in the Determination Report. The zone of influence (ZoI) was established for each pathway (Section 4.7). For every European site and feature screened in, the assessment asks whether the proposed usage, alone or in combination with other plans or projects, could adversely affect the integrity of the site, meaning its ability to maintain the favourable conservation condition of the feature for which it is designated, as defined by the attributes and targets in the NPWS site-specific conservation objectives.

A conclusion of no adverse effect on integrity is reached only where, in light of the best scientific knowledge, no reasonable scientific doubt remains. Mobile qualifying interests (QIs) and special conservation interests (SCIs) are assessed on a precautionary basis irrespective of the distance between their designated site and the survey locations, because individuals associated with a site may range widely. Where uncertainty remains, the precautionary principle has been applied.

3. Description of the proposed maritime usage

3.1 Overview

The proposed maritime usage comprises non-invasive photographic and acoustic surveys of ten shipwreck sites, 2 to 25 nautical miles off the coast in water depths of approximately 27 m to 110 m. An electrically powered ROV will be deployed at each site and an AUV will be deployed only where required. The vehicles will approach the wreck and remain at a stand-off altitude from the seabed; there is no landing on the seabed, no sampling, no excavation or coring, no divers and no deployment of equipment on the seabed. The wrecks are existing structures and the survey is a temporary, mobile activity that leaves no infrastructure in place.

3.2 Survey sites

The ten survey sites are listed in Table 1. They comprise five named wrecks (SS East Wales, SS Minnehaha, SS Ben Lomond, SS Pinewood and MV Daru), one unidentified submarine and four other unidentified wrecks. Positions are taken from the geometry of the GIS file submitted as Attachment 3.4 (ETRS89 / UTM zone 29N, converted here to WGS84) and are approximate to four decimal places. Site IDs follow the submitted GIS file (there is no feature 5).

ID	Wreck	Latitude (°N)	Longitude (°W)	Depth (m)	Length × width (m)	Distance offshore (nm)	Relationship to European sites
1	Unidentified wreck	51.9623	7.3120	49.9	106 × 19	10	–
2	Unidentified wreck	51.7480	7.3677	66.6	78 × 10.5	17	–
3	Unidentified wreck	51.6627	7.8290	73.0	153.7 × 28	12	–
4	SS East Wales	51.5842	8.2628	71.5	118 × 26.8	8	–
6	SS Minnehaha	51.3005	9.3477	71.7	185 × n/a	9	–
7	Unidentified wreck	51.2610	9.2197	110.4	35.5 × 8.2	14	–
8	SS Ben Lomond	51.4784	7.6122	74.0	96 × 17	25	–
9	SS Pinewood	51.8407	7.5845	61.2	100 × 19	8	–
10	Unidentified submarine	51.7513	8.2152	27.0	45 × 8	2	–
11	MV Daru	51.9699	5.9374	88.7	113 × 15	20	At the very edge of Seas off Wexford SPA [004237]

Table 1. Survey sites *Source: MUL_survey_locations.gpkg (Attachment 3.4). The relationship column reflects the finding of the Determination Report that Daru is the only site overlapping a European site; no other site lies within a European site.*

Survey activity at each site is confined to the immediate vicinity of the wreck, that is, the wreck structure plus a margin of 1–2 m on all sides, as described in Oceyon's response to the National Monuments Service.

3.3 Vessel and ports

The surveys will be carried out from a single small chartered vessel, the Fionn Mac Cumhaill (or a similar vessel depending on availability), a 16 m aluminium crew transfer vessel. Up to five survey personnel plus crew will be on board. The vessel will operate in daylight hours only and return to port each day for refuelling, maintenance and the offloading of personnel and waste. Cork Harbour, Youghal and Wexford are the likely primary ports.

Parameter	Value	Parameter	Value
Vessel name	Fionn Mac Cumhaill	Tonnage	15.2 GT
Length overall	16.1 m	Beam / draft	4.0 m / 0.6 m
Hull	Marine-grade aluminium	Fuel	Diesel; 120 litres per hour
Maximum speed	25 knots	Maximum wave height	1.5 m Hs
Certification	MSO P5 and MCA Category 2	Capacity	12 passengers, 2 crew

Table 2. Proposed survey vessel *Source: Rowan Engineering Consultants (2025), Table 2-2.*

3.4 Survey equipment and acoustic characteristics

The ROVs and AUV carry the positioning, navigation and imaging sensors listed in Table 3, together with video and still cameras. Underwater positioning of the ROVs is by a SeaTrac ultra-short baseline (USBL) system, with a transceiver on the vessel and a transponder on

the ROV. Source levels are those reported in the Annex IV Report (taken from manufacturer information), except for the USBL, where the maximum of 186 dB re 1 µPa @ 1 m given in the Determination Report is adopted as a precautionary value (the manufacturer's figure quoted in the Annex IV Report is 170–174 dB).

Platform	Source	Frequency	Source level (dB re 1 µPa @ 1 m)	Within hearing range of any marine mammal?
Vessel	Engine and propulsion noise (Fionn Mac Cumhaill)	Broadband, mainly 50 Hz – 2 kHz	170–180 at transit speed; lower on station	Yes
Vessel / ROV	SeaTrac USBL transceiver and transponder	24–32 kHz	170–174 (manufacturer); 186 adopted as maximum	Yes (cetaceans and seals)
ROV 1	Sonoptix obstacle-avoidance sonar	400 and 700 kHz	180–193	No
ROV 1	Tracker 650 Doppler velocity log (DVL)	650 kHz	199–207	No
ROV 1	Omniscan side-scan sonar	450 kHz	205–207	No
ROV 2	Oculus imaging sonar	750 and 1,200 kHz	183–194	No
ROV 2	Nortek 500 DVL	500 kHz	198–206	No
AUV (as required)	Side-scan sonar (Seaber Yuco-Scan or similar)	400–900 kHz (650 kHz)	180–190	No

Table 3. Underwater acoustic sources associated with the proposed usage *Sources: Rowan Engineering Consultants (2025), Annex IV Report, Sections 2.1.1 and 5.2; Determination Report, Section 2.1. The audibility column is derived in Section 6.2.*

All ROV and AUV propulsion is electric. The sensors operate in a downward- or forward-looking, narrow-beam configuration directed at the wreck and the seabed rather than into open water.

3.5 Survey operations

The survey method, which is the same at each wreck, is described in the Survey Programme and Duration statement (Attachment 3.3) and summarised below.

- Equipment and personnel are mobilised onto the vessel in port and the equipment is tested before departure. The vessel departs early in the morning, in daylight, for the wreck location.
- On arrival, the marine mammal observer (MMO) checks for marine mammal activity. Only when the MMO gives the all-clear is the ROV or AUV prepared for launch and the USBL positioning system deployed. Pre-dive checks are carried out at the same time provided no additional acoustic noise is generated.
- The ROV dives and approaches the seabed, remaining at a stand-off altitude. The sonar is used to locate the wreck. The ROV carries out a reconnaissance fly-over or fly-around at a safe distance, then the visual survey: a series of circuits of the vertical sections (hull) and lines across the top of the wreck (decks), with overlap between consecutive circuits or lines.
- The ROV is recovered to deck and secured and the vessel returns to port. The data

are checked overnight. If more data are needed, the vessel returns to the wreck and repeats the process.

- When the campaign is complete the data are checked again and all project equipment and personnel are demobilised.

3.6 Programme and duration

Each wreck will take about one day, including transit, and not more than two days at any one site if weather or data quality require a return visit. The total campaign is approximately 14 days within a two- to three-week period, depending on weather and vessel availability. Oceyon has applied for a two-year licence to allow the campaign to be scheduled in a suitable weather window (spring or autumn). Survey activity at any site is therefore temporary, of short duration, and occurs in a single campaign.

3.7 Zone of influence

The zones of influence adopted for this assessment are:

- **Underwater noise:** a radius of 500 m around each survey location, which is the Monitored Zone defined in the NPWS (2014) Guidance and which exceeds the predicted disturbance ranges for the audible sources (Section 6.2). For robustness, a bounding radius of 1.5 km is also considered, which exceeds the largest range obtained under any scenario assessed (approximately 1.4 km).
- **Vessel presence, above-water noise and visual disturbance:** the survey locations and the vessel transit routes between the ports and the sites.
- **Mobile species connectivity:** the foraging and movement ranges of the QIs and SCIs of the European sites screened in, assessed on a precautionary basis (Sections 6.3 and 6.4).
- **Accidental pollution:** limited to the immediate vicinity of the vessel, given the small fuel inventory and short duration.

The proposed usage involves no seabed disturbance, no discharges and no structures, and there is therefore no pathway to benthic habitat, water quality or sediment-dependent QIs of any European site.

4. European sites screened in for Appropriate Assessment

A large number of Special Areas of Conservation (SACs) and SPAs in the region were considered in the Determination Report, and the sites and features listed in Tables 4 and 5 were screened in, on the basis that mobile individuals associated with them may occur within the zone of influence and be exposed to underwater noise. All other European sites and features considered were screened out as having no significant source–pathway–receptor link, and are not assessed further. The proposed usage is not directly connected with or necessary to the management of any European site.

European site (code)	Distance from MUL area (km)	QI screened in	Reason (Determination Report)
Roaringwater Bay and Islands SAC [000101]	18.2	Grey seal [1364] Harbour porpoise [1351]	Mobile individuals may occur in the ZoI and be exposed to underwater noise
Hook Head SAC [000764]	19.7	Harbour porpoise [1351] Common bottlenose dolphin [1349]	As above
Carnsore Point SAC [002269]	31.8	Harbour porpoise [1351]	As above
Blackwater Bank SAC [002953]	36.2	Harbour porpoise [1351]	As above
Saltee Islands SAC [000707]	37.7	Grey seal [1364]	As above
Slaney River Valley SAC [000781]	48.1	Harbour seal [1365]	As above
Kenmare River SAC [002158]	86.2	Harbour porpoise [1351]	As above
Blasket Islands SAC [002172]	138.4	Harbour porpoise [1351]	As above

Table 4. SACs and qualifying interests screened in

European site (code)	Distance from MUL area (km)	SCI screened in	Reason (Determination Report)
Seas off Wexford SPA [004237]	0 (Daru wreck at the very edge of the SPA)	Shag [A018] Cormorant [A017] Red-throated diver [A001] Guillemot [A199] Manx shearwater [A013] Gannet [A016] Razorbill [A200]	Diving-bird SCIs may occur within the survey areas and be exposed while equipment is operating; insufficient species- and source-specific information at screening to exclude disturbance
Cork Harbour SPA [004030]	6.75	Cormorant [A017]	As above
Old Head of Kinsale SPA [004021]	27.0	Guillemot [A199]	As above
Saltee Islands SPA [004002]	47.5	Gannet [A016] Razorbill [A200]	As above
The Bull and The Cow Rocks SPA [004066]	68.9	Gannet [A016]	As above
Deenish Island and Scariff Island SPA [004175]	76.6	Manx shearwater [A013]	As above
Puffin Island SPA [004003]	93.7	Manx shearwater [A013]	Vessel activity and operation of acoustic equipment generate underwater sound; diving-bird SCIs may be exposed

Table 5. SPAs and special conservation interests screened in *Source: Determination Report,*

Table 1. Features in bold in that table are those screened in. Distances are from the proposed MUL area as reported in the Determination Report.

The potential impact pathways identified in the Determination Report (its Table 2) were: (i) underwater noise disturbance, which could cause temporary disturbance or displacement of mobile marine mammals and diving birds; and (ii) visual and above-water noise disturbance from the vessel, personnel and deployed equipment, for which likely significant effects were not anticipated given the single-vessel operation, the one-to-two-day duration at each offshore site and the absence of works at breeding or roosting locations. Both pathways are addressed in Section 6.

4.1 Relevance of the screened-in sites to the survey locations

The distances in Tables 4 and 5 are those reported in the Determination Report from the proposed MUL area as a whole, so each distance is measured from whichever of the ten survey sites is nearest. The sites fall into three geographical groups, and the screened-in sites relate to them as follows:

- **Waterford and east Cork coast (Sites 1, 2, 3, 4, 8, 9 and 10):** the nearest screened-in sites are Cork Harbour SPA (6.75 km), Roaringwater Bay and Islands SAC (18.2 km), Hook Head SAC (19.7 km) and Old Head of Kinsale SPA (27.0 km). Cork Harbour SPA lies close to Sites 4 and 10 and to the vessel transit routes from port.
- **West Cork (Sites 6 and 7):** these are the sites nearest to Roaringwater Bay and Islands SAC, and the only sites from which the more distant western sites could be reached by foraging animals: Kenmare River SAC, Blasket Islands SAC, The Bull and The Cow Rocks SPA, Deenish Island and Scariff Island SPA and Puffin Island SPA (68.9–138.4 km).
- **Wexford (Site 11, Daru):** this site lies at the very edge of Seas off Wexford SPA and is the nearest site to Carnsore Point SAC, Blackwater Bank SAC, Saltee Islands SAC and SPA and Slaney River Valley SAC.

The sites at 36 km and beyond are linked to the survey only through the foraging and movement ranges of mobile species (harbour porpoise, seals and seabirds). They are included because they were screened in on the basis of mobile-species connectivity, rather than because any survey location lies near them. The assessment in Section 6 shows that none is within any predicted effect range.

4.2 Sites screened out

The remaining sites in Table 1 of the Determination Report were screened out (including Ardmore Head SAC, Helvick Head SAC, Great Island Channel SAC, Blackwater River SAC, Ballycotton Bay SPA and the estuarine and wetland SPAs) because they have no source–pathway–receptor link to the proposed usage: their qualifying interests are habitats, otter, migratory fish, or terrestrial, cliff-nesting, wetland or surface-feeding birds. For completeness, five SPAs that were screened out list a diving-bird special conservation interest that is also screened in elsewhere: Sovereign Islands SPA (cormorant, 18.0 km), The Raven SPA (red-throated diver and cormorant, 48.8 km), Wexford Harbour and Slobs SPA (cormorant, 46.4 km), Keeragh Islands SPA (cormorant, 60.0 km) and Mid-Waterford Coast SPA (cormorant, 62.6 km). These are not assessed separately in this NIS, but the cormorant and red-throated diver assessments in Section 6.4 apply equally to them, and no effect on them is predicted.

5. Assessment of potential effects

5.1 Potential effect pathways

The following pathways have been considered for the QIs and SCIs screened in:

- **Underwater noise** from the survey vessel, the USBL positioning system and the ROV/AUV sonar and Doppler velocity log (DVL) sensors, with the potential for auditory injury, temporary threshold shift (TTS) or behavioural disturbance and displacement of marine mammals and diving seabirds (the principal pathway identified in the Determination Report).
- **Vessel presence, above-water noise and visual disturbance**, with the potential to displace seabirds and marine mammals (considered in the Determination Report as not likely to be significant, but addressed here for completeness).
- **Vessel collision** with marine mammals.
- **Accidental pollution** from the survey vessel, and **introduction of non-native species**.

There is no pathway to habitat QIs: no seabed contact, sampling, discharge or structure is involved, and no habitat QI was screened in.

5.2 Underwater noise

5.2.1 Approach

Because likely significant effects could not be excluded at screening in the absence of *species- and source-specific* information, the noise assessment has been structured around three questions for each source in Table 3: (i) is the source within the hearing range of the receptor group; (ii) if so, how far from the source could a disturbance or injury criterion be reached; and (iii) does that range overlap any European site or the habitat that forms part of a site's conservation objective attributes.

5.2.2 Hearing groups and criteria

Marine mammals are assigned to hearing groups, each with a generalised hearing range and auditory injury criteria (Southall et al., 2019). The criteria in Table 6 are expressed as weighted cumulative sound exposure level (SELcum, 24 hours) for non-impulsive sound and as unweighted peak sound pressure level for impulsive sound. The behavioural disturbance criterion applied is 160 dB re 1 µPa (rms), applied unweighted to all marine mammals as in the Annex IV Report (following Southall et al., 2007). This is a conservative approach because it ignores the frequency dependence of hearing.

Hearing group (species present)	Generalised hearing range	PTS – SELcum non-impulsive (dB re 1 µPa²s)	TTS – SELcum non-impulsive (dB re 1 µPa²s)	PTS – peak SPL impulsive (dB re 1 µPa)	Behavioural (dB re 1 µPa rms)
Low-frequency cetaceans (minke whale and other baleen whales)	7 Hz – 35 kHz	199	179	219	160
High-frequency cetaceans (bottlenose dolphin, common dolphin and other dolphins)	150 Hz – 160 kHz	198	178	230	160
Very high-frequency cetaceans (harbour porpoise)	275 Hz – 160 kHz	173	153	202	160
Phocid carnivores in water (grey seal, harbour seal)	50 Hz – 86 kHz	201	181	218	160

Table 6. Marine mammal hearing groups and auditory injury criteria *Source: Southall et al. (2019) for hearing ranges and injury criteria; behavioural criterion after Southall et al. (2007), as used in the Annex IV Report. PTS = permanent threshold shift; TTS = temporary threshold shift.*

5.2.3 Audibility of the survey sources

The upper limit of functional hearing for marine mammals is 160 kHz for the high-frequency and very high-frequency cetaceans, the groups with the highest-frequency hearing, and 86 kHz for seals. All of the ROV and AUV sensors in Table 3 (obstacle-avoidance sonar, imaging sonar, side-scan sonar and DVLs) operate between 400 kHz and 1,200 kHz, which is more than two and a half times higher than the upper hearing limit of any marine mammal group. These sources are therefore **not audible to any marine mammal** and cannot cause auditory injury, TTS or a behavioural response. The Annex IV Report reached the same conclusion (Section 5.6.3), noting that the majority of the survey equipment lies outside the hearing capabilities of any receptor likely to be present.

The sources that are within the hearing range of marine mammals are the **SeaTrac USBL (24–32 kHz)** and the **vessel's engine and propulsion noise**. The USBL band lies within the hearing range of the high-frequency and very high-frequency cetaceans and of phocid seals, and just below the upper limit of the low-frequency cetacean group (35 kHz).

5.2.4 Predicted ranges

Ranges to the 160 dB behavioural criterion were calculated for the audible sources. Two transmission loss models were applied: spherical spreading (20 log R) and the hybrid 15 log R model used in the Annex IV Report. For the USBL, cylindrical spreading (10 log R), the most conservative physical bound for shallow water, is also shown. Absorption is neglected, which is conservative at 24–32 kHz. For completeness, the table also shows the two highest source levels for the non-audible sonar and DVL sources, to demonstrate that the conclusions do not depend on the audibility argument.

Source	Source level (dB re 1 µPa @ 1 m)	Audible to marine mammals?	Spherical 20 log R (m)	15 log R (m)	Cylindrical 10 log R (m)
Vessel (transit speed, worst case)	180	Yes	10	22	100
SeaTrac USBL (maximum adopted)	186	Yes	20	54	398
Source level that reproduces the 293 m range reported in the Annex IV Report	197	No (400 kHz and above)	71	293	Not applicable
Highest quoted source level (DVL, side-scan sonar)	207	No (400 kHz and above)	224	1,359	Not applicable

Table 7. Predicted ranges to the 160 dB re 1 µPa (rms) behavioural criterion *Range R = 10^((SL − 160)/n) for n = 20, 15 and 10. The 15 log R results for 180 dB (22 m) and 197 dB (293 m) match the vessel and maximum marine mammal disturbance ranges in the Annex IV Report. The Annex IV Report's 293 m and 1,360 m ranges both correspond to a 197 dB source level in this model.*

For the two sources that are audible, the maximum disturbance range is 54 m (15 log R) and, under the most conservative cylindrical bound, 398 m for the USBL. Both are inside the 500 m Monitored Zone defined in the NPWS (2014) Guidance. Even if every sonar and DVL were audible, which they are not, the largest range obtained (about 1.4 km) is only about 7% of the distance from the MUL area to the nearest SAC designated for marine mammals (18.2 km, Roaringwater Bay and Islands SAC).

5.2.5 Auditory injury

The USBL source level (at most 186 dB re 1 µPa rms at 1 m) is well below the peak injury criteria in Table 6 for every hearing group, even allowing a generous 10 dB for the difference between peak and rms levels (about 196 dB peak, against a lowest peak criterion of 202 dB for the harbour porpoise group). The vessel's source level is far lower. The non-audible sources cannot cause injury. The Annex IV Report likewise concluded that no injury criterion is exceeded for any marine mammal or fish.

The USBL transmits brief, intermittent pulses and the vessel and ROV are mobile or hold position at only one location at a time. The accumulation of an injurious sound exposure would require an animal to remain within a short distance of the transceiver for a prolonged period, and then only for the most sensitive hearing group (harbour porpoise). Porpoises are shy of vessels and are known to avoid them. The mitigation in Section 8 (a 500 m Monitored Zone, a 30-minute pre-start watch and a ramp-up) is specifically designed to prevent this circumstance arising.

5.2.6 Behavioural disturbance

Behavioural responses to sound depend strongly on context and on the individual animal (Southall et al., 2007, 2019). Within the ranges in Table 7, a low-level, temporary behavioural response, such as short-term avoidance, is the most that could occur, and only for animals present within about 50 to 400 m of the USBL at the time it is operating. Disturbed animals would be expected to return to the area once operations at that site (generally no more than a day) have ended. The vessel noise contributed is within the range of noise from the existing commercial shipping, ferry and fishing traffic that is a feature of the south coast.

For harbour porpoise SACs, JNCC (2020) advises applying a fixed effective deterrence

range to assess disturbance against conservation objectives, which for geophysical surveys is 5 km. This is a precautionary ceiling for the Oceyon survey, because the USBL is a far lower-energy source than the geophysical sources on which that range is based. Even that range would not reach the nearest SAC (18.2 km).

5.2.7 Conclusion on underwater noise

Only the USBL and the vessel are audible to marine mammals. Their predicted disturbance ranges (at most about 54 m, or about 0.4 km under the most conservative bound) are small, temporary and localised, and lie wholly within the 500 m Monitored Zone. The remaining sources cannot be heard by marine mammals. No European site designated for marine mammals lies within any predicted range, and no site lies within 18.2 km of the survey locations.

5.3 Marine mammals

5.3.1 Harbour porpoise (Phocoena phocoena) [1351]

Harbour porpoise is a QI of Roaringwater Bay and Islands SAC (18.2 km), Hook Head SAC (19.7 km), Carnsore Point SAC (31.8 km), Blackwater Bank SAC (36.2 km), Kenmare River SAC (86.2 km) and Blasket Islands SAC (138.4 km). It is the most widespread and frequently recorded cetacean in Irish waters, occurring in the Celtic Sea throughout the year with density peaking in summer, usually in individuals or small groups of two to three, and tending to avoid vessels (Annex IV Report). Calving is concentrated in May and June.

Individuals associated with these SACs may use the waters around the survey sites for foraging. However, the audible sources produce effects only within a few hundred metres of a single location at a time, for up to two days per site, whereas the nearest SAC is more than 18 km from any part of the MUL area. The survey therefore cannot reduce the extent or availability of habitat within any SAC, cannot create a barrier to access to the SAC or to its supporting habitat outside it, and cannot cause disturbance within the SAC. The temporarily affected area at any one time (a circle of 500 m radius, approximately 0.8 km²) is very small relative to the continuous foraging habitat available along the south coast. On this basis, an adverse effect on the conservation objectives for harbour porpoise at any of the SACs is highly unlikely even without mitigation. With due regard to the precautionary principle and the screening conclusion, mitigation is nevertheless proposed (Section 8).

5.3.2 Common bottlenose dolphin (Tursiops truncatus) [1349]

Bottlenose dolphin is a QI of Hook Head SAC (19.7 km). The species is recorded throughout the year in Irish waters, with group sizes typically of five to thirty animals, and a small semi-resident group occurs in Cork Harbour; most coastal sightings fall within 10 km of shore, and one highly mobile population ranges around the Irish coast (Annex IV Report). Calving peaks in July and August. Bottlenose dolphins are in the high-frequency cetacean hearing group, with a higher injury threshold than the porpoise group, and are therefore less susceptible to the audible sources than harbour porpoise. For the reasons in Section 6.3.1, the proposed usage cannot affect access to suitable habitat, critical habitat use or disturbance within Hook Head SAC. Dolphins approaching the vessel and encountering the USBL at close range would be protected by the same mitigation.

5.3.3 Grey seal (Halichoerus grypus) [1364]

Grey seal is a QI of Roaringwater Bay and Islands SAC (18.2 km) and Saltee Islands SAC

(37.7 km). The species is present year-round on the south coast; breeding occurs on exposed rocky shores and in sea caves between August and December, with the annual moult from November to April (Annex IV Report). Most foraging trips are within about 100 km of a haul-out site (Carter et al., 2022), so seals from these SACs could be present at the survey sites. The survey sites are 2 to 25 nautical miles offshore and no survey activity takes place at, or in the approaches to, any breeding, moulting or resting site. The CO attributes relating to breeding, moulting and resting behaviour and to population composition therefore cannot be affected. Seals are in the phocid hearing group with an injury criterion about 28 dB higher than harbour porpoise, and the predicted disturbance ranges are far smaller than the distances to the SACs. The assessment of access to suitable habitat and disturbance is the same as for harbour porpoise (Section 6.3.1).

5.3.4 Harbour seal (Phoca vitulina) [1365]

Harbour seal is a QI of Slaney River Valley SAC (48.1 km from the MUL area, the nearest site being Daru). Harbour seals are much less frequently recorded on the south coast than grey seals and typically forage within about 50 km of a haul-out (Annex IV Report; Carter et al., 2022), so some connectivity cannot be excluded. The conclusion is the same as for grey seal: no activity at haul-outs, small and temporary affected areas, and no overlap with the SAC.

Summary for marine mammals. The possibility of exposure of individual marine mammals associated with the screened-in SACs to temporary, low-level disturbance at the survey locations cannot be ruled out on a strictly precautionary basis, and mitigation is therefore proposed. With that mitigation, as detailed in Sections 8 and 11, there is no potential for adverse effects on the attributes or targets of the conservation objectives for any marine mammal QI.

5.4 Seabirds

5.4.1 Underwater noise and diving birds

The impacts of underwater noise on diving seabirds are poorly understood and the evidence of harm is limited (Hartley Anderson Limited, 2020; Harding and Cousins, 2022). Documented mortality of diving birds is associated with underwater explosions and affects only birds within tens of metres of the charge (Yelverton et al., 1973; Stemp, 1985; Danil and St Leger, 2011). Recent work on the great cormorant and on auks indicates that underwater hearing in diving birds is at least comparable to aerial hearing and is concentrated at frequencies considerably lower than those used here (Larsen et al., 2020; Smith et al., 2024). Oceyon's survey uses no explosive or impulsive high-energy source.

The ROV and AUV sonar and DVL sources (400–1,200 kHz) lie far above any frequency at which diving birds are known to hear. The USBL (24–32 kHz) also lies well above the low-frequency range in which diving bird hearing is concentrated. The audible component of the survey that is most likely to overlap with bird hearing is therefore vessel noise, which is comparable to that of the existing vessel traffic in the area. Any seabirds present within a few hundred metres are likely to be displaced by the presence of the vessel itself before any acoustic equipment is activated, which limits their exposure (Hartley Anderson Limited, 2020). Seabird responses to vessels are variable (Fliessbach et al., 2019) but any displacement would be temporary.

5.4.2 Seas off Wexford SPA [004237] – Daru wreck

The Daru wreck (113 m × 15 m, depth 88.7 m, about 20 nautical miles offshore) lies at the very edge of Seas off Wexford SPA, a marine SPA of 305,406 ha designated for 20

SCIs. The Determination Report screened in the diving species shag, cormorant, red-throated diver, guillemot, Manx shearwater, gannet and razorbill. The conservation objectives (NPWS, 2024) are to maintain the favourable conservation condition of red-throated diver, Manx shearwater, gannet, guillemot and razorbill, and to restore it for cormorant and shag. The attributes and targets for these SCIs are: population size (stable or increasing long-term SPA population trend); spatial distribution (sufficient locations, area and availability of suitable habitat); forage spatial distribution, extent and abundance; disturbance across the site (intensity, frequency, timing and duration of disturbance at levels that do not significantly impact the targets for population size and spatial distribution); and barriers to connectivity.

The survey at Daru will last for one day and not more than two days, in a single campaign, with one vessel and one ROV. The area potentially affected at any one time (a circle of 500 m radius, 78.5 ha) is 0.026% of the SPA; adopting the bounding radius of 1.5 km (707 ha) it is 0.23%. The attributes are assessed as follows:

- **Population size and spatial distribution:** a transient, localised displacement of birds within a few hundred metres of the vessel for no more than two days, in a very large SPA, cannot change the population trend or the number, area or availability of suitable habitat. The depth at Daru (88.7 m) is well outside the range preferred by red-throated diver, which concentrates in waters of 5–20 m (NPWS, 2024, citing Jessopp et al., 2018), and cormorant and shag are predominantly shallow-water foragers, so use of the Daru location by these species is expected to be low. Guillemot, razorbill, gannet and Manx shearwater are wide-ranging and exploit very large areas of the Irish Sea and Celtic Sea.
- **Forage spatial distribution, extent and abundance:** the survey does not disturb the seabed, produces no discharges and has no effect on prey. There is no pathway to forage resource.
- **Disturbance across the site:** disturbance would be limited to the vessel's presence and any response to vessel noise, of low intensity, for no more than two days in one location, and comparable to the baseline of commercial shipping, ferry and fishing traffic. This is not at a level that could significantly affect the targets for population size or spatial distribution.
- **Barriers to connectivity:** no fixed structure is introduced and the vessel is mobile; no barrier to access to the SPA or to other important sites can result.

Taking account of the precautionary principle and the screening conclusion, mitigation to avoid disturbance of aggregations of diving birds at Daru is nevertheless proposed (Section 8).

5.4.3 Other SPAs

The remaining screened-in SPAs lie between 6.75 km and 93.7 km from the MUL area and no survey activity takes place within them. The relevant SCIs (cormorant at Cork Harbour SPA; guillemot at Old Head of Kinsale SPA; gannet and razorbill at Saltee Islands SPA; gannet at The Bull and The Cow Rocks SPA; Manx shearwater at Deenish Island and Scariff Island SPA and at Puffin Island SPA) may forage at sea at or beyond the survey locations, with typical breeding-season foraging ranges for gannet and Manx shearwater of hundreds of kilometres, and for guillemot and razorbill of several tens of kilometres (Woodward et al., 2019). Any exposure of an individual bird from these colonies would be incidental, transient and in a small fraction of its foraging area, and would not affect the colony population, the distribution of the SCI or its prey. The vessel will pass through the Cork Harbour area on departure from and return to port, within the existing navigation

channels and amongst heavy commercial and recreational traffic; the vessel is small, slow-moving and in daylight and its contribution to disturbance of cormorants in Cork Harbour SPA is negligible.

Summary for seabirds. On a precautionary basis, the possibility of short-term disturbance of diving seabirds associated with the screened-in SPAs at the survey locations cannot be excluded. With the mitigation measures in Section 7 fully implemented, the predicted temporary disturbance would not undermine the conservation objectives of any screened-in SPA or adversely affect its integrity.

5.5 Other pathways

Vessel collision. The risk of collision with marine mammals depends on the speed of the vessel. Although the survey vessel is capable of 25 knots, it will transit between ports and sites in daylight under the control of an experienced skipper, will hold position or move at very low speed during survey, and will adopt the vessel speed measures in Section 8 when marine mammals are present. Collision risk is negligible.

Above-water noise, lighting and visual disturbance. The vessel is a single small craft operating in daylight only. Disturbance from vessel presence is comparable to existing traffic and was not identified in the Determination Report as likely to be significant. No night-time operations or artificial lighting at the surface are involved.

Accidental pollution. The vessel carries a small inventory of diesel fuel (consumption 120 litres per hour). It will return to port daily and be refuelled at existing shore facilities, not at sea. All vessel operations are subject to MARPOL and the Sea Pollution Act 1991. The risk of an accidental release of a quantity capable of affecting a European site is very low, and standard spill-prevention measures are included in Section 8.

Non-native species. The vessel is a small coastal craft operating from Irish ports. It does not exchange ballast water and does not transit from other jurisdictions. The risk of introducing non-native species is negligible. Standard hull-fouling management is included in Section 8.

Effects on prey. The only potentially audible sources are low in level and affect a small area for a short time, and prey species (fish) are not QIs or SCIs of any screened-in site. No effect on the availability of prey to the screened-in species is predicted.

6. In-combination effects

The Determination Report included an in-combination search, undertaken on 29/09/2026 using the MARA application and determinations database and foreshore licences, with a spatial scope defined by the extent of the MUL area and a temporal scope defined by the period of the proposed activities. Table 8 lists the projects identified in the Determination Report as having the potential to act in combination, together with an assessment of each. The Determination Report also considered the National Marine Planning Framework, the South Coast Designated Maritime Area Plan (SC-DMAP) and the Port of Cork Masterplan 2050.

Table 8. Projects considered for in-combination effects and assessment

Reference	Project (summarised from the Determination Report)	Distance from MUL area	Status	Assessment of potential to act in combination
MAC240057	900 MW offshore wind farm (Tonn Nua)	Overlap	Granted with conditions 26/03/2026	Construction noise sources would be subject to their own Appropriate Assessment and mitigation. Oceyon's effects are limited to a few hundred metres for no more than two days per site. No temporal overlap with construction is expected; coordination under measure M12 avoids simultaneous noise.
MUL250019	Site investigation works, Maritime Area A (Tonn Nua)	Overlap	Granted 20/05/2026	Survey noise sources with their own mitigation. Potential temporal coincidence is avoided under measure M12.
MUL240036 and MUL240036 MA	Site investigation for two offshore substations, cable corridors and landfalls (Tonn Nua)	Overlap	Granted 10/07/2025; amended 06/07/2026	As above.
MUL260021	Geophysical, geotechnical, metocean and biological surveys, South Coast DMAP	Overlap	Granted 28/07/2026	As above.
MUL230031	Geophysical survey and site investigation for a transatlantic subsea cable (landfall Castlefreke, Co. Cork)	Overlap	Granted 22/04/2025	Narrow corridor and survey noise sources with their own mitigation. Avoided by measure M12.
MAC250018	Subsea fibre optic cable system	1.8 km	Applied 11/12/2025	Installation not yet authorised; any noise-generating works would require their own AA. No interaction identified.
MAC20230016	Redevelopment of the Ballycotton gas reservoir (Kinsale Head)	Overlap	Applied 17/07/2024	Not yet authorised; subject to its own AA. No interaction identified.
FS007136, FS007436, FS007318	Foreshore licence applications for offshore wind farm site investigations (Helvick Head, Voyage Offshore Array, East Celtic)	Overlap; overlap; 9.8 km	Under consideration (received 2020–2022)	Applications not determined; if licensed, surveys would be subject to their own AA. Avoided by measure M12.
FS005115	Kinsale Head natural gas pipeline	1.5 km	Consented	Existing infrastructure; no active noise-generating works known.
N/A	Cork shipping lane (commercial traffic)	Overlap	Existing	Part of the baseline. Oceyon adds a single small vessel for a few days.

Assessment. The effects of the proposed usage on marine mammals and seabirds are confined to a few hundred metres around a single location at a time, last no more than two days per site, and occur in a single campaign. Other surveys and projects that could introduce underwater noise are either subject to their own Appropriate Assessment and mitigation, or have not been authorised, or form part of the existing baseline. The effect on any QI or SCI could become cumulative only if noise-producing activities were to occur simultaneously within the same area, so that sound from separate sources overlapped.

Measure M12 in Section 8 prevents that. Subject to that measure, there is no potential for the proposed usage to act in combination with other plans or projects to adversely affect the integrity of any European site. The plans considered (NMPF, SC-DMAP, Port of Cork Masterplan 2050) are plan-level frameworks that do not themselves authorise activities with noise pathways and do not interact with the proposed usage.

7. Mitigation measures

The measures below are proposed by Oceyon to avoid any adverse effect on the integrity of the screened-in sites. They follow the NPWS (2014) Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters and are adopted as commitments of the usage. They will be incorporated into the Project Environmental Management Plan and the vessel's survey procedures, and Oceyon will accept them as conditions of any licence.

Table 9. Mitigation measures

Ref.	Measure	Description
M1	Marine Mammal Observer (MMO)	At least one MMO with NPWS-recognised training will be on board and dedicated to observation during all periods when the USBL is to be or is operated. The MMO will have authority to delay or halt the use of the USBL.
M2	Monitored Zone	A 500 m Monitored Zone will be established around the vessel and the USBL transceiver, in accordance with the NPWS (2014) Guidance. This exceeds the largest predicted disturbance range for audible sources under the 15 log R model (54 m) and the spherical model, and encompasses the cylindrical bound (398 m).
M3	Pre-start watch	A continuous visual watch of the Monitored Zone of at least 30 minutes (60 minutes where the water depth exceeds 200 m) will be made before the USBL is first activated at each site. The USBL will not be activated if marine mammals are seen in the zone during that watch until the animals have left and 30 minutes have elapsed since the last sighting.
M4	Ramp-up	Where the USBL source level can be controlled, it will be ramped up over a period of at least 20 minutes, from the lowest practicable power to the operating level. The USBL will be operated at the lowest source level adequate for the positioning task.
M5	Break rule and delay	If the USBL stops for more than 30 minutes, the pre-start watch and ramp-up will be repeated. If marine mammals enter the Monitored Zone during operations, the MMO will advise the Survey Manager, who will reduce power or pause the USBL as practicable having regard to the safety of the ROV and vessel.
M6	Daylight and visibility	Pre-start watches and USBL operation will be undertaken in daylight and in conditions where the MMO can observe the Monitored Zone (good visibility, sea state at or below the level at which marine mammals can be reliably detected). Operations will not start in poor visibility.
M7	Vessel speed and collision avoidance	The vessel will keep a lookout for marine mammals and seabirds at all times. Speed will be reduced and course altered where animals are seen close to the vessel's track. Vessels will not deliberately approach marine mammals, and a speed of no more than 10 knots will be maintained when animals are within 500 m.
M8	Seabirds (Daru and open-water sites)	Before moving to or starting work at Daru (within Seas off Wexford SPA), the MMO or a trained observer will check for rafts or concentrations of diving seabirds (including divers, auks and shearwaters). The vessel will avoid approaching concentrations at speed and will, where practicable, position itself to avoid flushing them. Seabirds seen in the area will be recorded.

Ref.	Measure	Description
M9	Minimisation of acoustic output	Sonar, DVL and positioning equipment will be operated only when required for the survey task and switched off during transit. No explosive, air-gun, boomer, sparker or other impulsive source will be used. Source levels will be set to the minimum required.
M10	Pollution prevention	The vessel will be refuelled in port only. It will carry a Shipboard Oil Pollution Emergency Plan (SOPEP) and spill kit and comply with MARPOL and the Sea Pollution Act 1991. All spills or releases will be reported to MARA and the relevant authorities.
M11	Biosecurity	The vessel and ROV/AUV will be clean and free of fouling and will be rinsed with fresh water before deployment. The vessel will not exchange ballast water at sea. The ROV/AUV will not be moved between sites without being cleaned if used in other jurisdictions.
M12	Coordination with other operators	Oceyon will check the MARA register and notify MARA of the survey programme before mobilisation, and will not operate the USBL while another noise-generating survey is operating within 5 km of the same location. Any such activity identified will be reported to the MMO and the schedule adjusted.
M13	Records and reporting	The MMO will record all observations and all operations of the USBL on the NPWS (2014) Appendix 6 forms and the records will be sent to NPWS and MARA within the period required. Any incident, including any suspected injury or stranding, will be reported immediately.

The measures are straightforward to implement and are standard practice for marine surveys in Irish waters. They were designed to remove the possibility of any animal being exposed to sound within the range at which it could be injured or disturbed, and so to avoid any adverse effect on the conservation objectives of the sites in Section 11.

8. Transboundary effects

The nearest European site outside the State is in the United Kingdom, over 100 km from the closest survey location. The predicted effects of the proposed usage extend to at most a few hundred metres from the vessel. No transboundary effects on any European site are possible.

9. Residual effects

With the mitigation in Section 8 fully implemented, there is no residual effect from the proposed usage that could affect the attributes or targets of the conservation objectives of any of the 15 European sites screened in, alone or in combination with other plans or projects. The only residual effect is the possibility of a transient, low-level behavioural response by individual animals within a few tens to hundreds of metres of the vessel for no more than two days at each site. This is not a significant effect on any conservation objective.

10. Summary of assessment by site

Table 10. Assessment of effects on the integrity of screened-in European sites, with mitigation

European site	Distance from MUL area	Qualifying Interest / SCI	Potential effect considered	Conclusion with mitigation (M1–M13)
Roaringwater Bay and Islands SAC	18.2 km	Harbour porpoise; grey seal	Disturbance at foraging locations; no overlap with SAC, haul-outs or breeding sites	No adverse effect on integrity
Hook Head SAC	19.7 km	Harbour porpoise; common bottlenose dolphin	Disturbance at foraging locations; no overlap with SAC	No adverse effect on integrity
Saltee Islands SAC	37.7 km	Grey seal	As above	No adverse effect on integrity
Carnsore Point SAC	31.8 km	Harbour porpoise	As above	No adverse effect on integrity
Blackwater Bank SAC	36.2 km	Harbour porpoise	As above	No adverse effect on integrity
Kenmare River SAC	86.2 km	Harbour porpoise	As above	No adverse effect on integrity
Blasket Islands SAC	138.4 km	Harbour porpoise	As above	No adverse effect on integrity
Slaney River Valley SAC	48.1 km	Harbour seal	As above	No adverse effect on integrity
Seas off Wexford SPA (004237)	Daru at the very edge of the SPA	Shag, cormorant, red-throated diver, guillemot, Manx shearwater, gannet, razorbill	Temporary disturbance by vessel and vessel noise to diving birds; 0.026% of the SPA (0.23% bounding area)	No adverse effect on integrity
Cork Harbour SPA	6.75 km	Cormorant	Vessel transit; incidental foraging exposure	No adverse effect on integrity
Old Head of Kinsale SPA	27.0 km	Guillemot	Incidental exposure while foraging at sea	No adverse effect on integrity
Saltee Islands SPA	47.5 km	Gannet; razorbill	Incidental exposure while foraging at sea	No adverse effect on integrity
The Bull and The Cow Rocks SPA	68.9 km	Gannet	Incidental exposure while foraging at sea	No adverse effect on integrity
Deenish Island and Scariff Island SPA; Puffin Island SPA	76.6 km; 93.7 km	Manx shearwater	Incidental exposure while foraging at sea	No adverse effect on integrity

Distances are as given in the Determination Report; site codes in Tables 4 and 5.

11. Conclusion

This NIS has examined the potential effects of Oceyon's proposed non-invasive ROV/AUV survey of ten shipwrecks off the counties of Cork, Waterford and Wexford (MUL260003) on the 15 European sites identified in the Determination Report, in view of their conservation objectives, using the best available scientific information and the equipment, locations and programme described in the application.

The sonar and Doppler sensors on the ROV and AUV operate at 400 kHz or more, above the hearing range of every marine mammal group, and have no effect on marine

mammals. The audible sources, the USBL and the vessel, produce disturbance ranges of at most about 54 m (up to about 400 m under the most conservative bound), well within the 500 m Monitored Zone, and are far smaller than the distance from any survey site to any SAC designated for marine mammals (at least 18.2 km). At Daru, in Seas off Wexford SPA, the area potentially affected is at most 0.23% of the SPA for no more than two days.

Provided that the mitigation measures in Section 7 are implemented in full, it is concluded on the basis of objective scientific information that the proposed usage, alone or in combination with other plans or projects, **will not adversely affect the integrity of any European site**, and there is no reasonable scientific doubt as to that conclusion.

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