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IRISH NATIONAL HERITAGE PARK

ENVIRONMENTAL SURVEYS AND GROUND INVESTIGATION WORKS

Risk Assessment for Annex IV Species

February 2026

Client
Wexford County Council
County Hall,
Carricklawn,
Wexford,
Y35 WY93.

Irish National Heritage Park

Environmental Surveys and Ground Investigation Works

Risk Assessment for Annex IV Species

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1.0 INTRODUCTION

1.1 Overview

Roughan & O'Donovan (ROD) was appointed by Wexford County Council (WCC) to undertake, on its behalf, a risk assessment for Annex IV species to support a Marine Usage Licence application to the Maritime Area Regulatory Authority (MARA), for maritime usage. The licence application is in respect of marine environmental surveys and ground investigation works ("the proposed works") for the purposes of site investigation to inform the design of the Irish National Heritage Park at Ferrycarrig, Co. Wexford.

1.2 Legislative Context

1.2.1 Maritime Area Planning legislation

In December 2021, the Government passed the Maritime Area Planning (MAP) Act, 2021 to regulate the maritime area. The MAP Act will achieve this through the National Marine Planning Framework, maritime area consents for the occupation of the maritime area for the purposes of maritime usages for undefined or long periods of time, and licences for marine usages for a relatively short periods of time. The Maritime Area Regulatory Authority (MARA) has been established to oversee the enforcement of this Act. As part of this role, MARA will review applications for consents and licences within the maritime area.

The proposed works are located in a maritime area and are required to inform the design of the Irish National Heritage Park. These works fall under Schedule 7(3) of the MAP Act, 2021 relating to the 'Maritime Usages which may be undertaken in Maritime Area pursuant to Licence':

> "*3. Marine environmental surveys for the purposes of site investigation or in support of an application under Part XXI of the Act of 2000*".

In accordance with the Act, the proposed works are required to hold a valid licence prior to their commencement.

This report has been prepared to inform the licence application for the proposed works in accordance with the MARA Applicant Technical Guidance Note (2023), for the requirement to complete an Annex IV Risk Assessment.

1.2.2 Annex IV Species Legislation

The Habitats Directive (92/43EEC) is the principal instrument of EU legislation for the protection of natural habitats and wild species. Article 12 of the Directive requires all Member States to "*establish a system of strict protection for the animal species listed in Annex IV (a) in their natural range*". This requirement is transposed into Irish law by Section 51 of the European Communities (Birds and Natural Habitats) Regulations, 2011 (S.I. No. 477/2011, as amended) ("the Habitats Regulations").

Section 51 of the Habitats Regulations protects Annex IV fauna from deliberate capture, killing, disturbance (particularly during sensitive periods), taking or destruction of eggs, damage or destruction of breeding and resting places, and trade or trafficking by making all such activities an offence (save where done in accordance with a licence granted under Section 54 of the Regulations). This applies to all the life stages of the species concerned.

The Annex IV fauna which are relevant in an Irish context include the following:

- 'Microchiroptera – All species' (all bat species present in Ireland);
- Otter (*Lutra lutra*);
- 'Cetacea – All species' (all whales, dolphins and porpoises);
- A number of sea turtles, including the regularly occurring Leatherback Turtle (*Dermochelys coriacea*) and the less frequent Loggerhead Turtle (*Caretta caretta*);
- Natterjack Toad (*Epidalea calamita*);
- Kerry Slug (*Geomalacus maculosus*).

In addition, the relevant Minister is required to monitor the incidental capture and killing of Annex IV fauna and ensure that any incidental capture and killing does not have a significant negative impact on the species concerned.

This Annex IV Species Risk Assessment has been prepared to support the MARA licence application ("the Application") for the proposed works in accordance with the MARA Applicant Technical Guidance Note (2023)[1].

1.3 Methodology

This assessment has been carried out with regard to the relevant legislation and guidance, as well as the documentation submitted with the Application and other information which is publicly available. The documents and sources of information which informed this assessment are as follows:

- Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (the Habitats Directive). Official Journal of the European Communities, *L206/7*.
- Council Decision 98/249/EC of 7 October 1997 on the conclusion of the Convention for the protection of the marine environment of the north-east Atlantic. Official Journal of the European Communities, *L104/1*.
- Council Directive 2008/56/EC of 17 June 2008 establishing a framework for community action in the field of marine environmental policy (Marine Strategy Framework Directive). Official Journal of the European Communities, *L164/19*.
- DAHG (2014) *Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters.* Department of Arts, Heritage and the Gaeltacht, Dublin.
- DEHLG (2007) *Code of Practice for the Protection of Marine Mammals during Acoustic Seafloor Surveys in Irish Waters.* Department of the Environment, Heritage and Local Government, Dublin.
- DHLGH (2021) *Marine Strategy Framework Directive 2008/56/EC: Article 17 update to Ireland's Marine Strategy Part 2: Monitoring Programme (Article 11).* Department of Housing, Local Government and Heritage.
- EC (2021) *Guidance document on the strict protection of animal species of Community interest under the Habitats Directive 92/43/EEC*. European Commission, Brussels.
- European Communities (Birds and Natural Habitats) Regulations, 2011. SI No. 477/2011 (as amended).

[1] Obtaining a Licence to Carry Out Specified Maritime Usages in the Maritime Area under the Maritime Area Planning Act 2021 – Applicant Technical Guidance Note (2023)

- IWDG (2025) *Sightings Map* <https://iwdg.ie/browsers/sightings-map.php?foundrecords=2434> [accessed December 2025]. Irish Whale and Dolphin Group, Kilrush.
- MARA (2025) *Guidance Note for Applicants applying for a Maritime Usage Licence (MUL)*. Version 7.
- Marine Institute (2025) *Ireland's Marine Atlas* <https://atlas.marine.ie/> [accessed December 2025]. Marine Institute, Oranmore.
- NPWS (2007) Circular Letter NPWS 2/07. Guidance on Compliance with Regulation 23 of the Habitats Regulations 1997 – strict protection of certain species/ applications for derogation licences. National Parks & Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin
- NPWS (2021) *Guidance on the Strict Protection of Certain Animal and Plant Species under the Habitats Directive in Ireland.* National Parks and Wildlife Service, Department of Housing, Local Government and Heritage, Dublin.
- NPWS (2025) *Applications for Regulation 54 Derogations for Annex IV species: Guidance for Applicants.* National Parks and Wildlife Service, Department of Housing, Local Government and Heritage, Dublin.
- NBDC (2026) *Biodiversity Maps* <https://maps.biodiversityireland.ie/Map> [accessed February 2026]. National Biodiversity Data Centre, Waterford.

1.4 Statement of Authority

This report has been prepared by Rachel Heaphy and reviewed by Patrick O'Shea. Rachel is an Ecologist with more than 4 years' experience in ecological assessment. She holds a BSc in Zoology from University College Cork and an MRes from the University of Roehampton. She is a Qualifying member of the Chartered Institute of Ecological and Environmental Management. Patrick is a Principal Ecologist over 13 years' experience in ecological consultancy. He holds a bachelor's degree (with honours) in Botany from Trinity College Dublin, and an MSc in Ecological Management and Conservation Biology from Queen's University Belfast. He is a full member of the Chartered Institute of Ecology and Environmental Management (MCIEEM).

2.0 DESCRIPTION OF THE PROPOSED WORKS

2.1 Background

Wexford County Council, in conjunction with Fáilte Ireland, is committed to developing Wexford as a tourism destination. The design of the proposed Irish National Heritage Park at Ferrycarrig, Co. Wexford aims to create, develop and incorporate a new experience '*Vikingar – Beyond Legend'* into its overall visitor experience.

The proposed works are required to inform the design of the proposed Irish National Heritage Project, whereby 3 No. jetties and a man-made beach area are proposed to be installed on the southern bank of the Lower Slaney Estuary, to the north of the existing Irish National Heritage Park.

2.2 Location

The Irish National Heritage Park is located in Ferrycarrig, on the R730, northwest of Wexford town. The proposed works will be undertaken within the Lower Slaney Estuary.

No alternatives have been considered for the proposed works. The locations have been selected based on a preliminary review of the site location, although the exact locations may vary slightly based on the conditions of the riverbed during the time of installation.

2.3 Environmental Surveys

Acoustic Doppler Current Profiler (ACDP) Hydro Acoustic Survey

It is proposed to install two Acoustic Doppler Current Profiler (ADCP) Flow Meters into the Lower Slaney River Channel north of the existing Irish National Heritage Park, to measure tidal flow, speed and direction within the channel.

An ADCP is a hydroacoustic current meter similar to a sonar, used to measure water current velocities over a depth range using the Doppler effect of sound waves scattered back from particles within the water column.

The ADCPs will either be:

a) deployed in frames or bottom mounts on the riverbed, or

b) attached to a floating buoy if site conditions are not suitable for bottom mounts at installation.

Bottom mounted ADCPs will have a footprint of approx. 1.5m^2 each.

An unmanned surface vessel may also be deployed over a period of 24 hours. This process may be repeated in different parts of the tidal cycle to supplement the data collection, pending any issues with the data or if the results come back as incomplete.

The ADCPs will be deployed for a full tidal cycle (approx. 29 days) to measure water flow within the river. A substantial vessel with a winch will be required to deploy the ADCPs. The frames / bottom mounts will be selected or developed to suit the riverbed environment upon inspection, prior to the surveys being undertaken. The frames / bottom mounts will sit on the riverbed and may be held there by lead weights or other heavy weights which will be attached to the frames to keep them in place.

Each of the ADCPs may be marked with a buoy and precautions will be made to avoid damage or loss of equipment. As they will be located in shallow water, the noise emitted will likely be within the range of 600kHz – 1 MHz. The results will be saved to internal memory or output online to an external display software.

The ADCPs will be installed at the approximate locations of the blue triangles in Figure **2.1** below. The locations for the ADCPs are situated in the River Slaney, upstream of the N11 Bridge and Ferrycarrig to monitor water flow in the area. The locations of the ADCPs may move slightly on the advice from the supplier at the time of installation, depending on the conditions of the riverbed.

Sediment Samples

Sediments samples will be obtained at five locations within the River Slaney, as presented in Figure 2.1. These samples will be obtained using a Van Veen grab (or similar method) from a small vessel. Two surface samples of approximately 5 litres (about 15 cm penetration) in suitable sediment will be extracted at each of the five locations (total volume of 50L) and removed to a laboratory for testing. One sample from each location will undergo gradient analysis to determine the particle sizes present. The second sample will be tested to determine benthic sediment quality.

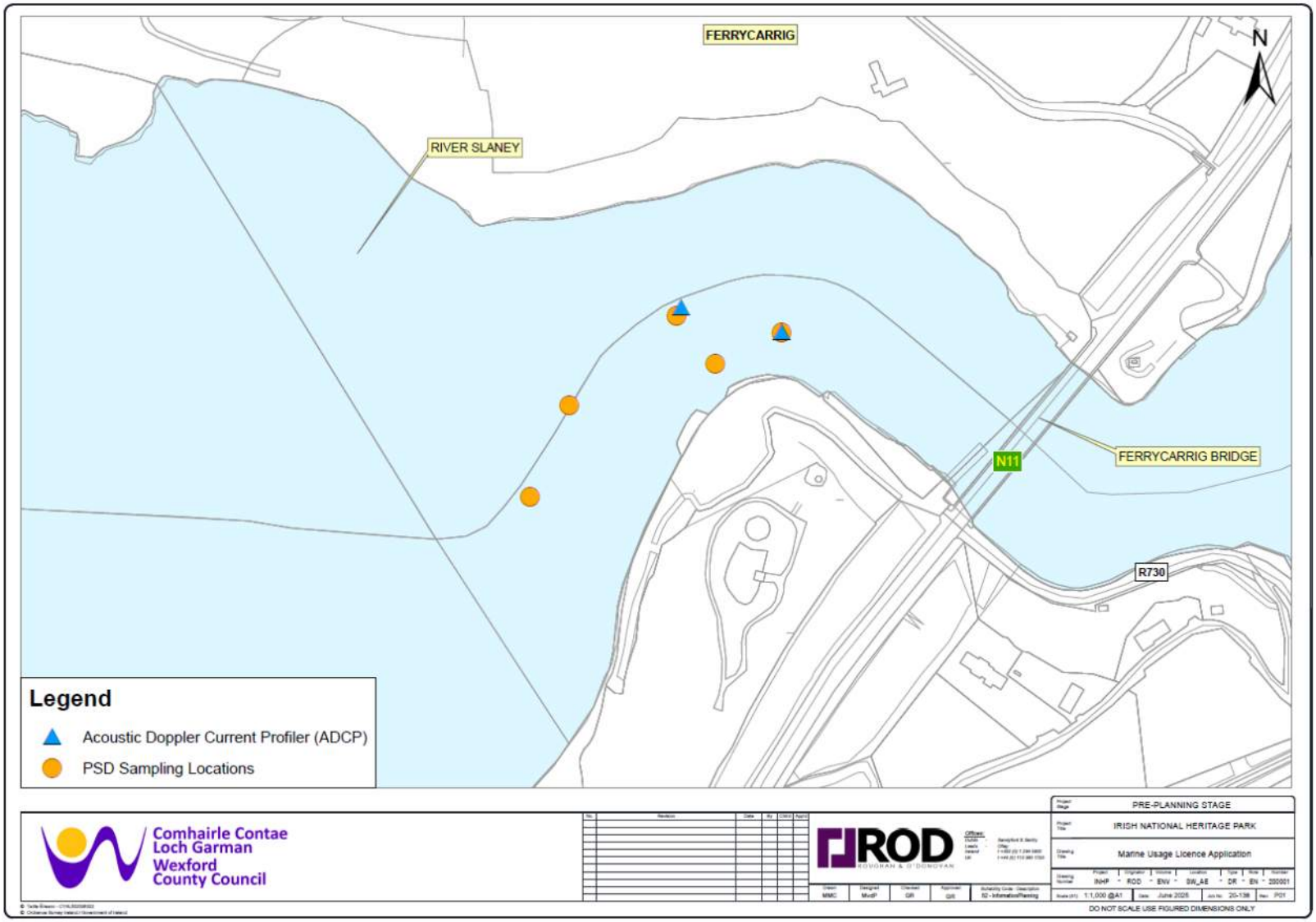

Figure 2.1 Proposed location of ADCPs and PSD samples in the Slaney Estuary.

2.4 Ground Investigations (The GI works)

2.4.1 Overview

The GI works will include five combined Cable Percussion (CP) and Rotary Core (RC) Boreholes (BH) in the river, one combined Cable Percussion and Rotary Core Borehole on land, grab sampling at five locations and geophysical surveys comprising Multi-Beam Echo Sounder, Side Scan Sonar and Sub-Bottom Profiling, as presented in Table 2.1, Table **2.2** and Table 2.3. A piezometer will be installed as part of the land-based CP & RC to monitor groundwater levels.

2.4.2 Location

The proposed GI works will be undertaken within the tidal reach of the River Slaney and in close proximity to the river wall along the edge of the old R730. The 5 no. in-river boreholes will be carried out from a barge. Some land-based investigation works will also be required, located along the alignment of the old R730 within 10m of the existing masonry river wall. The exact locations of the proposed GI works have yet to be determined.

2.4.1 Timing and Duration

The programming of the GI works has not yet been determined although they are anticipated to be completed within three months of their commencement.

2.4.2 Outline of the GI works

The scope of the GI works envisaged under this ground investigation is as follows:

a) Geophysical surveys comprising High Multi-Beam Echo Sounder survey, Side Scan Survey and Sub-Bottom Profiling techniques;

b) Shell and auger or cable percussion boreholes, sampling and *in situ* testing;

c) Vertical open hole rotary drilling, sampling and *in situ* testing;

d) Rock coring, proving rock to a specified depth and *in situ* testing;

e) Monitoring of groundwater levels in standpipes and piezometers;

f) Detailed borehole and coring;

g) Sampling to IS EN 22475-1 requirements, predominantly providing Category A samples for laboratory testing of strength and stiffness;

h) Logs as described in IS EN14688-1; IS EN1489-1; and BS5930 and the specification;

i) The ground investigation should be carried out in accordance with British Standard 10175:2001+A2:2017, Investigation of Potentially Contaminated Sites: Code of Practice and the EPA Landfill Manual: Investigations for landfill.

j) Specific sediment grab samples to be carried out for the purpose of grading analysis, contamination assessment, waste classification and offshore marine disposal of excavated spoil plus laboratory testing of soil and groundwater samples for engineering properties, behaviour and suitability for reuse as engineering fill;

k) Laboratory testing of soil and rock samples for engineering properties, behaviour and suitability;

l) Laboratory testing of soil and groundwater samples for environmental contamination, waste classification and offshore marine disposal of excavated spoil;

m) Preparation of detailed Main Factual Report as per S1.21.8 and cl 16.8 of the Specification, together with the production of Digital Data to AGS Format as per S1.21.10 and cl. 16.5;

n) Preparation of an interpretive Ground Investigation Report in accordance with IS EN1997-2, Section 6 as per S1.21.9;

o) Preparation of a Contamination Assessment Report in accordance with the EPA document '*Environmental Risk Assessment for Unregulated Waste Disposal Sites (2007)*' as per Cl 1.21.9.

p) Preparation of a Waste Classification Assessment and reporting of acceptability of materials for disposal as inert, non-hazardous or hazardous wastes to landfill facilities in accordance with the Commission Decision of 18 December 2014 and EU Commission Regulation No 1357/2014;

q) Assessment of river bottom sediment samples for potential offshore marine disposal in compliance with Marine Institute (2006) "*Guidelines for Assessment of Dredge Material for Disposal in Irish Waters*".

r) Liaison with the Wexford Harbourmaster and Waterways Ireland in respect of access, safety measures and employee training required for exploratory works within or in the vicinity of navigable waterways; and

s) Liaison and compliance with Health & Safety requirements of PSCS and general contractor.

The schedule of investigations is presented in Table 2.1, Table 2.2 and Table 2.3 below.

2.4.3 Schedule of Investigations

Table 2.1 Borehole Schedule

Cable Percussion Borehole & Rotary Core Locations								
Hole ID.	Type	Scheduled Depth (m BGL)				Remarks	Coordinates (ITM Grid)	
		CP	RO	PG	RC		Easting	Northing
Marine BHs								
BH/RC101	CP & RC	15	-	-	20 to 30 (5m into rock)	RC may continue beyond its scheduled depth up to the level where rock is found. SPTs as per specification. Environmental samples.	TBC	TBC
BH/RC102	CP & RC	15	-	-	20 to 30 (5m into rock)	RC may continue beyond its scheduled depth up to the level where rock is found. SPTs as per specification. Environmental samples.	TBC	TBC
BH/RC103	CP & RC	15	-	-	20 to 30 (5m into rock)	RC may continue beyond its scheduled depth up to the level where rock is found. SPTs as per specification. Environmental samples.	TBC	TBC
BH/RC104	CP & RC	15	-	-	20 to 30 (5m into rock)	RC may continue beyond its scheduled depth up to the level where rock is found. SPTs as per specification. Environmental samples.	TBC	TBC
BH/RC105	CP & RC	15	-	-	20 to 30 (5m into rock)	RC may continue beyond its scheduled depth up to the level where rock is found. SPTs as per specification. Environmental samples.	TBC	TBC
Land BHs								
BH/RC106	CP & RC	15	-	-	20 to 30 (5m into rock)	RC may continue beyond its scheduled depth up to the level where rock is found. SPTs as per specification. Piezometer to be installed. Contamination Samples.	TBC	TBC
Notes	Each borehole may take approximately 3 no. days to complete. In-river borehole drilling will be undertaken from a low draft/flat-bottomed jack up barge.							

Table 2.2 Grab Sample Schedule for Contamination Assessment

Contamination Assessment Grab Sample Locations					
Hole ID.	Type	Scheduled Depth (m BGL)	Remarks	Coordinates (ITM Grid)	
				Easting	Northing
GS101	GS	0.5	Sediment samples to be taken from the riverbed soils at shallow depths and locations as per specification	TBC	TBC
GS102	GS	0.5	Sediment samples to be taken from the riverbed soils at shallow depths and locations as per specification	TBC	TBC
GS103	GS	0.5	Sediment samples to be taken from the riverbed soils at shallow depths and locations as per specification	TBC	TBC
GS104	GS	0.5	Sediment samples to be taken from the riverbed soils at shallow depths and locations as per specification	TBC	TBC
GS105	GS	0.5	Sediment samples to be taken from the riverbed soils at shallow depths and locations as per specification	TBC	TBC

Table 2.3 Geophysical Surveys

Geophysical Survey Locations			
Method	**Remarks**	**Coordinates (ITM Grid)**	
		Easting	**Northing**
Multi-Beam Echo Sounder (MBES)	*To provide continuous water depth profile and bathymetric chart*	-	-
Side Scan Sonar (SSS)	*To map riverbed conditions and sediments and detect potential obstructions, debris, existing infrastructure, etc.*	-	-
Sub-Bottom Profiling (SBP)	*Investigate shallow geology and sub-bottom stratigraphy*	-	-

Notes

1. CP = Cable Percussion, GS = Grab Sediment Sample; MBES = Multi-Beam Echo Sounder; RO = Rotary Open Hole, RC = Rotary Core, PG = Polymer Gel Geobor-S Rotary Coring, SBP = Sub-Bottom Profiling; SSS = Side Scan Sonar.
2. Coordinates to Irish Transverse Mercator Grid (ITM) and reduced levels to Malin Head Datum required for all BH i.e. CP and RC.
3. Undisturbed sampling is required in cohesive soils.
4. A minimum total core recovery of 95% and a minimum rock quality designation of 40% is required when coring in rock. Where voids are encountered a standard penetration test shall be undertaken.
5. Standard penetration tests are to be carried out as per the Specification.

3.0 ANNEX IV RISK ASSESSMENT

3.1 Zone of Influence

The “Zone of Influence” of a project is the geographic extent over which significant ecological effects are likely to occur. Best practice guidance recognises that the Zone of Influence on a case-by-case basis using the Source-Pathway-Receptor Model. A project may only lead to significant effects on the integrity of the European site where all three elements of Source-Pathway-Receptor are linked. In the absence of one element of this model, significant effects can be ruled out with confidence. The assessment should make reference to the following key variables:

- The nature, size and location of the project;
- The nature of the impacts which may arise from the project;
- The sensitivities of the ecological receptors; and,
- The potential for in-combination effects.

In the marine environment, a Zone of Influence can be extensive e.g. pollution and materials can easily be transported elsewhere, currents and waves can be altered causing effects well beyond the site and effects on mobile species may be manifest elsewhere (CIEEM, 2024).

In order to assess the potential impacts on Annex IV species and considering the nature and scale of the proposed works, the zone of influence is defined as:

- The entire area within 500m of the proposed works for noise and visual disturbance associated with the proposed works.
- The Lower Slaney Estuary Transitional Waterbody.

The area within 500m of the proposed works is a precautionary distance at which impacts from airborne noise and visual disturbance could occur. The Lower Slaney Estuary Transitional Waterbody is the extent to which hydrological impacts, including impacts associated with underwater noise, could potentially occur upstream and downstream of the proposed works in the Lower Slaney Estuary.

A search for records of Annex IV species within the Zone of Influence was undertaken as part of the assessment.

The Zone of Influence is presented in Figure 3.1 below.

Figure 3.1 Zone of Influence of the environmental surveys of the Irish National Heritage Park.

3.2 Annex IV Species

Table 3.1 presents the Annex IV fauna that have been recorded in the vicinity of the proposed works. This includes data from the Irish Whale and Dolphin Group's *Sightings Map* (IWDG, 2025), National Biodiversity Data Centre's *Biodiversity Maps* (NBDC, 2025), *Ireland's Marine Atlas* (Marine Institute, 2025) and records collected on ecological surveys are the site of the proposed works to date.

Table 3.1 Annex IV fauna recorded within the zone of influence.

Common Name	Scientific Name
Cetaceans	
Bottle-nosed Dolphin	*Tursiops truncatus*
Common Dolphin	*Delphinus delphis*
Harbour Porpoise	*Phocoena phocoena*
Minke Whale	*Balaenoptera acutorostrata*
Terrestrial mammals	
Otter	*Lutra lutra*
Common Pipistrelle	*Pipistrellus pipistrellus*
Soprano Pipistrelle	*Pipistrellus pygmaeus*
Leisler's Bat	*Nyctalus leisleri*

Other Annex IV fauna, such as those listed in Section 1.2 are considered either not to occur within the zone of influence or occur only very infrequently or in exceptional cases. The assessment in the following subsections focusses on the species listed in Table 3.1.

3.3 Assessment of Impacts

This section provides an assessment of the impacts arising from the proposed works on the Annex IV fauna listed in Table 3.1.

3.3.1 Cetaceans

Four cetacean species; Bottle-nosed Dolphin (*Turisops truncatus*), Common Dolphin (*Delphinus delphis*), Harbour Porpoise (*Phocoena Phocoena)* and Minke Whale (*Balaenoptera acutorostrata*) have been recorded within the Zone of Influence (NBDC, 2025; IWDG, 2025). Records of these species are infrequent, and the risk of these species and other cetaceans occurring in the vicinity of the proposed works is very low, but it is considered possible that they could occur in the vicinity of the proposed works.

Wexford harbour is a fishing port and is also used by pleasure craft, with constant boat traffic moving around the harbour. Considering this, as well as the tidal nature of Wexford Harbour and the Slaney Estuary, there is constant mobilisation of sediment in the harbour occurring as part of the natural process. Any potential mobilisation of sediment a result of the proposed works will be immeasurable.

Additionally, given the constant movement of marine vessels in the harbour and the widespread availability of more suitable habitat elsewhere in Wexford Harbour and further afield, it is highly unlikely that cetaceans would occur in the vicinity of the

proposed works. The vessel undertaking the surveys will be slow moving and there is no risk of collision with cetaceans.

The risk of injury or mortality as a result of a vessel collision is considered extremely low as the vessels will be moving at low speeds and cetaceans infrequently occur within Wexford Harbour and the Slaney Estuary.

Marine mammals are vulnerable to anthropogenic noise inputs into the aquatic environment. Underwater noise has the potential to cause a range of impacts to marine life including to injury (hearing damage) and behavioural changes. Hearing damage injury is known as threshold shift can be either permanent (Permanent Threshold Shift, (PTS)) or temporary (Temporary Threshold Shift, (TTS)).

Behavioural changes can include communication disruption, altered foraging behaviour or displacement from the area. Noise from anthropogenic sources have been measured to assess the levels which could cause injury to cetaceans. These are used as thresholds and are commonly used to assess the level of risk associated with noise producing activities in the marine environment. The lowest threshold for TTS in cetaceans is 183 dB SEL (Southall et al. 2007). These are presented below in Table 3.2.

Table 3.2 Marine mammal noise exposure criteria given by Southall et al. 2007.

Species	Hearing group and estimated auditory bandwidth (kHz)	Exposure Criteria at Receptor (SPL – sound pressure level[2], SEL – sound exposure level[3])		
		PTS – onset *	TTS-onset	Behavioural response
Certain toothed whales, porpoises Pygmy sperm whale Harbour porpoise	High-frequency cetaceans 0.2 - 180 kHz	230 dB SPL 198 dB SEL	224 dB SPL 183 dB SEL	90-170 dB RL [4]
Most toothed whales, dolphins Sperm whale Killer whale Long-finned pilot whale Beaked whale species Dolphin species	Mid-frequency cetaceans 0.15 - 160 kHz	230 dB SPL 198 dB SEL	224 dB SPL 183 dB SEL	90-200 dB RL
Baleen whales Humpback whale Blue whale Fin whale Sei whale Minke whale	Low-frequency cetaceans 0.007 - 22 kHz	230 dB SPL 198 dB SEL	224 dB SPL 183 dB SEL	120-160 dB RL

[2] Sound Pressure Level (SPL) – A logarithmic measure in decibels (dB) of the average pressure level in water/air, with respect to a standard reference pressure (i.e., re. 1µPa in water or 20µPa in air). Commonly standardised to a distance of 1 metre from the source (i.e., @ 1m), SPL represents the amplitude of a sound's waveform and it may be measured in a number of ways including peak or peak-to-peak (for short duration sounds) and root mean square (i.e., rms) estimates (for continuous sounds).
[3] Sound Exposure Level (SEL) – A measure of sound energy over a given duration, i.e., time integral of instantaneous sound pressure squared, normalised to a 1 second period (dB re. µPa2–s or µPa2.s).
[4] Sound Received Level (RL) – the pressure level measured at the receiver, e.g., mammal.

Table 3.3 Underwater noise levels emitted by the environmental survey and GI equipment.

Sound Type	SIL (dB ref µPa at 1 m)	Frequency (kHz)	Within cetacean frequency hearing ranges
Environmental Surveys			
Acoustic Doppler Current Profiler (ADCP) (Model: Signature1000)	217	600-1000	No
Vessel (Sediment Sampling)	180	<1	Yes
GI Works			
Cable Percussion (CP)	220	<0.5	Yes
Rotary Core (RC)	170	0.5-5	Yes
Multi-Beam Echo Sounder (MBES)	210-245	200 - 500	No
Side Scan Sonar (SSS)	200 - 240	200 - 700	No
Sub-Bottom Profiling (SBP)	185 - 215	2 – 15	Yes
Vessel	180	<1	Yes

The ambient underwater noise levels in Wexford Harbour is not known but is expected to be dominated by environmental noise (e.g. tidal movement of water and sediment) and shipping traffic. Downstream of the proposed development in Wexford Harbour, noise due to recreational and fishing vessels transiting between Wexford town and the Irish Sea adds to the baseline underwater noise levels. Mussel fishing vessels are particularly common in Wexford Harbour with a large area of the harbour licenced under active Aquaculture licences.

Based on the sound frequencies that will be emitted during the proposed works, as listed in Table 3.3, and the hearing ranges of the marine mammals as listed in Table 3.2, there is a potential impact to marine mammals as a result of the proposed works.

The fact that certain activities will generate noise within the hearing range of cetaceans does not infer that there will be negative impact. For an impact to occur, the noise must be within the hearing range (i.e. the frequency) and at a level (Db) that exceeds the threshold for various responses at the receptor. The noise levels from the proposed works are given at a distance of 1m from the source of the noise. The actual noise level at the receptor is likely to be much lower as the noise attenuates.

Given to the nature and location of the proposed works, there is a risk of impacts to the cetacean species which occur in the zone of influence of the works. In the absence of mitigation, impacts to cetaceans afforded strict protection under Article 12 of the Habitats Directive as a result of the proposed works would constitute offences under Section 51 of the Habitats Regulations. Therefore, mitigation measures are proposed in Section 4 of this report.

3.3.2 Otter

Otter have been recorded in the immediate vicinity of the proposed surveys as well as Lower Slaney Estuary and Wexford Harbour (NBDC, 2025). A survey of the south bank

of the River Slaney in the vicinity of the proposed surveys was undertaken in April 2024 and December 2025. A live Otter was recorded on the 4th December 2025 in the River Slaney, upstream of the proposed works locations and on occasional dates during wintering bird surveys undertaken over the preceding years. No other evidence of Otter (e.g. holts, spraints and couches) was recorded during the surveys. Remains of crustaceans were recorded on the fishing pier adjacent to the Ferrycarrig Bridge on the 4th December 2025, although no evidence of Otter was recorded on this pier.

Otter territories are typically between 2 – 32km in length but can be up to 80km (Kruuk, 1995). Otter are likely to be in the River Slaney during the proposed works and can detect underwater frequencies between 1 and 14 kHz (Smith & Jones, 2024). Otter TTS onset has been recorded as 226 dB SPL (Southall et al., 2019). The Sub-Bottom Profiler is within the hearing range for Otter, but the sound output is below the noise levels that could cause injury to Otter (Southall, et al., 2019).

The proposed works provide a source of airborne noise, which has the potential to cause disturbance to otter. Engines and generators operating can produce noise levels ranging from 80–120 dB(A) at the source, which is below the TTS onset for this species, as described above. There is also regular boat traffic in the estuary and otter in the area will be habituated to the presence of vessels and people on the water. There will be no impacts to otters as a result of airborne noise during the proposed works.

The sediment sampling will occur in a small area for a brief period of time i.e. hours. There is a potential risk of suspending contaminants from the sediment during sampling which could lead to heavy metals or other contaminants entering the food chain. However, given the small volume of sediment (5 litres per site) and the shallow grab (15 cm) in comparison the availability of suitable habitat in the Slaney estuary, this risk is negligible.

The noise emitted from a vessel is typically 15-175Db@1m and at a frequency of 0.1-2 kHz. This is within the hearing range of otter although the noise level is below the level that could cause injury to Otter.

Therefore, there will be no offence committed under Section 51 of the Habitats Regulations in relation to otter as a result of the proposed works.

3.3.3 Bat Species

Common Pipistrelle (*Pipistrellus pipistrellus*), Soprano Pipistrelle (*P. pygmaeus*) and Leisler's Bat (*Nyctalus leisleri*), were recorded in the vicinity of the proposed works during bat surveys undertaken by ROD in 2022. A preliminary bat roost suitability assessment undertaken by ROD ecologists in 2025 did not identify any structures or trees in the vicinity of the proposed works with the potential to support roosting bats.

Given the nature, timing and location of the proposed works, as well as existing ambient visual and noise disturbance levels in the area, there will be no significant impacts on bat species as a result of the proposed works. Therefore, as a result of this conclusion, there will be no offence to bat species under Section 51 of the Habitats Regulations as a result of the proposed works.

4.0 MITIGATION

This report has assessed the potential for the proposed works to give rise to impacts on species afforded strict protection under Article 12 of the Habitats Directive which would constitute offences under Section 51 of the Habitats Regulations. In Section 3.3.2 and Section 3.3.3 it was concluded that there will be no deliberate capture, killing, disturbance (particularly during sensitive periods), damage or destruction of breeding and resting places to bat species or otter. In Section 3.3.1, it was determined that, in the absence of mitigation, impacts on cetaceans that would constitute offences under Section 51 of the Habitats Regulations are possible, if individuals were close enough to the proposed works to receive sound levels above their threshold injury levels as a result of the Sub-bottom Profiler and Rotary Drill. Therefore, mitigation measures are proposed in order to endure there will be no significant impacts to cetaceans afforded strict protection under Article 12 of the Habitats Directive as a result of the proposed works which would constitute offences under Section 51 of the Habitats Regulations.

The mitigation measures below are in line with *Guidelines to Manage Risk to Marine Mammals from Man–Made Sounds in Irish Waters* (NPWS, 2014d):

(1) A qualified and experienced marine mammal observer (MMO) shall be appointed to monitor for marine mammals and to log all relevant events using standardised data forms.

(2) Unless information specific to the location and/or plan/project is otherwise available to inform the mitigation process (e.g., specific sound propagation and/or attenuation data) and a distance modification has been agreed with the Regulatory Authority, underwater cable percussive GI and the use of the sub bottom profiler will not commence if marine mammals are detected within the Monitored Zone.

(3) Underwater cable percussive GI and the use of the sub bottom profiler shall only commence in daylight hours where effective visual monitoring, as performed and determined by the MMO, has been achieved. Where effective visual monitoring, as determined by the MMO, is not possible, the sound-producing activities shall be postponed until effective visual monitoring is possible.

(4) An agreed and clear on-site communication signal must be used between the MMO and the works Superintendent as to whether the relevant activity may or may not proceed, or resume following a break. It shall only proceed on positive confirmation with the MMO.

(5) In waters up to 200m deep, the MMO shall conduct pre-start-up constant effort monitoring at least 30 minutes before the sound-producing activity is due to commence. Sound-producing activity shall not commence until at least 30 minutes have elapsed with no marine mammals detected within the Monitored Zone by the MMO.

(6) This prescribed Pre-Start Monitoring shall subsequently be followed by an appropriate Ramp-Up Procedure which should include continued monitoring by the MMO.

(7) In commencing the proposed works where the output peak sound pressure level (in water) from any source including equipment testing exceeds 170 dB re: 1µPa @1m an appropriate Ramp-up Procedure (i.e., “soft-start”) must be used.

(8) Where it is possible according to the operational parameters of the equipment and materials concerned, the underwater acoustic energy output shall commence from a lower energy start-up (i.e., a peak sound pressure level not exceeding 170 dB re: 1µPa @1m) and thereafter be allowed to gradually build up to the necessary maximum output over a period of 20-40 minutes.

(9) This controlled build-up of acoustic energy output shall occur in consistent stages to provide a steady and gradual increase over the ramp-up period.

(10) Where the measures outlined in steps 8 and 9 are not possible, alternatives must be examined whereby the underwater output of acoustic energy is introduced in a consistent, sequential and gradual manner over a period of 20-40 minutes prior to commencement of the full necessary output.

(11) In all cases where a Ramp-Up Procedure is employed the delay between the end of ramp-up and the necessary full output must be minimised to prevent unnecessary high-level sound introduction into the environment.

(12) Once an appropriate and full Ramp-Up Procedure commences, there is no requirement to halt or discontinue the procedure at night-time (if permitted), nor if weather or visibility conditions deteriorate nor if marine mammals occur within the Monitored Zone.

(13) If there is a break in sound output for a period greater than 30 minutes (e.g., due to equipment failure, shut-down or location change) then all Pre-Start Monitoring and a subsequent Ramp-up Procedure (where appropriate following Pre-Start Monitoring) must be undertaken.

(14) For higher output drilling operations which have the potential to produce injurious levels of underwater sound as informed by the associated risk assessment, there is likely to be a regulatory requirement to adopt shorter 5-10 minute break limit after which period all Pre-Start Monitoring and a subsequent Ramp-up Procedure (where appropriate following Pre-Start Monitoring) shall recommence as for start-up.

It is recommended that the mitigation measures presented in Section 4 above are conditions to be attached to any licence granted.

Following the full and complete implementation of the mitigation measures presented in Section 4 above, there will be no negative residual impacts from the proposed works on cetaceans in the area. Provided these mitigation measures are implemented in full, it is unlikely that any animals will be injured as a result of the proposed works.

5.0 CONCLUSION AND RECOMMENDATIONS

This report has assessed the potential for the proposed works to give rise to impacts on species afforded strict protection under Article 12 of the Habitats Directive which would constitute offences under Section 51 of the Habitats Regulations. The above sections have provided the assessment and has concluded that following the full and successful implementation of the mitigation measures, there will be no deliberate capture, killing, disturbance (particularly during sensitive periods), damage or destruction of breeding and resting places on bat species, otter or cetaceans species. Therefore, no offence under Section 51 of the Habitats Regulations will be committed as a result of the proposed development, and as a result, no derogation licence will be required.

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