

Assessment of Risk to Marine Mammals

Proposed extension Port Pier, Inver, Co. Donegal

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for

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1.0 Introduction

Jessica Devlin, Project Management and Environmental Services was commissioned by Ayesa to carry out a Marine Mammal Risk Assessment in relation to the extension of Port Pier, Inver located in inner Inver Bay, Co. Donegal.

Port Pier, Inver is located on the northwestern shoreline of Inver Bay in southwest Donegal between the towns of Killybegs and Donegal Town. It is owned and maintained by Donegal County Council. Activity at Port Inver has increased and diversified over the years, however the pier facilities have not improved to any degree. Modern vessels have been introduced and require better facilities to maintain and care for them.

In order to improve the amenity provided by the pier, Donegal County Council are proposing to construct an extension to the existing pier to accommodate the recent increased activity and improve facilities at the pier. Works will involve the dredging of an area to the east of the pier, piling and associated construction works. The pier is currently used as tides permit, and dredging will improve access to the facility. When works are complete the pier will resume operation, ongoing dredging is not proposed and the pier will continue to be accessed when tides permit.

The area of the proposed works is not within a designated area; however it is hydrologically linked to Special Areas of Conservation (SAC) and Special Protected Areas under the EU Habitats Directive (92/43/EC).

The project has been assessed (AA Screening) (Devlin, 2023) in terms of the likely impacts the proposal may have on the Natura 2000 sites in the area. It has been determined that, although the project works will be temporary and relatively small in the wider context of the marine environment, in the absence of mitigation, the project may pose a risk to: marine habitats, the conservation objectives of St John's Point SAC (000191), Donegal Bay SPA (004145), Donegal Bay (Murvagh) SAC (000133) and other Annex species occurring the bay.

Potential impacts pertain to the construction phase to include the following:

- Habitat degradation due to hydrological impacts
- Disturbance and displacement of QI species and other Annex species
- Reduction in species density of QI species and other Annex species
- Introduction of Invasive Alien Species

A Natura Impact Statement is being prepared at the time of writing, and this report will be a supporting document for same.

2.0 Statement of authority

Jessica graduated from the National University of Ireland, Galway in 1997 with a BSc. honours degree in Geology and obtained a MSc. in Applied Environmental Science from Queens University Belfast in 2001. She attained a National Certificate in Eco-Tourism, from Sligo Institute of Technology in 2005 and in 2014 completed Geographical Information Systems for Environmental Investigations, University College Dublin.

Over the years, Jessica has gained a wide range of experience in research, consultancy and project management with particular emphasis on sustainable development in freshwater, marine and coastal environments.

As field scientist with the Queens University Marine Station in Portaferry, Jessica carried out habitat surveys with respect to the decline of Salmonid populations in Northern Ireland Rivers. She progressed to research assistant with Queens University and the Department of Agriculture & Rural Development. As project manager for the Donegal County Council - Marine & Water Leisure Programme, she managed projects on sustainable development of the marine leisure product. Jessica also worked with the University College Cork Coastal and Marine Research Centre in partnership with Donegal County Council and the University of Ulster, as manager of the Donegal element of a North West Europe Interreg Project called IMCORE (Innovative Management of Europe's Changing Coastal Resource). For the past 11 years Jessica has been self-employed working as a project manager and environmental consultant, specialising in freshwater, marine, coastal and environmental projects. Her client base is wide reaching from state agencies to community groups, individuals, angling clubs and private developers.

3.0 Overview of project proposals

Ayesa has been appointed by Donegal County Council (DCC) as the engineers for the design of the Port Pier extension. The timing of the works will largely depend on statutory and regulatory requirements and receipt of the foreshore license. The project is expected to commence during 2024/2025. The works are expected to be completed within a 6-month period.

The extension will include the addition of two sections: 44.5m x 10.1m to the south and 49.3m x 10.1m in an easterly direction. An additional area of approximately 1121m² behind the existing pier will be reclaimed using predominantly the dredged material. Information was provided by DCC and Ayesa describing how works will be implemented with site layout drawings, see figure 3.1. A construction method statement has been developed, see extract below:

"...The pier structure will consist of two parallel rows of sheet piles adequately tied back with tie-rods. Dredge material will be used as fill between the sheet piles. The top layer of fill will be selected engineered fill. The pier structure will be capped with a concrete deck.

The following sequence describes the construction of the Pier:

- *Sheet piles will be driven into the seabed as shown on the drawings, using an excavator or crane fitted with a vibratory pile hammer (or similar).*
- *The sheet piles tie-back system will be installed, which will consist of a series of tie-rods and waling beams.*
- *The pier will be filled with material either from the dredging operation or selected fill imported from commercial sources.*
- *The fill will be compacted in layers (approximately 300mm) using a 5t roller (or similar).*
- *Selected engineering fill will be used in the top 900mm, to create a base layer for the concrete slab.*
- *The selected fill will be compacted in layers (approximately 300mm) using a 5t roller (or similar).*
- *A reinforced concrete capping slab will be constructed on top of the sheet piles and engineered fill. This will involve installing rebar cages, shuttering, and concrete casting.*

- Quayside services such as lighting, drainage, and utilities shall be installed in accordance with relevant standards and regulations.

Considerations During Construction

All construction activities that have the potential to generate excessive noise or vibration shall be carried out during permitted hours. Noise levels shall be limited to:

- 75 DBA between 8.00hrs – 20.00hrs (Mon to Sat).
- 45 DBA for all other times.

....

Vibration monitoring shall be carried out during piling operations to ensure that vibration levels are kept within acceptable limits.

A dredge pocket will be created, as indicated on the drawings, using an excavator. The dredging operation will either be conducted in the dry during low water, or a barge will be required to support the excavator when the site is inundated with water.

The dredged/excavated material will be used as fill for the new pier extension, if suitable. Furthermore, the area behind the pier will also be reclaimed using the dredged material. The excavator will either dump the dredged material directly between the sheet piles, or it will be loaded onto tipper trucks for transportation. A hopper barge may be required to load and transport the material when the site is inundated. Approximately 3,500m³ of material will be dredged.

If excess dredge material is available, or if the dredge material is unsuitable for use as fill, the material will be transported and disposed of at a suitable landfill facility. The dredge material will first be stored in a bunded area and allowed to dry prior to transportation....”

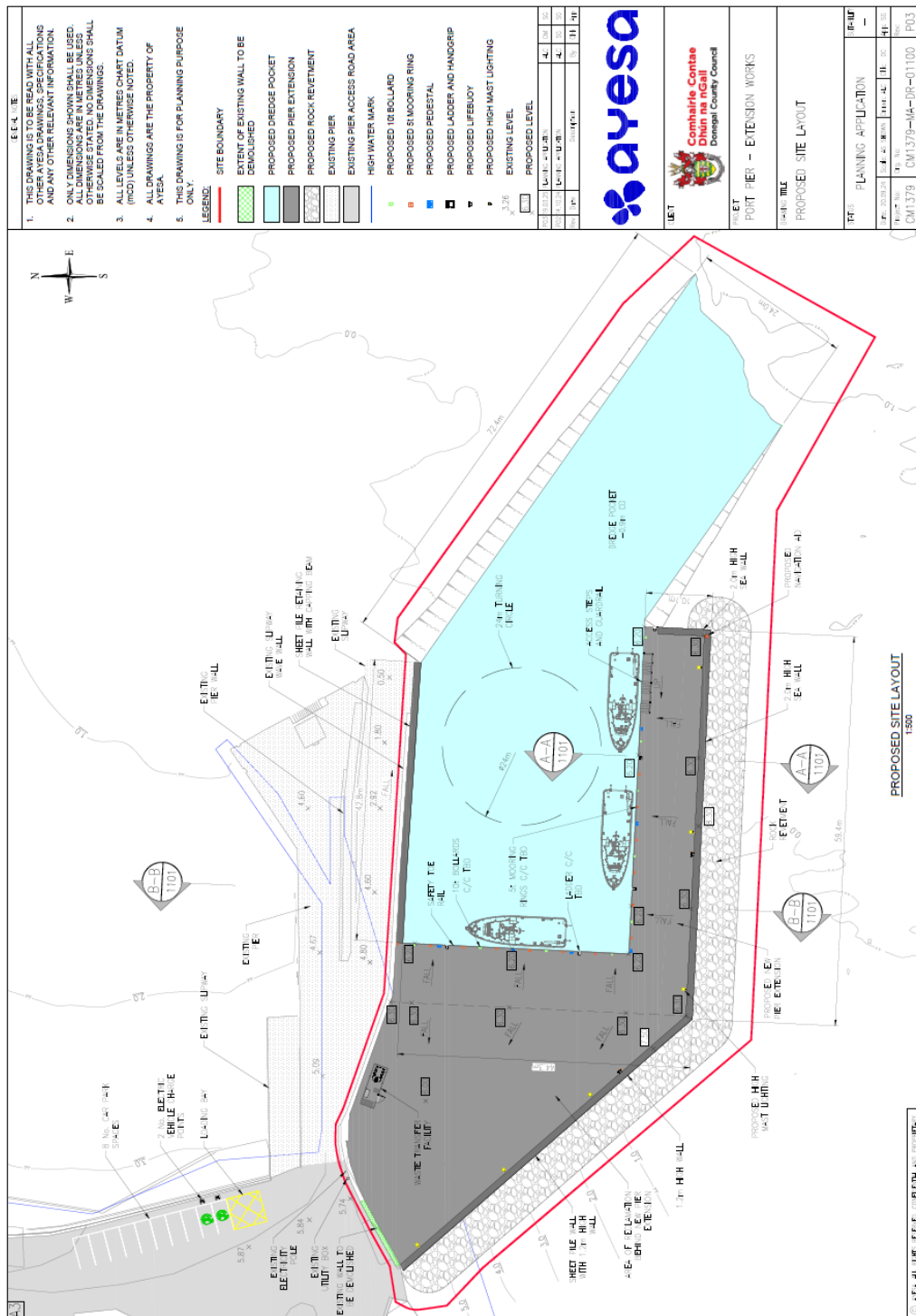


Figure 3.1 Proposed extension layout and dredging pocket, as supplied by Ayesa.

4.0 Legal status of marine mammals in Ireland

Marine mammals (Annex II and Annex IV) and other megafauna

In Ireland, cetaceans (whale, dolphins and porpoises), grey seals (*Halichoerus grypus*), harbour seals (*Phoca vitulina*) and the Eurasian Otter (*Lutra Lutra*) are protected under the Wildlife Act (1976) and amendments (2000-2023). The Act applies out to the 12 nm limit of Irish territorial waters. All cetaceans and otter are also included in Annex IV of the EC Habitats Directive, as species 'in need of strict protection'. Under this Directive, the harbour porpoise (*Phocoena phocoena*), bottlenose dolphin (*Tursiops truncatus*), grey seal, harbour seal and Eurasian Otter are listed under Annex II, which identifies these species of community interest and whose conservation requires the designation of SACs. It is an offence to hunt, injure or willfully interfere with, disturb or destroy the resting or breeding place of a protected species (except under license or permit from the Department).

To date 25 species of cetaceans have been recorded in Irish waters, the harbour porpoise (*Phocoena phocoena* L.) is the most widespread and abundant cetacean species in Irish waters (Rogan and Berrow 1996, as cited in Berrow *et al* 2014) and the grey seal and harbour/common seal are regularly occurring. Otter are frequently occurring around rivers, lakes and coastlines. Harbour seal is a qualifying interest of Donegal Bay (Murvagh) SAC.

Marine Mammal Risk Assessment Guidance

NPWS Guidance to manage the risk to marine mammals from man-made sound sources in Irish waters' (NPWS, 2014) details the potential risks to marine mammals from man-made sounds stating: "An assessment of risk forms an important part of the decision-making framework for mitigating the effects of anthropogenic sound in the marine environment. It is recommended that ... [certain] coastal and marine activities undergo a risk assessment for anthropogenic sound-related impacts on relevant protected marine mammal species, to inform the consenting process."

The NPWS draft guidance states:

"A risk assessment for each marine mammal species of relevance to the proposed works area needs to consider the nature of the sound source, its likely and/or potential effects on individuals and/or populations and on their likely habitat..."

Where an assessment identifies the likelihood of a risk to protected marine mammal species, either by virtue of (a) the proposed operation or activity and/or (b) the sensitivity of a particular site in which the sound-producing operation or activity is proposed, it is recommended that appropriate risk management measures are pursued by the relevant Regulatory Authority."

and

"Following the initial identification and assessment of risk arising from an operation or activity ... a menu of management options is available to Regulatory Authorities in their decision making process and it includes:

A1. Consent without mitigation (e.g., where the risk of any adverse effects has been ruled out)

A2. No consent given for the activity

A3. Avoid critical habitats for marine mammals (e.g., designated sites or other locations identified as sensitive via the risk assessment process)

A4. Avoid operations during key periods of the species' life cycle (e.g., breeding/resting, migration)

A5. Avoid time periods when effective impact mitigation is not possible, and/or

A6. Risk minimisation measures, namely

A6.1. Minimise the duration over which the sound-producing activity is intended to take place;

A6.2. Minimise the individual and cumulative sound pressure and exposure levels delivered into the environment by the activity. If necessary the use of alternative, lower impact equipment and methods should be explored (e.g., vibratory hammer, gravity base piles).

A6.3. Incorporate the use of clear "ramp-up" or "soft-start" procedures, whereby sound energy input to the marine environment is gradually or incrementally increased from levels unlikely to cause significant behavioural impact on marine mammals to the full output necessary for completion of the activity.

A6.4. Incorporate the use of fully enclosing or confined bubble curtains, encircling absorptive barriers (e.g., isolation casings, cofferdams) or other demonstrably effective noise reduction methods at the immediate works site, in order to reduce underwater sound propagation from on-site operations. Studies have shown that such methods can provide a significant reduction in sound input to the wider aquatic environment in the order of 10-30 dB.

A6.5. The use of trained marine mammal observers (MMO's) provides effective means of detecting marine mammals in the vicinity of coastal and marine operations. Associated operational considerations should also be taken into account."

The NPWS guidance document includes measures specific to dredging and piling activities. The guidelines recommend that these and other listed coastal and marine activities be subject to a risk assessment for anthropogenic sound-related impacts on relevant protected marine mammal species to address any area-specific sensitivities, both in timing and spatial extent, and to inform the consenting process. Once the listed activity has been subject to a risk assessment, the regulator may decide to refuse consent, to grant consent with no requirement for mitigation, or to grant consent subject to specified mitigation measures, see figure 4.1.

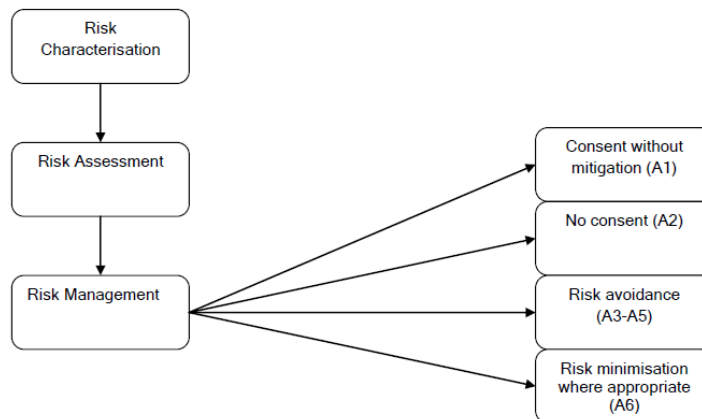


Figure 4.1 Flow diagram illustrating the staged process towards managing risk (DAHG, 2014).

A marine mammal risk assessment is therefore a requirement for the application of statutory permissions at Port pier, Inver. This marine mammal risk assessment will consider the following based on the National Parks and Wildlife Service guidance document (DAHG, 2014); 1) Source, 2) Species and 3) Environment.

- Source; Noise from dredging activities (using an excavator), Noise and vibration will result from piling activities.
- Species; based on assessment from various data sources on the species of marine mammals occurring within the proposed dredging and piling locations as well as surrounding areas.
- Environment; where dredging activities, piling and construction will take place, marine mammal occurrence within these areas will be assessed.

5.0 Source: noise

The ocean is a noisy place with noises coming from both natural and anthropogenic sources; creating background or ambient noise levels. Interference with the detection of natural sounds has the ability to impact on marine mammals to some extent. If noise levels are at an animals' most sensitive hearing frequency, sounds can result in Temporary Threshold Shift (TTS)¹ and Permanent Threshold Shift (PTS)². Lower intensity sounds could cause changes in behavior for example avoidance and vocalisation alterations. Masking³ can also reduce the ranges at which mammals communicate (Todd *et al* 2015). Under Irish legislation, it is an offence to disturb or injure a marine mammal whether this occurs via introduced sound or another anthropogenic source (DAHG, 2014). It is

¹ Temporary Threshold Shift: A temporary increase in hearing threshold following exposure to loud noise.

² PTS: Permanent Threshold Shift: A permanent increase in hearing threshold following exposure to loud noise.

³ Sounds which coincide with hearing ranges of a marine mammal mask important signals and reduce the distance over which individuals can communicate.

considered that anthropogenic sound sources with the potential to induce TTS in a receiving marine mammal contain the potential for both (a) disturbance, and (b) injury to the animal (DAHG, 2014).

It is important therefore to understand marine mammal hearing ranges and abilities. Table 5.1 outlines the marine mammal auditory abilities and marine frequencies including transcript of marine mammal noise exposure criteria for commonly occurring marine mammals in Irish waters.

Cetacean species have been distinguished by three groupings related to their known auditory ability and functional frequencies (DAHG, 2014). Seals and other Pinnipeds demonstrate differing auditory ability in air and in water, so from a functional point of view they have been subdivided into two groups: (i) pinnipeds in water, and (ii) pinnipeds in air.

Table 5.2 discusses the underwater sound information, relevant to activities proposed the project at Port Pier.

Low frequency 7 Hz-22 kHz	Cetaceans Mid-frequency 150 Hz-160 kHz	High frequency 200 Hz-180 kHz	Pinnipeds in water 75 Hz-75 kHz	Pinnipeds in air 75 Hz-30 kHz
Baleen whales	Most toothed whales, dolphins	Certain toothed whales, porpoises	All species	All species
Species- Ireland Humpback whale Blue whale Fin whale Sei whale Minke whale	Species- Ireland Sperm whale Killer whale Long-finned pilot whale - Beaked whale species Dolphin species	Species- Ireland Pygmy sperm whale Harbour porpoise	Species- Ireland Grey seal Harbour seal	Species- Ireland Grey seal Harbour seal
Criteria for permanent injury – estimated values for PTS onset				
Single Pulse: 230 dB SPL ⁴ 198 dB SEL ⁵	Single Pulse: 230 dB SPL 198 dB SEL	Single Pulse: 230 dB SPL 198 dB SEL	Single Pulse: 218 dB SPL 186 dB SEL	Single Pulse: 149 dB SPL 144 dB SEL
Multiple Pulse: 230 dB SPL 198 dB SEL	Multiple Pulse: 230 dB SPL 198 dB SEL	Multiple Pulse: 230 dB SPL 198 dB SEL	Multiple Pulse: 218 dB SPL 186 dB SEL	Multiple Pulse: 149 dB SPL 144 dB SEL
Non Pulses: 230 dB SPL 215 dB SEL	Non Pulses: 230 dB SPL 215 dB SEL	Non Pulses: 230 dB SPL 215 dB SEL	Non Pulses: 218 dB SPL 203 dB SEL	Non Pulses: 149 dB SPL 144.5 dB SEL
Criteria and values for TTS onset (single pulses only) and Disturbance/ behavioural response (multiple pulses/non pulses)				
Single Pulse: 224dB SPL 183 dB SEL	Single Pulse: 224dB SPL 183 dB SEL	Single Pulse: 224dB SPL 183 dB SEL	Single Pulse: 212 dB SPL 171 dB SEL	Single Pulse: 109 dB SPL 100 dB SEL
Multiple Pulse: 120 – 180 dB RL Not applicable	Multiple Pulse: 120 – 180 dB RL Not applicable	Multiple Pulse: Data unavailable Not applicable	Multiple Pulse: 150 – 200 dB RL Not applicable	Multiple Pulse: Data unavailable Not applicable
Non Pulses: 120 – 160 dB RL Not applicable	Non Pulses: 90 – 200 dB RL Not applicable	Non Pulses: 90 – 170 dB RL Not applicable	Non Pulses: 100+ dB RL Not applicable	Non Pulses: 110 – 120 dB RL Not applicable
Units of measurement Sound Pressure Level, SPL (in water): measured in dB re: 1µPa (peak) (flat) Sound Exposure Level, SEL (in water): measured in dB re: 1µPa ² -s Sound Pressure Level, SPL (in air): measured in dB re 20µPa (peak) (flat) Sound Exposure Level, SEL (in air): measured in dB re: (20µPa) ² -s				

Table 5.1 Marine mammal auditory abilities and marine frequencies including transcript of marine mammal noise exposure criteria given by Southall *et al* (as cited in DAHG 2014). Includes received levels (RL) from multiple pulse / non pulse events reported to elicit significant behavioural responses in previous studies, with respect to Irish occurring species. Extract from DAHG, 2014.

⁴ Sound pressure level

⁵ Sound exposure level

Source	Sound Pressure Level dB re: 1µPa@1m	Sound Exposure Level. dB re: 1µPa ² -s	Sound duration Seconds	Peak Frequency Hz	Band width Hz	Direction
Pile driving (4m diameter monopile)	192-261	210-215	-	-	100-1000	Omni
Dredging (suction/hopper)	177	-	constant	80-200	20-8000	Omni
Fishing vessel (12m long @ 7 knots)	150	-	constant	300	250-1000	Omni

Table 5.2 Extract from DAHG, 2014. Examples of general underwater sound information from a range of anthropogenic sources, ordered by their potential for introduction of high level sound (based on information in Hildebrand1; Richardson *et al.*3; OSPAR45; Nedwell & Howell as cited in DAHG, 2014)

Pile driving

Pile driving is a static activity that usually takes place in a fixed location for a prolonged period of days or weeks, depending on the scale of development. It therefore, has the potential, in most circumstances, to introduce persistent anthropogenic sound at levels that may impact upon marine mammal individuals and/or populations, and would constitute an important conservation risk (DAHG 2014).

Piling (pile driving) refers to the hammering of piles into the seabed. Usually this is carried out by hydraulic hammers, but vibratory piling involves the use of hydraulically powered vibrating probes, known as vibroflots. Choice of pile depends upon type, size and weight of the structure to be supported, and the depths and physical properties of the sea bed (Todd *et al*, 2015).

Piling is a source of high amplitude, low frequency, impulsive sound (Robinson *et al*, 2012, as cited in Todd *et al* 2015). Noise in air, in water and in seabed needs to be considered in order to measure acoustic impact fully. (Robinson *et al*, 2012, as cited in Todd *et al*, 2015). Piling is usually carried out on shallow coastal waters, where local conditions have an impact on how sound travels, noise levels depend on pile size, hammer strike energy and nature of the sea bed. Robinson *et al* 2012 (as cited in Todd *et al*, 2015) took measurements around a 5m diameter pile in water 15-20m depth. Hydraulic hammers with typical strike energies of 1000kj were used, for which the majority of noise was <10kHz. Results estimated that the noise level at 0.1kHz was >60dB above background at 380m from the pile, reducing to <40dB above background at 5km. Robinsons research supports NPWS guidance which states: *Pile driving strikes have generally been reported to produce low frequency pulse sounds of several tens of Hz to several thousand Hz (and up to approximately 20 kHz), with some technologies introducing underwater sound at comparatively high sound pressure levels exceeding 220 dB re: 1 µPa, see table 5.1 and 5.2. This presents the possibility PTS, TTS or other injury for some marine mammals in close proximity to such operations. The multiple pulses of some pile driving works can also be detected at received levels (RL) well exceeding ambient sound (>120 dB re: 1 µPa) more than 10km from the operating source, sufficiently high therefore to potentially cause significant behavioural disturbance to marine mammals at distances of several kilometres, DAGH 2014.*

Avoidance and behavioral changes are also possible (Todd *et al*, 2015). Given that piling noise is impulsive and loud, under suitable conditions, numerous marine mammal species can potentially be at risk from masking and pinnipeds could also be affected by noise in air (Todd *et al*, 2015). Marine mammal prey could be affected by piling (Todd *et al*, 2015).

Dredging

Marine dredging is the excavation of substratum from the seabed and disposing of it at a different location. Dredging activity usually occurs in a fixed area for a prolonged period of days or weeks. Therefore it has the potential to introduce continuous anthropogenic sound at levels that may impact upon marine mammal individuals and/or local populations and the risk of acoustic impacts associated with this activity should be considered to ensure good environmental management.

Dredging produces continuous broadband low frequency sound below 1kHz with Sound Pressure Levels (SPLs) between 168-186 dB re 1µPa @ 1m (Todd *et al* 2015). This research supports NPWS guidance which state that static seabed-related activities such as dredging, while generally of less concern, may produce underwater sound at sound pressure levels up to 190 dB re: 1 µPa and at frequencies overlapping marine mammal hearing, thereby increasing the potential for auditory masking, avoidance and other disturbance effects (DAHG, 2014).

6.0 Species: marine mammal activity in the area

25 species of cetaceans have been recorded in Irish waters and the Grey Seal and Harbour/Common Seal are regularly occurring. There is a wide diversity of habitats available from the relatively shallow <200m continental shelf to the deep waters >2000m off the west coast of Ireland. Seals breed around the shorelines of Ireland and have a wide range of habitat in coastal and offshore waters for foraging and commuting to haul out sites. Harbour Seal is a qualifying interest of Donegal Bay (Murvagh) SAC. Otter are frequently occurring around rivers, lakes and coastlines.

The presence of marine mammals in any one area can be affected by a large number of factors including habituation to ships and boat traffic, or the presence of other cetacean species within a site. For example, the latter may influence the distribution and densities of harbour porpoise. Bottlenose dolphins are regularly recorded in Donegal Bay (Ingram *et al.* 2003; Berrow *et al.* 2008 as cited in Berrow *et al.*, 2014) and the density of harbor porpoises in the bay might vary depending on their presence, as Bottlenose dolphins are known to attack and kill harbour porpoises (Ross and Wilson 1996 as cited in Berrow *et al.*, 2014). However, if dolphins in an area are transient, harbour porpoise densities may increase when dolphins are absent (Berrow *et al.*, 2014).

The following data sources were used to ascertain the occurrence of marine mammals in the wider area (c.20km) around Inver Bay

- National Biodiversity Data Centre (NBDC) – online database 29 June 2023
- The Irish Whale and Dolphin Group – data request 06 June 2023
- Department of Arts, Heritage and the Gaeltacht (2014) Guidance to management the risk to marine mammals from man-made sound sources in Irish waters. Dublin, Ireland. DAHG.
- Online data available on European sites and protected habitats/species as held by the National Parks and Wildlife Service (NPWS) from www.npws.ie, including Article 17 data.

Biodiversity Ireland has a data base of recorded Otter sightings and other marine mammals. The Irish Whale and Dolphin Group operate an online validated database of cetacean sightings and other megafauna including basking sharks and sea turtles.

Otter has been recorded within Inver Bay, but not in recent years (Biodiversity Ireland, 2023). Basking Shark, Bottlenose Dolphin, Harbour Porpoise, Common Dolphin and Minke Whale have all been recorded in the waters around Inver Bay, McSwynes Bay, St. Johns Point and Donegal Bay within the past 10 years (IWDG, 2022).

It should be noted that the absence of data for an area does not imply that protected or threatened species are not present within the given area.

6.1 National Biodiversity Data Centre Online mapping system

The proposed project is at the western edge of national grid square G87. This and grid square G77 have been searched for records of marine mammals Otter, Grey and harbor seal and Cetaceans. Reports for 10km square were generated on the NBDC data base, see figures 6.1 – 6.3 and tables 6.1 to 6.3.

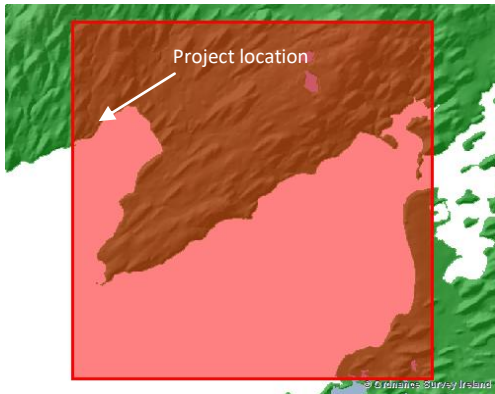


Figure 6.1 Grid square G87. Information from the National Biodiversity Data Centre downloaded from Biodiversity Maps on [29 06 2023].

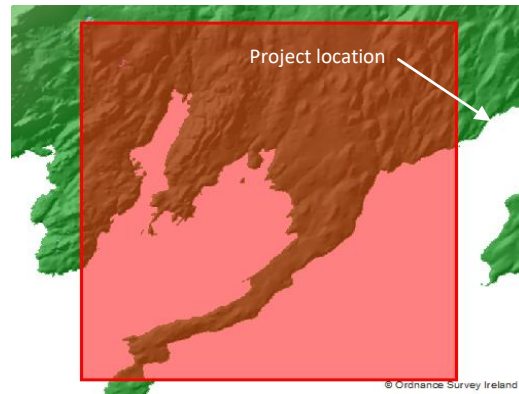


Figure 6.2 Grid square G77. Information from the National Biodiversity Data Centre downloaded from Biodiversity Maps on [29 06 2023].



Figure 6.3 Grid square locations in Ireland. . Information from the National Biodiversity Data Centre downloaded from Biodiversity Maps on [29 06 2023].

Otter (*Lutra lutra*)

Otter was previously listed as “near threatened” in Ireland in the Ireland (Marnell *et al.*, 2009), however following a revised assessment in Marnell *et al.* (2019) its conservation status is now listed as “least concern”. It is believed that this is due to population recovery (Marnell *et al.*, 2019) and Ireland is a stronghold for Otter, and they are widespread and relatively common throughout the island (Reid *et al.*, 2013).

There were no recent NBDC or other recordings of Otter within the project area, see table 6.1, however it is likely that the Eany River and Drumnakilly River have populations of Otter that may use the coastal area for foraging.

Grid square	Species Group	Species name	Record count	Date	Database	Designation
G87	terrestrial mammal	European Otter (Lutra lutra)	6	08/03/1996	Atlas of Mammals in Ireland 2010-2015	Protected Species: EU Habitats Directive Annex II, Annex IV. Wildlife Acts.
G77	terrestrial mammal	European Otter (Lutra lutra)	7	31/08/2010	Atlas of Mammals in Ireland 2010-2015	Protected Species: EU Habitats Directive Annex II and Annex IV. Wildlife Acts.

Table 6.1 National Biodiversity Data Centre Records of Otter within grid square G77 and G87. Information from the National Biodiversity Data Centre downloaded from Biodiversity Maps on [29 06 2023].'

Harbour seal and grey seal

Harbour seal is a successful aquatic predator that feeds on a wide variety of fish, cephalopod and crustacean species. For individual harbour seals of all ages, intervals between foraging trips in coastal or offshore waters are spent resting ashore at terrestrial or intertidal haul-out sites, or in the water (NPWS, 2012). Current haul out sites described in Donegal Bay (Murvagh) SAC are broadly within the following areas: sandbank areas in inner Hassan's Point, at St. Ernan's Island, to the west of Rooney's Island and east of Rossilly adjacent to Inishnevin, see figure 6.4. Harbour seal count data obtained in 2010 (143 individuals) from inner Donegal Bay continues to demonstrate the sites importance on both regional and national scales. Recorded maximum counts were lower than in the previous year (209 individuals); this may have been compounded to an extent by the restricted visibility of haul-out groups in the survey area (NPWS, 2011).

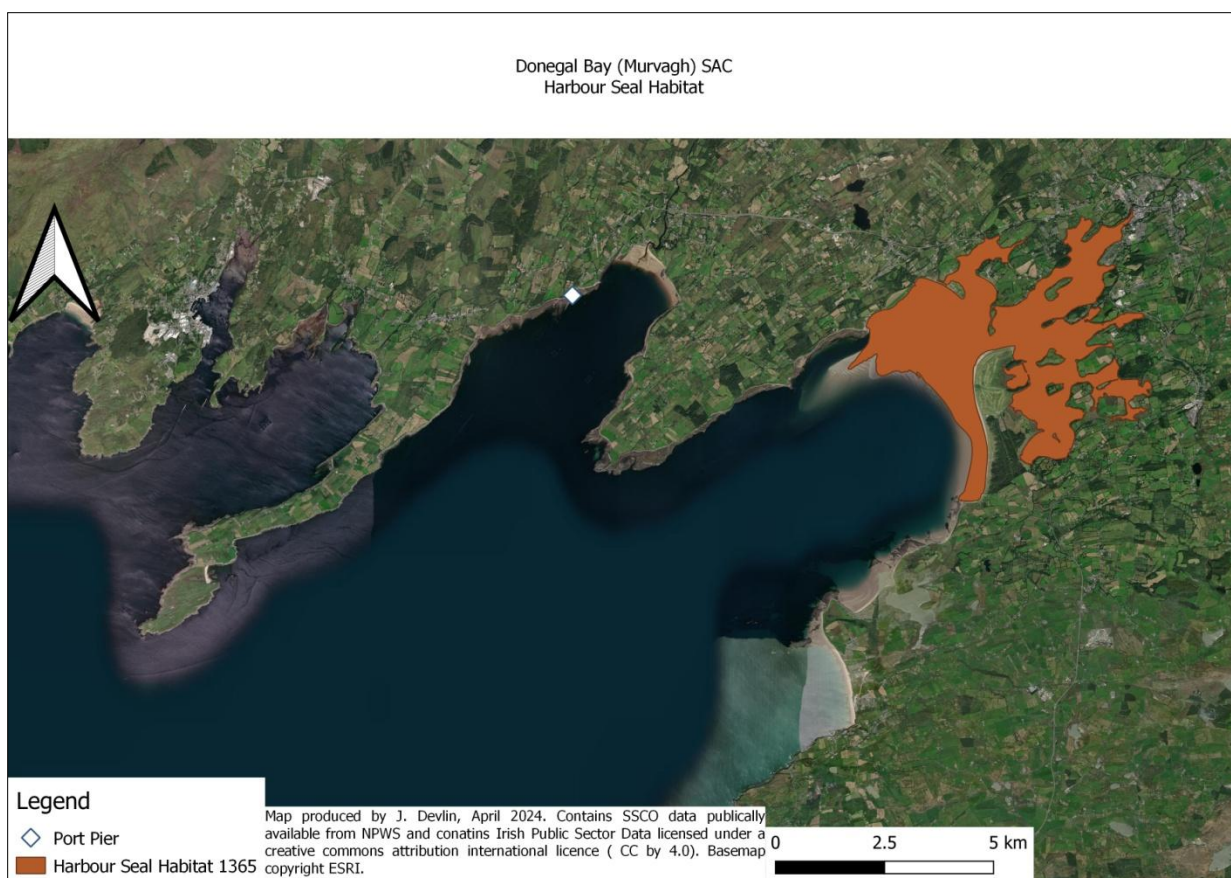


Figure 6.4. Harbour seal habitat in Donegal Bay (Murvagh) SAC

Grey seals are highly mobile and may remain at sea for extended periods, especially outside the breeding season travelling distances of several hundred kilometres from breeding colonies (Cronin *et al.* 2013).

NBDC recordings within Grid 87 include 24 harbour seal recordings in 2009 and 7 grey seal recordings in 2018. Within Grid 77, 8 harbour seals and 7 grey seals were recorded in 2011. Another seal was recorded in 2021 (species unknown) see table 6.2.

In August of 2017 and 2018, the Sea Mammal Research Unit (SMRU) of the University of St Andrews carried out an aerial thermal-imaging survey of harbour seal (*Phoca vitulina*) and grey seal (*Halichoerus grypus*) numbers and distribution around Ireland. The survey was commissioned by the National Parks and Wildlife Service (NPWS), Department of Culture, Heritage and the Gaeltacht (DCHG) and it was the third such nationwide survey of seals in Ireland in summer.

In the 2017/2018 survey, 4,007 harbour seals were counted, compared with 3,489 counted in 2011/2012 (Duck & Morris, 2012; 2013). In 2017/2018, 3,698 grey seals were counted in Ireland compared with 2,964 counted in 2011/2012 and 1,309 counted in 2003. The survey results suggest that the populations of both species are either stable or increasing in all regions of Ireland. The 2017/2018 survey produced the highest total count of the three nationwide summer surveys for both species. The 2017/2018 survey found that there is currently only very little spatial overlap between major haul-out aggregations of harbour seals and grey seals (Duck and Morris, 2018).

The survey recorded Harbour Seal haul out areas at Donegal Bay and on the southern side of St. John's Point. Grey seals in lower numbers were recorded at St. John's point also, but at a different location, see Figure 6.5.

Grid square	Species Group	Species name	Record count	Date	Database	Designation
G87	marine mammal	Common seal (<i>Phoca vitulina</i>)	24	03/09/2009	NPWS Seal Database	Protected Species: EU Habitats Directive, Annex II, Annex V. Wildlife Acts
G87	marine mammal	Grey seal (<i>Halichoerus grypus</i>)	7	14/10/2018	Mammals of Ireland 2016-2025	Protected Species: EU Habitats Directive, Annex II, Annex V. Wildlife Acts
G87	marine mammal	Phocidae	1	02/01/2021	Explore Your Shore	
G77	marine mammal	Grey seal (<i>Halichoerus grypus</i>)	6	16/08/2011	NPWS Seal Database	Protected Species: EU Habitats Directive, Annex II, Annex V. Wildlife Acts
G77	marine mammal	Common seal (<i>Phoca vitulina</i>)	8	16/08/2011	NPWS Seal Database	Protected Species: EU Habitats Directive Annex II, Annex V. Wildlife Acts

Table 6.2 National Biodiversity Data Centre Records of seal species within Grid Square 77 and 87. Information from the National Biodiversity Data Centre downloaded from Biodiversity Maps on [29 06 2023].

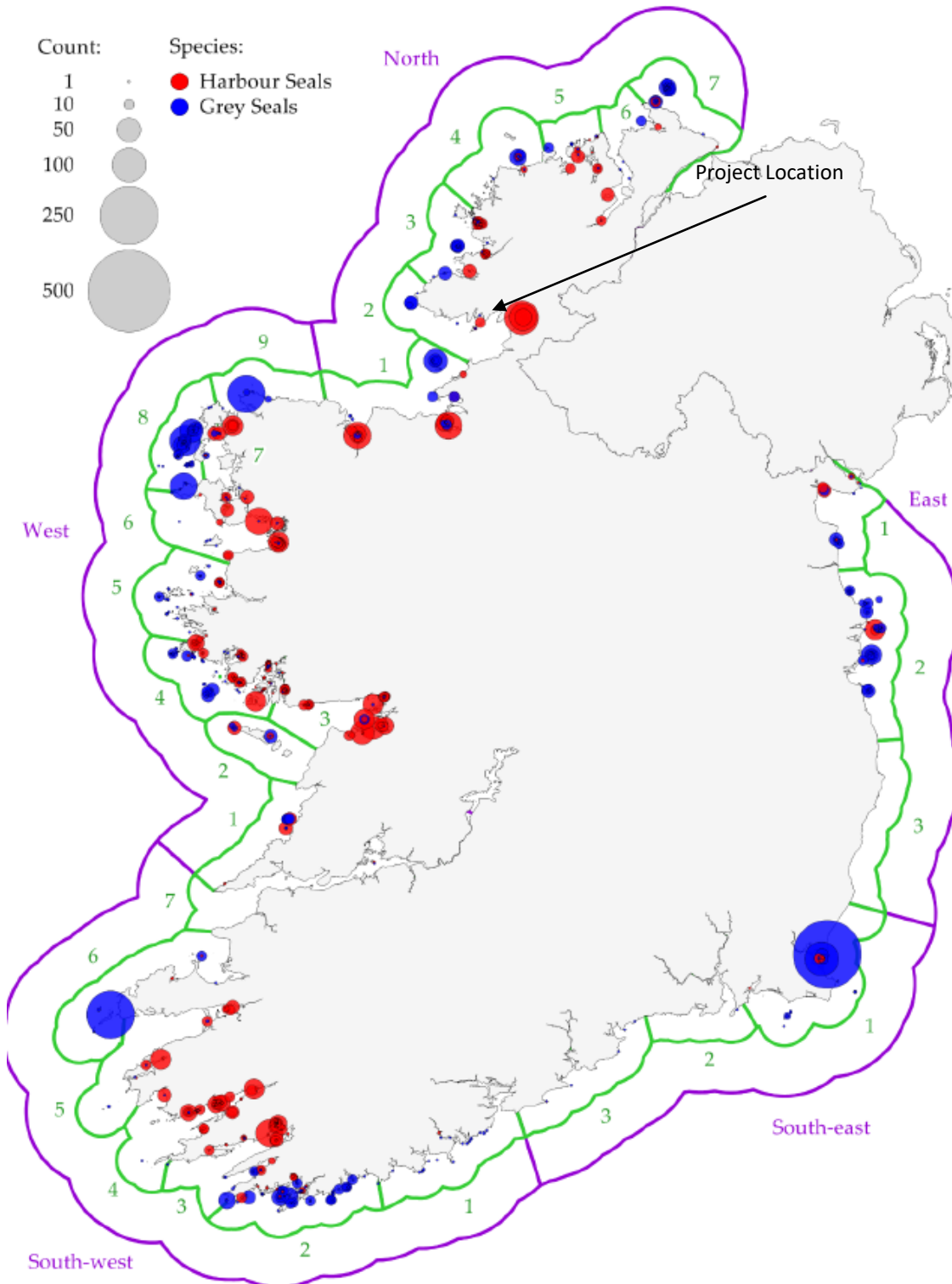


Figure 6.5 Numbers and distribution of Harbour Seals (red circles) and Grey Seals (blue circles) in Ireland in August 2017 and August 2018. The displayed symbol size represents the recorded group size with count guides given in the Legend (top left) (Morris & Duck, 2019).

NBDC cetacean recordings

The NBDC database shows a wide range of cetacean species within the Grid 87 and 77, see table 6.3. Species include bottlenosed dolphin (*Tursiops truncatus*), common dolphin (*Delphinus delphis*), common porpoise (*Phocoena phocoena*), white-beaked dolphin (*Lagenorhynchus albirostris*), atlantic white-sided dolphin (*Lagenorhynchus acutus*), risso's dolphin (*Grampus griseus*), minke whale (*Balaenoptera acutorostrata*), sperm whale (*Physeter macrocephalus*), and northern right whale (*Eubalaena glacialis*). Most recordings have been within the past 10 years or so.

Grid square	Species Group	Species name	Record count	Date	Database	Designation
G77	marine mammal	Bottlenosed dolphin (<i>Tursiops truncatus</i>)	13	18/08/2020	IWDG Casual Cetacean Sightings	Protected Species: EU Habitats Directive Annex II and Annex IV. Wildlife Acts
G77	marine mammal	Common dolphin (<i>Delphinus delphis</i>)	4	14/08/2020	IWDG Casual Cetacean Sightings	Protected Species: EU Habitats Directive Annex IV. Wildlife Acts
G77	marine mammal	Common or striped dolphin	2	28/07/2019	IWDG Cetacean Strandings Database	
G77	marine mammal	Common porpoise (<i>Phocoena phocoena</i>)	1	08/12/2019	IWDG Cetacean Strandings Database	Protected Species: EU Habitats Directive Annex II Annex IV Wildlife Acts Threatened Species: OSPAR Convention
G77	marine mammal	Dolphin species	3	29/05/2020	IWDG Casual Cetacean Sightings	
G77	marine mammal	Dolphin species possibly harbour porpoise	1	09/08/2020	IWDG Casual Cetacean Sightings	
G77	marine mammal	Minke whale (<i>Balaenoptera acutorostrata</i>)	7	23/04/2016	IWDG Casual Cetacean Sightings	Protected Species: EU Habitats Directive Annex IV. Wildlife Acts.
G77	marine mammal	Northern right whale (<i>Eubalaena glacialis</i>)	3	31/12/1763	Records of North Atlantic Right Whales (<i>Eubalaena glacialis</i>) in Irish waters	Protected Species: EU Habitats Directive Annex IV. Wildlife Acts. Threatened Species: OSPAR Convention

G77	marine mammal	Sperm whale (<i>Physeter macrocephalus</i>)	1	29/04/2001	IWDG Cetacean Strandings Database	Protected Species EU Habitats Directive Annex IV. Wildlife Acts.
G77	marine mammal	Whale species	1	09/08/2020	IWDG Casual Cetacean Sightings	
G77	marine mammal	White-beaked dolphin (<i>Lagenorhynchus albirostris</i>)	1	25/02/2012	IWDG Cetacean Strandings Database	Protected Species: EU Habitats Directive Annex IV. Wildlife Acts.
G87	marine mammal	Atlantic white-sided dolphin (<i>Lagenorhynchus acutus</i>)	1	10/11/2013	IWDG Cetacean Strandings Database	Protected Species: EU Habitats Directive Annex IV. Wildlife Acts.
G87	marine mammal	Bottlenosed dolphin (<i>Tursiops truncatus</i>)	2	30/06/2020	IWDG Casual Cetacean Sightings	Protected Species: EU Habitats Directive Annex II, Annex IV. Wildlife Acts.
G87	marine mammal	Common dolphin (<i>Delphinus delphis</i>)	3	26/12/2020	IWDG Cetacean Strandings Database	Protected Species: EU Habitats Directive Annex IV. Wildlife Acts
G87	marine mammal	Common or striped dolphin	1	10/11/2019	IWDG Cetacean Strandings Database	
G87	marine mammal	Common porpoise (<i>Phocoena phocoena</i>)	3	04/02/2013	IWDG Cetacean Strandings Database	Protected Species: EU Habitats Directive Annex II, Annex IV. Wildlife Acts Threatened Species: OSPAR Convention
G87	marine mammal	Dolphin species possibly harbour porpoise	2	23/11/2017	IWDG Casual Cetacean Sightings	
G87	marine mammal	Northern right whale (<i>Eubalaena glacialis</i>)	2	31/12/1987	Records of North Atlantic Right Whales (<i>Eubalaena glacialis</i>) in Irish waters	Protected Species: EU Habitats Directive Annex IV. Wildlife Acts. Threatened Species: OSPAR Convention
G87	marine mammal	Risso's dolphin (<i>Grampus griseus</i>)	1	09/07/2003	IWDG Cetacean Strandings Database	Protected Species: EU Habitats Directive Annex IV. Wildlife Acts.
G87	marine mammal	Striped dolphin (<i>Stenella coeruleoalba</i>)	7	20/02/2013	IWDG Cetacean Strandings Database	Protected Species: EU Habitats Directive Annex IV. Wildlife Acts.

Table 6.3 National Biodiversity Data Centre Records of cetacean sightings within Grid Square 77 and 87. Information from the National Biodiversity Data Centre downloaded from Biodiversity Maps on [29 06 2023].

6.2 Irish Whale and Dolphin Group Database sightings of cetacean species

The Irish Whale and Dolphin Group operate an online validated database of cetacean sightings and other megafauna including basking sharks and sea turtles. Data was procured from the Irish Whale and Dolphin Group in order to map the sighting records over the past decade, around the proposed works to include Inver Bay, Donegal Bay, McSwynes Bay and St. John's Point out to a distance of approximately 20km, see figure 6.6.

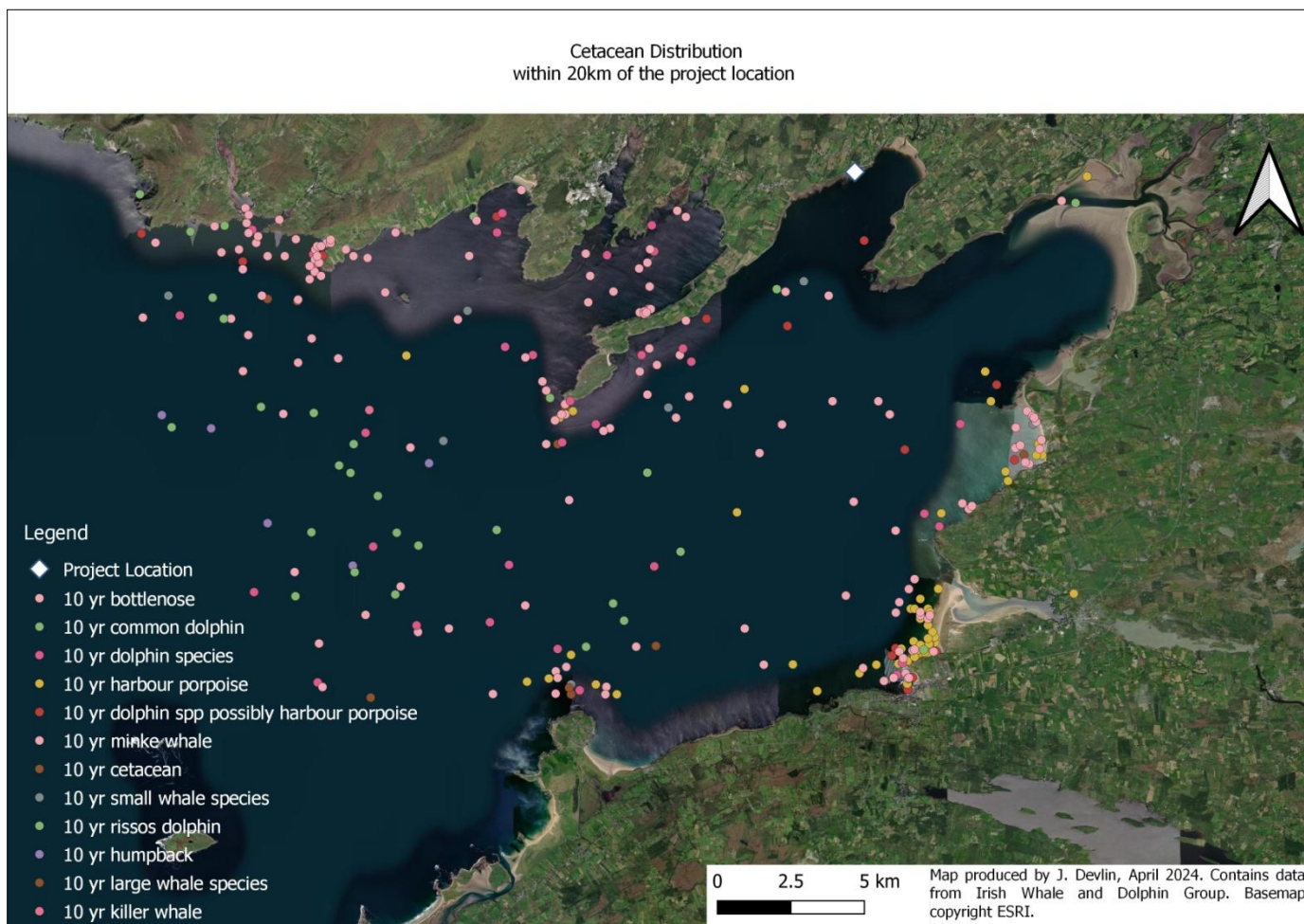


Figure 6.6 Map of cetacean distribution in and around Inver Bay, St. John's Point and Donegal Bay 2013-2022.

It can be seen from the data that there is a significant amount of cetacean activity within the area. Bottlenose dolphins, common dolphins, minke whale, harbour porpoise and other unidentified whale and dolphin species have been recorded in the vicinity of the project location.

337 sightings (mostly casual) were recorded and verified in the 10 yrs 2013-2022, comprising 8 species, of which the biggest no. are of bottlenose dolphin at 1,436 followed by 897 common dolphin, 678 dolphin of undetermined species, 190 harbour porpoise and 75 possible porpoise, 71 minke whale, 21 undetermined cetacean species, 8 undetermined whale species, 7 rissos dolphin, 5 humpback whale, 2 killer whale and 2 Fin whale. 3,436 individuals were recorded in total; a breakdown of individuals recorded can be seen in table 6.4.

Individuals Recorded	Species
1436	bottlenose
897	common dolphin
678	dolphin spp
190	harbour porpoise
75	dolphin poss harbour porpoise
71	minke whale
21	cetacean species
8	whale species
7	rissos
5	humpback whale
3	large whale species
2	killer whale
2	large fin

Table 6.4 Breakdown of individual cetaceans recorded within 20km of the project area 2013-2022 by species, in descending order. Data provided by Irish Whale and Dolphin Group.

The spring / summer of 2023 also saw several humpback whales feeding continually within Donegal Bay among impressive numbers of bluefin tuna, common dolphins and minke whales and the occasional fin whale (IWDG, 2024).

6.3 Marine mammal distribution and habitat in Irish waters NPWS Guidance Document (DAHG, 2014)

Appendix 4 of NPWS Guidance Document (NPWS, 2014): This NPWS publication provides generalised maps of marine mammal distribution and habitat in Irish waters see figures 6.7 to 6.10. These groups of maps indicate that there is habitat suitable for many cetacean species in waters adjacent to the proposed works.

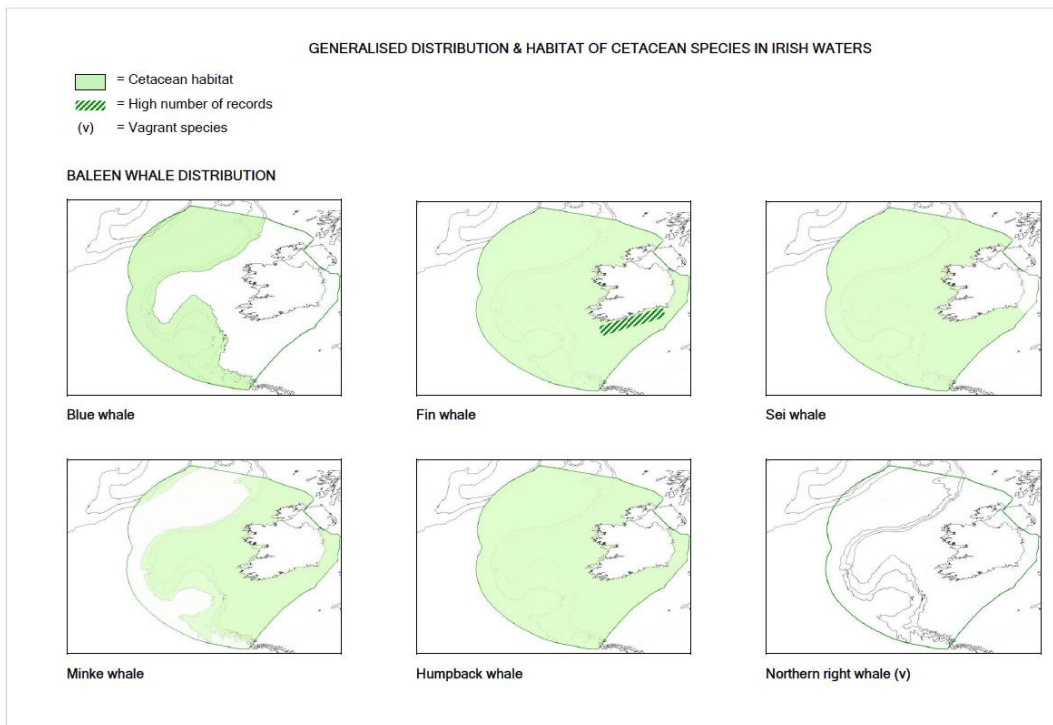


Figure 6.7 Generalised Baleen whale distribution and habitat in Irish waters (DAHG, 2014.)

TOOTHED WHALE & DOLPHIN DISTRIBUTION

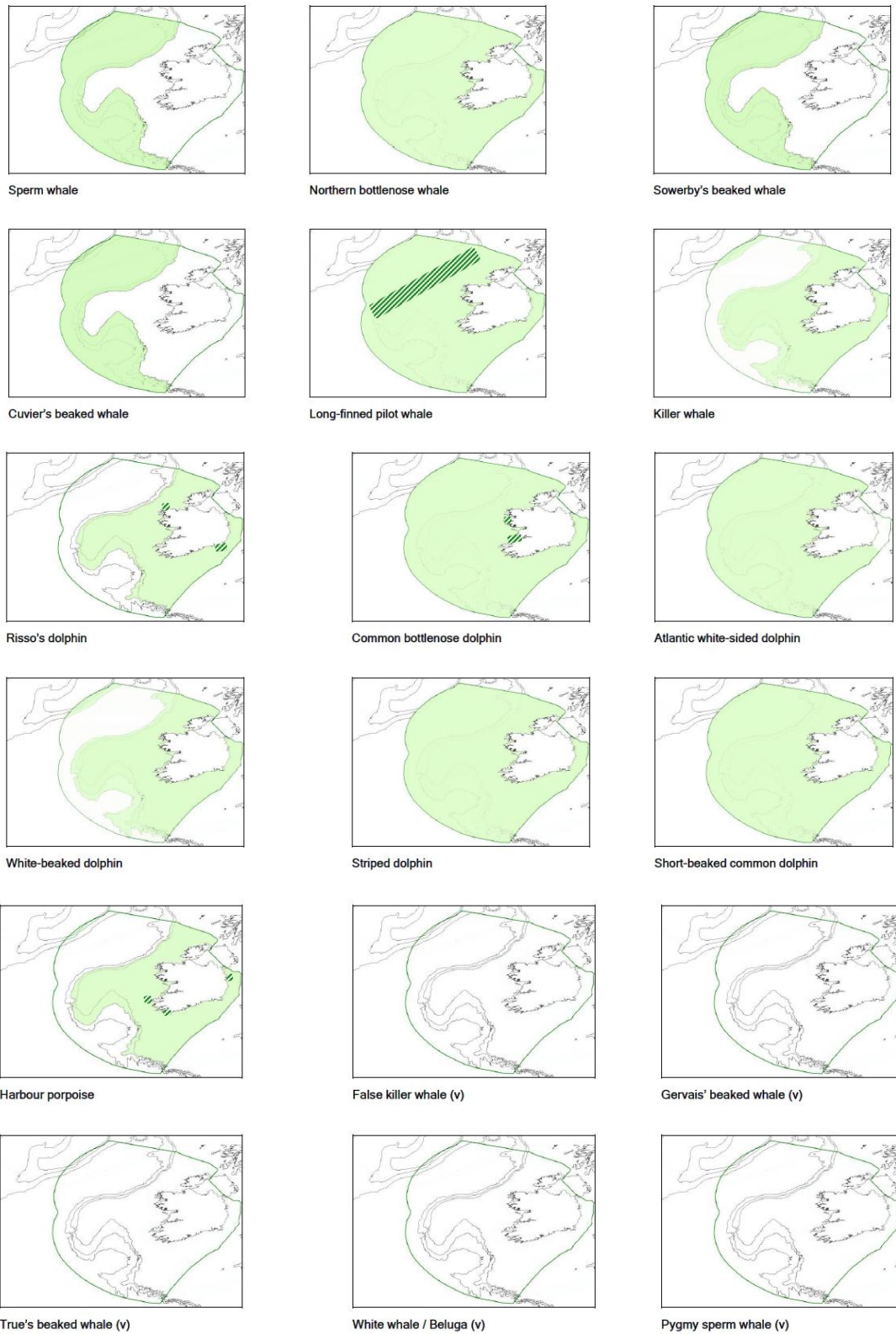
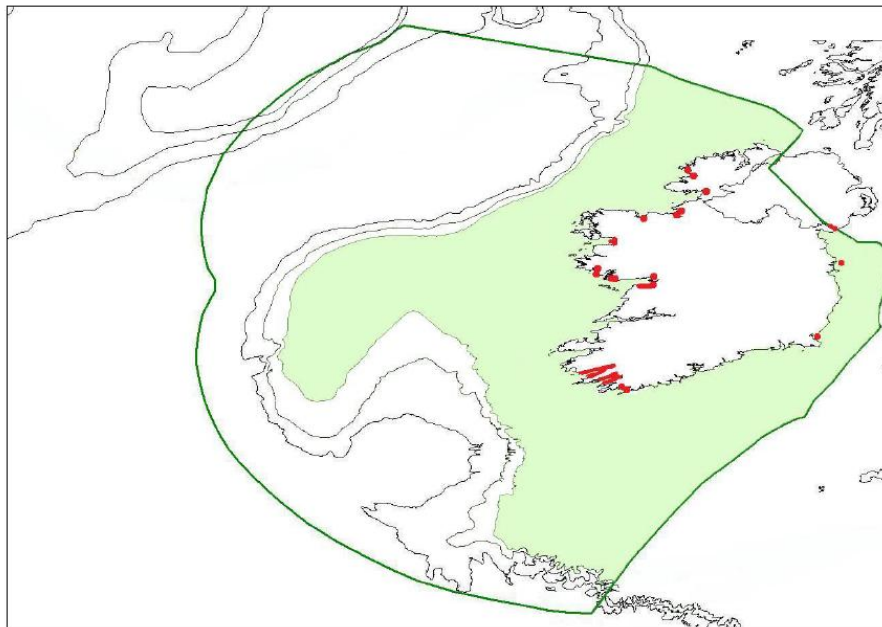


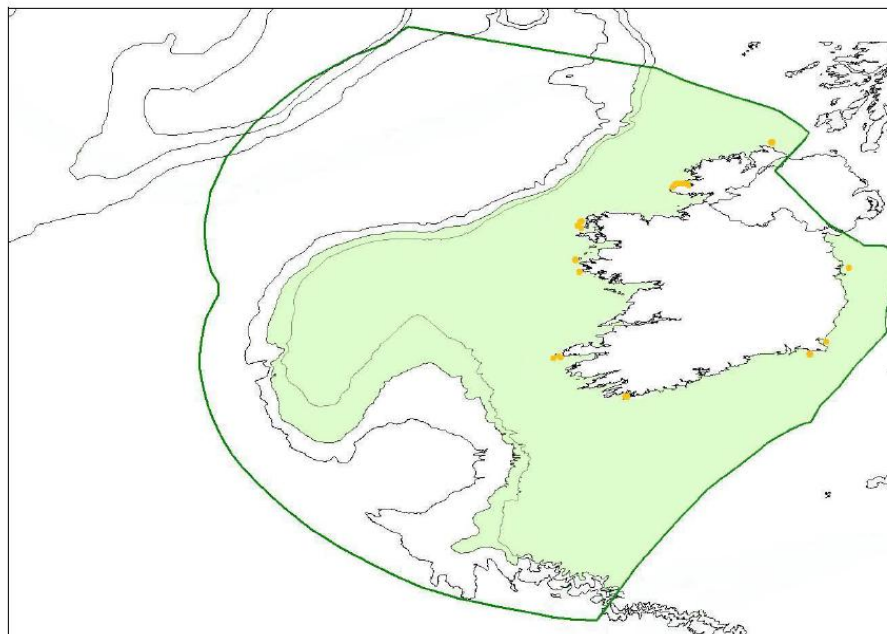
Figure 6.8 Generalised toothed whale and dolphin distribution in Irish waters (DAHG 2014)

GENERALISED DISTRIBUTION & HABITAT OF SEAL SPECIES IN IRISH WATERS



Generalised distribution range (shaded green) postulated for Harbour seal *Phoca vitulina* in the Irish EEZ based on background movement information and knowledge of coastal habitats occupied by the species. Key breeding and non-breeding haul-out locations in Ireland are marked red.

Figure 6.9 Generalised distribution and habitat of seal species in Irish waters (DAHG, 2014)



Generalised distribution range (shaded green) postulated for Grey seal *Halichoerus grypus* in the Irish EEZ based on background movement information and knowledge of coastal habitats occupied by the species. Key breeding and non-breeding haul-out locations in Ireland are marked orange.

Figure 6.10 Generalised distribution range and key breeding and non breeding haulout sites for grey seal in Ireland

The results from data accessed through the IWDG and the NBDC supports the maps presented in the NPWS guidance document.

6.4 Fair Seas Report 2022

The Fair Seas campaign is led by a coalition of Ireland's leading environmental non-governmental organisations and networks.

- BirdWatch Ireland
- Coastwatch
- Coomhola Salmon Trust
- Friends of the Irish Environment
- Irish Environmental Network
- Irish Whale and Dolphin Group
- Irish Wildlife Trust
- SWAN–Sustainable Water Network

The Irish government has supported the EU Biodiversity Strategy target to protect at least 30% of the Irish Maritime Area by 2030. However, current nature protection designations cover only 2.1% of the Irish Maritime Area (Fair Seas, 2022).

Commitments under the UN Sustainable Development Goals and the Convention on Biological Diversity, as well as several national and European legal obligations, require Ireland to protect and restore marine biodiversity (Fair Seas, 2022).

The Fair Seas report was published in June 2022. It presents 16 Areas of Interest for marine protected area (MPA) designation in Irish waters. The network of Areas of Interest for MPA designation covers just under 36% of Ireland's Maritime Area.

An Area of Interest is defined as a key biodiversity hotspot for one or more species of conservation interest. The area between Sligo and Donegal is one of these Areas of Interest (Fair Seas, 2022); the Port Pier project is within this area, see figure 6.11.

Five species groups were considered in the Fair Seas study: (1) cetaceans (marine mammals in the order Cetacea, e.g. whales and dolphins); (2) seabirds; (3) elasmobranchs (sharks, skates and rays and chimaeras); (4) commercially exploited species; and (5) seabed features (Fair Seas, 2022).

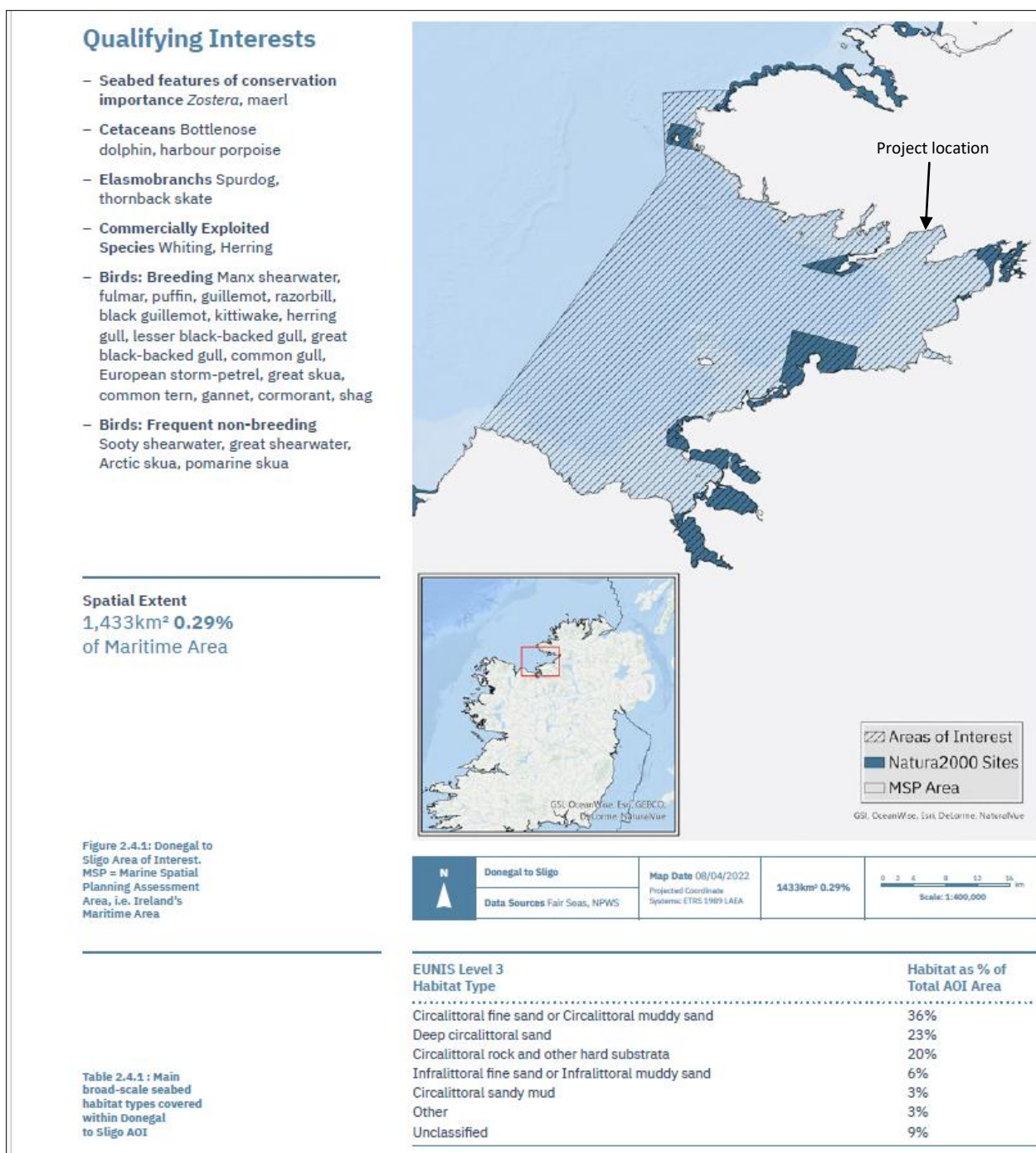


Figure 6.11 Extract from Fair Seas Report 2022, Area of Interest (AOI) Donegal to Sligo.

Bottlenose dolphins have been recorded regularly in Donegal Bay since 1994, when records began. They have been recorded in all months with a peak during the summer. This summer peak may represent observer effort and not the seasonal distribution of dolphins (Berrow et al, 2008). During 2008, the IWDG carried out three surveys of small cetaceans (mainly harbour porpoises and bottlenose dolphins) in the inner part of Donegal Bay on behalf of the NPWS (Berrow *et al.*, 2008). This involved carrying out boat-based line-transects each month

during July to September and estimating densities using distance analysis. Most sightings were in McSwynes Bay or on the south side of St John's Point (Berrow *et al*, 2008).

High densities of bottlenose dolphin occur in the Donegal to Sligo Area of Interest, which show a degree of site fidelity to Donegal Bay (Fair Seas, 2022). Six percent of all bottlenose dolphin sightings from 2005 to the present date across the analysed data within Ireland's EEZ occur within this site, accounting for 11% of the overall total number of individuals (n=41,888). Harbour porpoise are present year-round within this AOI (Fair Seas, 2022).

High densities (8.61/100km²) of bottlenose dolphin were recorded off St. Johns Point and Mullaghmore (6.57/100km²); the highest counts were from June to August (Fair Seas, 2022). A number of studies have identified Donegal Bay as having a high encounter rate with this species, and photo identification has shown the same individuals use the bay regularly. Nykänen *et al.* (2015) (as cited in Fair Seas, 2022) estimated that in 2014, 189 individuals used the waters between Connemara, Mullet Peninsula and Donegal Bay, with 23 individuals only seen in Donegal Bay. Nykänen *et al.* (2015) also stated that while calves were encountered on most occasions, six were observed in Donegal Bay: the highest number of calves recorded throughout the study. Inter-annual re-sightings indicate that a degree of site fidelity occurs in the west/northwest of Ireland (Fair Seas, 2022).

Although lower densities of harbor porpoise were recorded across the site (0.04 to 0.93/100km²), sightings occurred throughout the year. High densities (0.61/100km²) and concentrations of minke whales were recorded off St. John's Point, compared to lower densities throughout the site. The fair seas report also details the transient species sighted in the area: humpback whales (n=6), sporadic sightings of killer whales (n=5), risso's dolphins (n=4) and common dolphin sightings (n=38).

6.5 Summary of desktop data records of marine mammals

From the data sources accessed it is clear that there is significant marine mammal activity in the wider area around Port Pier, Inver Bay, St. John's Point, McSwyne's Bay and Donegal Bay.

The number of Otter sightings is low, with none in recent years. It is however likely Otter frequent the nearby Rivers, and may commute along the coastline.

Harbour seals are a qualifying interest of Donegal Bay (Murvagh) SAC. Harbour seal count data obtained in 2010 (143 individuals) from inner Donegal Bay continues to demonstrate the sites importance on both regional and national scales (NPWS, 2011). Harbour seals use a haul out site on the southern side of St. John's point. Grey seals also have a haul out site on the southern side of St. John's point though lower numbers were recorded, than harbour seals.

The most regularly occurring cetacean species occurring in the area is the bottlenose dolphin followed by the common dolphin, other dolphin of undetermined species, harbour porpoise and possible porpoise, minke whale, undetermined cetacean species, undetermined whale species, rissos dolphin, humpback whale, killer whale and fin whale.

Marine mammal sightings were located away from the area of the proposed works i.e. 2km+.

7.0 Environment: project location

The project location is in the intertidal zone and shallow waters of Inver Bay at the existing Port Pier, Inver. The works proposed are to extend the existing structure and dredge the approach to the pier to improve access. The dredge material will be used on site as much as possible, or will be removed to landfill. Dredge material has been sampled and analysed (Causeway Geotech, 2024). Sediments were found to be marine beach deposits: typically, silty, occasionally gravelly sands with sandy gravels closer to shore (Geotech, 2024). According to the Guidelines for the assessment of dredge material for disposal in Irish waters Sediments are classified as Class 1:- Contaminant concentrations less than level 1. Uncontaminated: no biological effects likely. They have been deemed suitable for dumping at sea which is a higher criteria than that for landfill.

There are no records of marine mammal sightings in the immediate vicinity of the project, with the closest sighting being 2km from the project location. This does not necessarily mean that marine mammals do not frequent Inver Bay, and it is likely that seals, harbour porpoise, minke whale and bottlenose dolphin may use the bay close to Port Pier. Otter may also frequent the area and are likely to be resident in the Eany River across the bay, and the Drumnakilly River to the west.

8.0 Marine Mammal Risk Assessment

As discussed in NPWS guidance an assessment of risk forms an important part of the decision-making framework for mitigating the effects of anthropogenic sound in the marine environment. Guidance recommends that all aforementioned coastal and marine activities undergo a risk assessment for anthropogenic sound-related impacts on relevant protected marine mammal species to address any area-specific sensitivities, both in timing and spatial extent

The risks of the project will be identified based on the available evidence, and the direct, indirect and cumulative effects of anthropogenic sound considered.

Of the activities proposed at Port Pier, Inver, pile driving/construction and dredging at the pier are the most likely activities to have an effect on marine mammals in the area.

The most likely species to be impacted are otter, harbour seal, grey seal, bottlenose dolphin, harbor porpoise and minke whale. These are the most commonly occurring species in the area, and they are also the most likely to come into shallower waters.

Direct effects

Direct effects to marine mammals in the project area are possible. A grab dredger or backhoe dredger is proposed for this project. This will be moored when operational and will work from a floating barge when the site is inundated.

A crane is used to lower a clamshell bucket or bucket into the water which scrapes the material off the sea bed. Once closed the bucket is brought to the surface and sediment deposited either directly into the new pier structure or onto a separate barge. Works will take place in very shallow coastal waters, while collisions are possible; they are unlikely due to the fact that the dredger will be moored and stationary.

Noise by grab dredgers varies substantially with stage (Todd *et al*, 2015). Dickerson *et al* (2001 as cited in Todd *et al* 2015) measures SPLs at 0.15km from a grab dredger throughout the entire process. The loudest SPLs of 124dB re 1µPa @ 1m were recorded at peak frequencies of 0.16kHz, when the bucket made impact with the sea floor.

The low Source Levels (SL) produced whilst dredging suggest physical injury to auditory systems of marine mammals is unlikely; more probable are masking and behavioural effects.

During dredging operations, there will be a localised increase in turbidity within c.50m of the excavator. This will generate a localised dredge plume in the immediate vicinity of the works. This is a temporary impact; once dredging is completed some of the material will settle out and be deposited on the sea bed and some will remain in suspension within the water column, before settling. Sedimentation and increases in turbidity are unlikely to affect marine mammals that use echolocation, but could potentially impact those that rely on sight.

With regard to piling, Robinson *et al* 2012 (as cited in Todd *et al*, 2015) took measurements around a 5m diameter pile in water 15-20m depth. Hydraulic hammers with typical strike energies of 1000kj were used, for which the majority of noise was <10kHz. Results estimated that the noise level at 0.1kHz was >60dB above background at 380m from the pile, reducing to <40dB above background at 5km. While this methodology differs from that being used at Port pier, which is of a smaller scale and in shallower waters using sheet piles, it demonstrates that if in close proximity to piling activity TTS and PTS is a potential threat to marine mammals.

Indirect effects

Indirect effects such as destruction of habitats, changes in prey abundance and distribution are unlikely due to the short duration of the project and the small scale of same and the wide availability of alternative habitat in the area. Existing data does not indicate that the project location is a key feeding, resting or breeding site.

Cumulative effects

Cumulative effects are not likely; Port Pier is a small rural pier which is used to serve local shellfish operators, fishers and recreational vessels. Boat traffic at the site is low intensity. Some vessels will move to other moorings while works are ongoing, due to space, and health and safety restrictions.

8.1 NPWS assessment criteria

Do individuals or populations of marine mammal species occur within the proposed area?

Yes, the number of Otter sightings is low, with none in recent years; however they are likely to commute around the area (no signs of Otter were noted on site visits).

Harbour Seals are a qualifying interest of Donegal Bay (Murvagh) SAC. Harbour seal count data obtained in 2010 (143 individuals) from inner Donegal Bay continues to demonstrate the sites importance on both regional and national scales (NPWS, 2011). Harbour seals use a haul out site on the southern side of St. John's point. Grey seals also have a haul out site on the southern side of St. John's point though lower numbers were recorded, than harbour seals.

From 2013 - 2022 the most regularly recorded cetacean species is bottlenose dolphin at 1,436 followed by 897 common dolphin, 678 dolphin of undetermined species, 190 harbour porpoise and 75 possible porpoise, 71 minke whale, 21 undetermined cetacean species, 8 undetermined whale species, 7 Risso's dolphin, 5 humpback whale, 2 killer whale and 2 Fin whale. 3,436 individuals were recorded in total.

Is the plan or project likely to result in death, injury or disturbance of individuals?

Death of a marine mammal is not likely.

If in close proximity to piling activity TTS and PTS is a potential threat to marine mammals, however the works will be done primarily in the dry at low water so opportunity for this to happen is reduced.

Avoidance and behavioral changes are possible. Given that piling noise is impulsive and loud, under suitable conditions, numerous marine mammal species can potentially be at risk from masking and pinnipeds could also be affected by noise in air.

The low Source Levels (SL) produced whilst dredging suggest physical injury to auditory systems of marine mammals is unlikely; more probable are masking and behavioural effects. Collisions are possible, but unlikely due to the fact that the dredger will be moored and stationary and in the dry for the most part.

Sedimentation and increases in turbidity are unlikely to affect marine mammals that use echolocation, but could potentially impact those that rely on sight. The amounts being dredged are small 3,500m³, the dredge plume is unlikely to be significant i.e. within c. 50m of the site, and the works can be done in the dry for the most part.

Works will be over c. 6 months.

Is it possible to estimate the number of individuals of each species that are likely to be affected?

Not possible to know how many individuals are present at any one time. Timing of works is unknown at present.

According to IWDG data, groups of bottlenose dolphin sightings within 20km of the project, over the past decade range from 1 – 50 individuals, common and other dolphins range from 1-110 individuals, harbor porpoise range from 1 – 10 individuals, minke whales range from 1 – 6 individuals. Other whale species were sighted individually over this time period.

Cetacean sightings were not recorded within 2km of the project.

Will individuals be disturbed at a sensitive location or sensitive time during their life cycle?

No sensitive locations are evident in the vicinity of the project.

The closest cetacean sighting occurred 2km from the project site.

Seal haul out sites are some 7km away.

Otter have not been recorded within the project area (no holts were noted within 200m).

It is very unlikely that marine mammals will be impacted during a sensitive time of their life cycle.

Are the impacts likely to focus on a particular section of the species' population, e.g., adults vs. juveniles, males vs. females?

No, from the data available there is no indication that Inver bay is of specific particular importance to any species population, at any particular stage of life.

Will the plan or project cause displacement from key functional areas, e.g., for breeding, foraging, resting or migration?

Based on the datasets available, it is extremely unlikely that the proposed works will cause displacement from key functional areas. Some temporary displacement from the general area is possible, however there is a lot of

alternative habitat in the area, works are in very shallow coastal waters, and are not near any holts or haul out sites.

How quickly is the affected population likely to recover once the plan or project has ceased?

During breaks in works and once works cease completely, it is reasonable to assume that all species will return to the area.

Displacement, if it occurs, will be short lived based on the duration of the proposed works.

9.0 Mitigation

NPWS 'Guidance to manage the risk to marine mammals from man-made sound sources in Irish waters – January 2014' (NPWS, 2014) recommended that stated mitigation procedures for dredging and piling are followed and monitored by a suitable qualified Marine Mammal Observer (MMO).

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 (as presented in Appendix 7; NPWS, 2014).

Dredging

A dedicated Marine Mammal Observer will conduct a 30 minute watch for marine mammals within 500m of the dredging vessel prior to start up. If a seal, cetacean, basking shark, turtle or otter is sighted within 100m of the vessel, start-up must be delayed until the animal is observed to move outside the mitigation zone or the 30 minutes has passed without the animal being sighted within the mitigation zone.

Pre-start monitoring

Dredging activities 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.

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 (see below). It shall only proceed on positive confirmation with the MMO.

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.

This prescribed Pre-Start Monitoring shall subsequently be followed immediately by normal dredging operations. The delay between the end of Pre-Start Monitoring and the necessary full dredging output must be minimised.

Dredging operations

Once normal dredging operations commence, there is no requirement to halt or discontinue the activity at night-time, nor if weather or visibility conditions deteriorate nor if marine mammals occur within a 500m radial distance of the sound source, i.e., within the Monitored Zone.

Breaks in sound output

If there is a break in dredging 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 must be undertaken in accordance with the above conditions prior to the recommencement of dredging activity.

Reporting

Full reporting on MMO operations and mitigation undertaken must be provided to the Regulatory Authority as outlined in Appendix 7 (NPWS, 2014).

Pile driving

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 (Appendix 7).
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, pile driving activity shall not commence if marine mammals are detected within a 1,000m radial distance of the pile driving sound source, i.e., within the Monitored Zone.

Pre-Start Monitoring

3. Pile driving activities 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 (see below). 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.

Ramp-Up Procedure

7. In commencing a pile driving operation 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. The procedure for use should be informed by the risk assessment undertaken giving due consideration to the pile specification, the driving mechanism, the receiving substrate, the duration of the activity, the receiving environment and species therein, and other information (see section 3 of DAHG, 2014).
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 effective Ramp-Up Procedure commences, there is no requirement to halt or discontinue the procedure at night-time, nor if weather or visibility conditions deteriorate nor if marine mammals occur within a 1,000m radial distance of the sound source, i.e., within the Monitored Zone.

Breaks in sound output

13. If there is a break in pile driving 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 pile driving operations which have the potential to produce injurious levels of underwater sound (see sections 2.4, 3.2 of DAHG, 2014) as informed by the associated risk assessment, there is likely to be a regulatory requirement to adopt a 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.

Reporting

15. Full reporting on MMO operations and mitigation undertaken must be provided to the Regulatory Authority as outlined in Appendix 7 of DAHG, 2014.

Other considerations

A Construction Method Statement has been prepared, and a suite of mitigation measures pertaining to the construction phase of the project is detailed in Section 7 of the NIS (including pollution and sediment controls).

10.0 Summary / Conclusion

The Port Pier Extension proposal is a small scale project of relatively short duration (c. 6 months). There is no ongoing dredging proposed, and the quantities of dredge materials are small 3,500m³. Works will take place in the dry for the most part, and dredge material will be used in the construction of the pier or removed to landfill. The project is not in close proximity to marine mammal breeding or haul out sites. There is however a large amount of marine mammal activity in the wider area around Inver Bay, St. John's Point, McSwynes Bay and Donegal Bay. Based on the number of sightings for the region and the type of works proposed (dredging and piling), in the absence of mitigation, it is possible that the project could cause direct effects to marine mammals in the area. It is recommended to adopt the NPWS guidelines. A MMO will carry out observations from land and monitor the area for marine mammals during loud construction activities including piling and dredging

operations and implement the NPWS guidelines. The proposed works with mitigation outlined are considered unlikely to present a risk to marine mammals.

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