

Appendix 8C

Marine Mammal Observers Report 2024



Drilling, Blasting and Dredging Works (26/06/2023 – 20/05/2024)
Marine Mammal Observer Report

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Executive Summary

Marine mammal observation works for drilling, blasting and dredging operations undertaken by Ward and Burke Construction Ltd. for the client, the Department of Agriculture, Food and the Marine (DAFM), at Ros an Mhíl Harbour, Co. Galway, Ireland, for the deep-water quay development occurred between 26 June 2023 and 20 May 2024.

One dedicated, JNCC-certified Marine Mammal Observer (MMO) was present for drilling, blasting and dredging (from excavators) operations respectively from 26 June 2023 to 20 May 2024. The MMO conducted 30-minute visual pre-work watches during daylight hours for marine mammals prior to the operations. The operations were conducted in accordance with the Department of Arts, Heritage and the Gaeltacht (DAHG) '*Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters*' (2014).

A total of 190 visual marine mammal sightings were recorded during the MMO watches. Harbour seal (*Phoca vitulina*) was the most recorded species with 132 sightings (70%) followed by unidentified seal with 39 sightings (20%). Grey seal (*Halichoerus grypus*) sightings were recorded 17 times (9%) and unidentified dolphin recorded 2 sightings (1%).

In total, there were 11 instances where mitigation actions (delay in operations) were required; 10 delays were related to marine mammals being present in the mitigation zone while the other delay was due to strong sun glare not being suitable for conducting a pre-watch. For each of the 10 instances where operations were delayed due to marine mammal being present in the mitigation zone, operations were allowed to commence once at least 30 minutes had elapsed with no marine mammals detected within the mitigation zone by the MMO.

The following incidents of non-compliance were recorded:

- There was partial non-compliance due to health and safety reasons, where MMO's had to be relocated to a secure area during each blast. As a result, there was a 3–15-minute window between the end of the pre-watch and the blast where restricted/no monitoring took place.
- Between 19/04/2024 and 23/04/2024, three incidents of dredging non-compliance were recorded with dredging operations commenced in the berm area before 30-minute MMO watch periods were completed.

1. Introduction

1.1 Project Overview

The Department of Agriculture, Food and the Marine (DAFM) commissioned a deep-water quay development at Ros an Mhíl Harbour, Co. Galway, Ireland.

As part of the project requirements a team of dedicated, experienced Marine Mammal Observers (MMOs) were engaged to conduct marine mammal mitigation activities during drilling, blasting and dredging operations for the project. All MMOs were JNCC certified.

MMO observations were conducted on site from land. The Department of Arts, Heritage and the Gaeltacht (DAHG) '*Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters*' (2014) was implemented throughout the survey which outlined industry best practice approach to mitigate against any possible disturbance to marine mammals.

This report describes the MMO effort, marine mammal observations, weather conditions, mitigation methods, operations and compliance with the DAHG 2014 guidance throughout the project.

1.2 Project Area

The site is located in the townland of Ros an Mhíl Fishery Harbour Centre (FHC) on the North-East shore of Cashla Bay near the village of Ros an Mhíl, which is situated 1km from the harbour. Ros an Mhíl FHC is in the Connemara area of County Galway. The development area is situated at Ross an Mhíl, Connemara, Co. Galway, Ireland (see Figure 1-1).

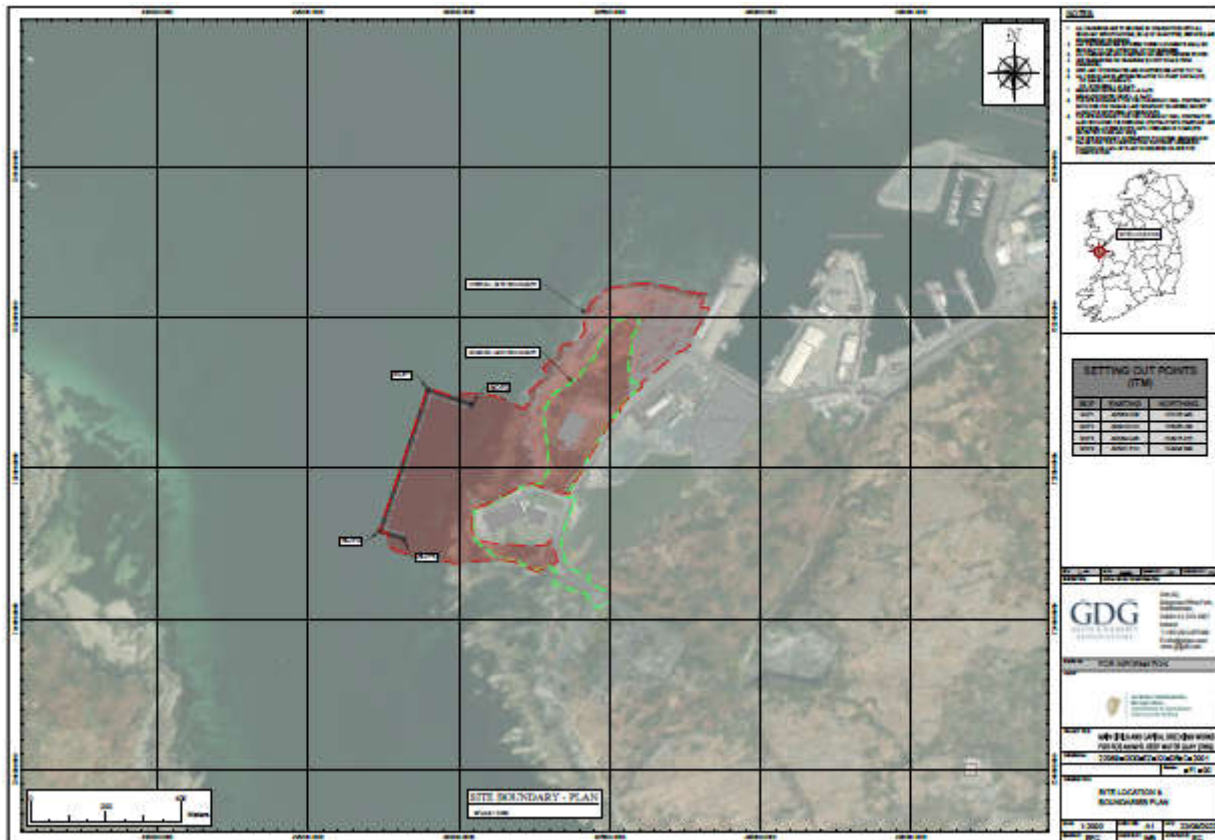


Figure 1-1 Ros an Mhíl Site Boundary Plan

According to the Ros an Mhíl Harbour Development Appropriate Assessment (Aquafact, 2017), the most likely species to be expected in Galway Bay is the harbour porpoise, while harbour seal are known to haul out in several locations within Cashla Bay.

2. Mitigation Methods

2.1 MMO Details

The Marine Mammal Observers (MMOs) responsible for overseeing the application of NPWS guidelines during the dredging, drilling and blasting activities were Catherine O'Sullivan, Hannah Keogh, John Power, and Maggie Starr. All of them are experienced MMOs in Irish waters and have been trained as marine mammal observers in accordance with JNCC standards.

2.2 Project Operations

The MMOs conducted 30-minute visual pre-work watches for marine mammals during the following drilling, blasting and dredging operations during the project.

2.2.1 Barge-based Drilling

Drilling was conducted from a drill rig on a barge. Drilling equipment specifications were as follows:

- DT145 Drilling unit: Hydraulic pressure 280 bar

2.2.2 Blasting

Explosives were used for blasting with varying numbers of explosives required per blast as the number of blast holes varied per location. The following specifications reflect one such blast which consisted of 108 holes at average depths of 17m:

- Explosives: Kemex 70, Detonators: U500 x 21.0m, SL 17ms x 7.8ms
- Boosters 250g: SL 25ms x 7.8m, SL 42ms x 7.8m
- Estimated Blast Tonnage: 30,983t
- Total explosive charge: 5,244kg

2.2.3 Barge and land-based Dredging

Hydraulic excavators were used for dredging which was conducted from land and also from a barge. Excavator specifications were as follows:

- Komatsu PC300LC: Bucket capacity 0.52-1.80 m³

2.3 Soft Start Procedure

As a soft start was not possible, no soft starts were conducted for operations.

2.4 Visual Observation

A dedicated, experienced, trained and JNCC certified MMO was present throughout the duration of the drilling, blasting and dredging operations described in this report. The operations were carried out in accordance with the DAHG '*Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters*' (2014).

Visual observations were conducted for 19 blasting operations, 11 dredging operations, and 14 drilling operations during the project. The MMOs conducted 55 watches, with 11 of these watches to check for marine mammals within the bunded area especially after high tide to ensure no marine mammals were within the bunds prior to dredging and drilling. Operations ran from 26 June 2023 to 20 May 2024, except during bunkering/resupply and during unexpected break downs.

Marine mammal mitigation for blasting works commenced on 26 June 2023. Marine mammal mitigation measures for the barge-based excavator, operating outside the bund, commenced on 07 February 2024. Marine mammal mitigation measures for the barge-based excavator, operating inside the open bund, commenced on 20 February 2024. Prior to 20 February 2024, no mitigation measures for the barge-based excavator, operating within the open bund, were applied due to communication issues/no MMO on site. Marine mammal mitigation for drilling operations commenced on 20 March 2024. Drilling took place both inside and outside the bund. Prior to 20 March 2024, no mitigation for drilling within the bund was applied due to communication issues/no MMO on site. Marine mammal mitigation for land-based excavators commenced on 24 April 2024. Prior to 24 April 2024, no mitigation measures for land-based excavators were applied as most land based excavator activity on site prior to 24 April 2024 was movement of imported stone bund which did not require marine mammal mitigation. Marine mammal mitigation measures for the barge-based excavator, operating inside the closed bund (with a shallow channel left in the wall for getting the barge in and out), commenced on 25 April 2024.

The role of the MMO was to conduct a 30-minute pre-watch before drilling, blasting and dredging operations commenced during daylight hours, in a WMO sea state 4 or less and in >1km visibility. The MMO's role was also to advise a delay in the commencement of the operations should any marine mammals be detected in the mitigation zone around the sound source during the pre-watch. In line with NPWS (2014) guidance it is stated for all three (3) activities, *"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."* The mitigation zone was 500m for drilling, 500m for dredging and 1,000m for blasting. The MMO also monitored for marine mammals during breaks in sound and during operations. In line with NPWS (2014) guidance, for dredging and drilling activities, if there is a break in drilling/dredging sound output for a period greater than 30 minutes then all Pre-Start Monitoring must be undertaken in accordance with the above conditions prior to the recommencement of drilling/dredging activity.

Observations were undertaken on site from the land (4m above sea level) with the naked eye and with Swarovski Optik EL 8.5x42 binoculars. MMOs were based at 53° 15.88 N, 9° 34.06 W (Observer Location A) and 53° 15.95 N, 9° 34.13 W (Observer Location B) to provide mitigation throughout the operational hours (see Figure 2-1 below). 55 watches were conducted.

Please note there was partial non-compliance with the DAHG *'Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters'* (2014) during blast observations due to health and safety reasons, where MMO's had to be relocated to a secure area during each blast. As a result, there was a 3–15-minute window between the end of the 30-minute pre-watch and the blast where restricted/no monitoring took place.

Ranges were determined by relating to an object at a known distance. Where possible in the event of sightings, photos were taken with a Canon EOS 100D DSLR camera with a 75-300mm lens to aid the identification of the species seen. The identification book *Whales, Dolphins, and Seals: A Field Guide to the Marine Mammals of the World* by Shirihai & Jarrett (2006) was also available to aid with identification if needed.

MMO effort and sightings data were recorded on the 'Effort' form and 'Sightings' form within the standard 2014 DAHG JIP22 MMO recording forms.

3. Results

3.1 Operations during observations

Over the course of the observations, drilling occurred on 14 occasions and accounted for 5 hours and 53 minutes of output, blasting occurred a total number of 19 times, and dredging operations occurred on 11 occasions and accounted for 41 hours and 52 minutes of output. Checks for marine mammals within the bunded area occurred 11 times and accounted for 9 hours and 03 minutes – see Figure 3-1 the percentage of time spent during the pre-watches for each activity.

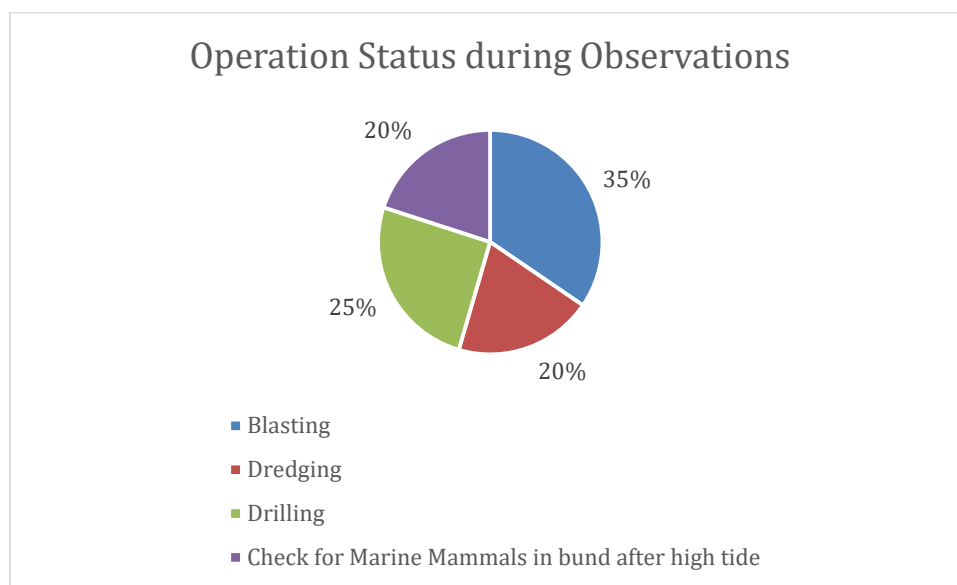


Figure 3-1 Duration of monitoring prior for each activity

3.2 Visual Observation Effort

The MMOs were based on land on site to provide mitigation throughout operational hours. A 30-minute pre-watch was carried out prior to drilling, blasting and dredging operations commencing.

In total, 142 hours and 13 minutes of visual monitoring effort was conducted over the course of the project. A total of 9 hours and 03 minutes of visual monitoring was performed prior to the commencement of drilling and dredging within the bunded area as a precautionary check for marine mammals after high tide, while 23 hours and 48 minutes of visual monitoring effort was conducted while the source (drilling/dredging) was active. Pre-watch monitoring for blasting activities accounted for 11 hours and 52 minutes.

Full details of monitoring effort data can be found in the 'Effort' form within the standard 2014 DAHG JIP22 MMO recording forms which accompany this document.

3.3 Marine Mammal Sightings

A total of 161 marine mammal sightings were recorded during MMO observations during this survey, accounting for a total of 190 individuals.

Harbour seal was the most recorded species with 132 sightings (70%) followed by unidentified seal with 39 sightings (20%). Grey seal sightings were recorded 17 times (9%) and unidentified dolphin recorded 2 sightings (1%).

Marine mammal sightings data is summarised in Table 3-1 below.

Table 3-1 Marine Mammal Sightings Summary during Observations across all watches

Species	Number of sightings	Number of individuals	Group Size range	Adults	Juveniles	Calves
Grey Seal (<i>Halichoerus grypus</i>)	16	17	1 to 2	17	0	0
Harbour Seal (<i>Phoca vitulina</i>)	106	132	1 to 3	132	0	0
Unidentified Seal	38	39	1 to 2	39	0	0
Unidentified Dolphin	1	2	2	2	0	0
Total	161	190				

Full details of sightings data can be found in the 'Sightings' form within the standard 2014 DAHG JIP22 MMO recording forms which accompany this document.

3.5 Mitigation Actions: Delays and Compliance

There was a total of 11 delays throughout the pre-watch surveys. There were 10 delays to operations as a result of marine mammals being detected within the mitigation zone during the pre-watch. There was one delay to operations as a result of unsuitable weather conditions including sun glare impairing the view for the MMO on watch. The delays are summarised as follows:

1. The pre-watch commenced at 14:00 UTC on 26/06/2023. At 14:06 UTC, one sighting of a harbour seal was observed within the mitigation zone, with another sighting recorded at 14:28 UTC. The blasting operation commenced at 15:05 UTC, resulting in a delay to operations of 28 minutes. Note, operations could have commenced from 14:58 UTC.
2. The pre-watch commenced at 13:45 UTC on 16/10/2023. At the start of the pre-watch, strong sun glare impaired the view of the MMO during the pre-watch, therefore an extra 15 minutes to the 30 minutes watch was required.
3. The pre-watch commenced at 15:16 UTC on 20/03/2024. At 15:26 UTC, one sighting of a harbour seal was observed within the mitigation zone. The drilling operations commenced at 15:56 UTC, resulting in a delay to operations of 10 minutes.

4. The pre-watch commenced at 12:01 UTC on 21/03/2024. At 12:21 UTC, one sighting of a harbour seal was observed within the mitigation zone. The blasting operation commenced at 12:51 UTC, resulting in a delay to operations of 20 minutes.
5. The pre-watch commenced at 11:10 UTC on 29/03/2024. At 11:35 UTC one sighting of a harbour seal was observed within the mitigation zone, with another sighting recorded at 12:21 UTC. The blasting operation commenced at 12:56 UTC, resulting in a delay to operations of 1 hour and 16 minutes.
6. The pre-watch commenced at 06:25 UTC on 19/04/2024. From 06:31 UTC to 07:32 UTC, three sightings were observed including two harbour seal sightings and one unidentified seal sighting within the mitigation zone. The final sighting was of a harbour seal, observed at 06:58 UTC, with the encounter concluding at 07:32 UTC. The dredging operations commenced at 07:30 UTC.
7. The pre-watch commenced at 10:02 UTC on 19/04/2024. One sighting of a harbour seal occurred at 10:00 UTC, with the encounter concluding at 10:22 UTC. The dredging operations commenced at 10:52 UTC, resulting in a delay to operations of 30 minutes.
8. The pre-watch commenced at 07:10 UTC on 22/04/2024. From 07:29 UTC to 08:09 UTC five sightings of harbour seals were observed within the mitigation zone. The dredging operations commenced at 08:17 UTC, resulting in a delay to operations of 37 minutes.
9. The pre-watch commenced at 07:00 UTC on 23/04/2024. From 07:10 UTC to 08:52 UTC, thirteen sightings of harbour seals and two sightings of grey seals were observed within the mitigation zone. The dredging operations commenced at 08:54 UTC, resulting in a delay to operations of 1 hour and 24 minutes.
10. The pre-watch commenced at 06:23 UTC on 24/04/2024. From 06:31 UTC to 06:43 UTC four sightings of harbour seals were observed within the mitigation zone. The dredging operations commenced at 07:13 UTC, resulting in a delay to operations of 20 minutes.
11. The pre-watch commenced at 06:41 UTC on 25/04/2024. From 06:43 UTC to 10:49 UTC, twenty-nine sightings of harbour seals, one sighting of grey seal and three sightings of unidentified seal were observed within the mitigation zone. The dredging operations commenced at 11:04 UTC, resulting in a delay to operations of 3 hours and 53 minutes. Dredging commenced as a result of closing the entrance to the bund to the water column and no marine mammals being present inside the bund during the MMO watch.

There was partial non-compliance due to health and safety reasons, where MMO's had to be relocated to a secure area during each blast. As a result, there was a 3–15-minute window between the end of the pre-watch and the blast where restricted/no monitoring took place.

There were three incidents of non-compliance, all between 19/04/2024 and 23/04/2024. Note once operations commence, the MMO is not required to shut them down.

1. 19/04/2024: Dredging from the barge (within the bund) commenced at 07:30 UTC while there was a harbour seal in the mitigation zone. The dredging operator got confused by seeing a land-based excavator operating in the water (also within the bund) and as a result thought that they could commence operations also.
2. 22/04/2024: 5 sightings of harbour seals and 1 sighting of an unidentified seal in the mitigation zone resulted in a delay of 37 minutes to commencing dredging from the barge (within the bund). Sightings of seals were observed between 07:29 UTC and 08:09 UTC and dredging

commenced at 08:17 UTC as the contractor decided they could wait no longer and as a land-based excavator was already operating in the water (also within the bund) prior to the barge commencing operations.

3. 23/04/2024: 13 sightings of harbour seals and 2 sightings of grey seal in the mitigation zone resulted in a delay of 1 hour and 24 minutes to commencing dredging from the barge (within the bund). Sightings of seals were observed between 07:10 UTC and 08:52 UTC and dredging commenced at 08:54 UTC as the contractor decided they could wait no longer and as a land-based excavator was already operating in the water (also within the bund) prior to the barge commencing operations.

Please note from 19/04/2024 and 23/04/2024 the berm area was almost fully enclosed with an open channel to allow the barge pass in and out. The dredging activity referenced was inside the berm area and marine mammal supervision was conducted prior to the start of works to ensure no seals were present within the berm area. It was the operative's understanding that dredging within the berm with seals outside of the berm area was not a non-compliance as the stone embankment made a barrier to noise. Underwater noise levels outside of the berm would be at much reduced levels compared to a scenario without the berm in place since the berm acts as a barrier to the noise propagation. The MMO watches for dredging over this time had a 500m mitigation zone as per the NPWS guidelines.

According to the DAHG 2014 Guidance, sound exposure levels from dredging operations are thought to be below that expected to cause injury to a marine mammal, though they have the potential to cause lower-level disturbance, masking or behavioural impacts. The likelihood of low-level disturbance to seals outside of the berm due to noise from dredging inside the berm is therefore very low, with sound exposure levels from these operations below that expected to cause injury to seals. However, these incidents are recorded as non-compliance as proceeding with operations with a seal within the 500 m mitigation zone, including waters outside of the berm, is contrary to the DAHG 2014 guidance, which states *"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, dredging activity shall not commence if marine mammals are detected within a 500m radial distance of the dredging sound source, i.e., within the Monitored Zone"*.

3.6 Weather Conditions

Weather conditions were recorded during the Marine Mammal Observer (MMO) watches, including Beaufort wind force, wind direction, sea state, swell height, visibility, and sun glare. Each of these factors can affect the observer's ability to detect marine mammals or may hinder accurate identification of the animals spotted. Figure 3-2 to Figure 3-6 below illustrate the recorded Beaufort sea state, swell, and visibility conditions.

The weather conditions described below account for conditions during the pre-monitoring watches. It does not include data for any periods where the MMO was not on watch.

Wind Direction

Sightings conditions during the project were generally good but periods of poor weather did occur. Winds recorded during observations were predominantly North-westerly, West or South-westerly (see Figure 3.1 below).

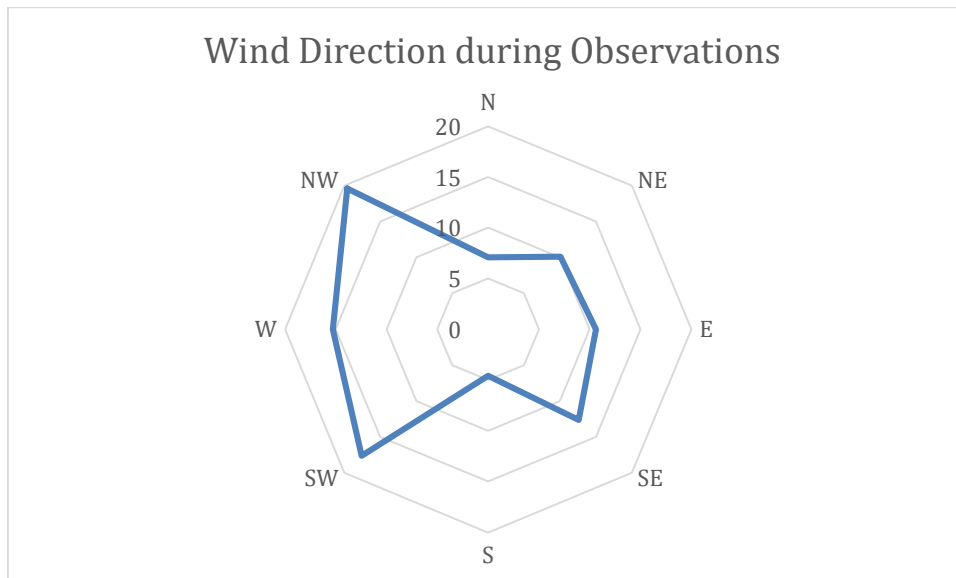


Figure 3-2 Summary of wind direction throughout observations

Wind Force (Beaufort force)

Wind forces (Beaufort force (BF)) 1-6 were recorded during the observation effort (Figure 3-3). The most frequently recorded wind force was BF4 at 35% of the time which was followed by BF3 35% of the time. BF3 was noted 17% of the time, followed by BF1 at 9%, BF5 3% of the time and BF6 at 1%.

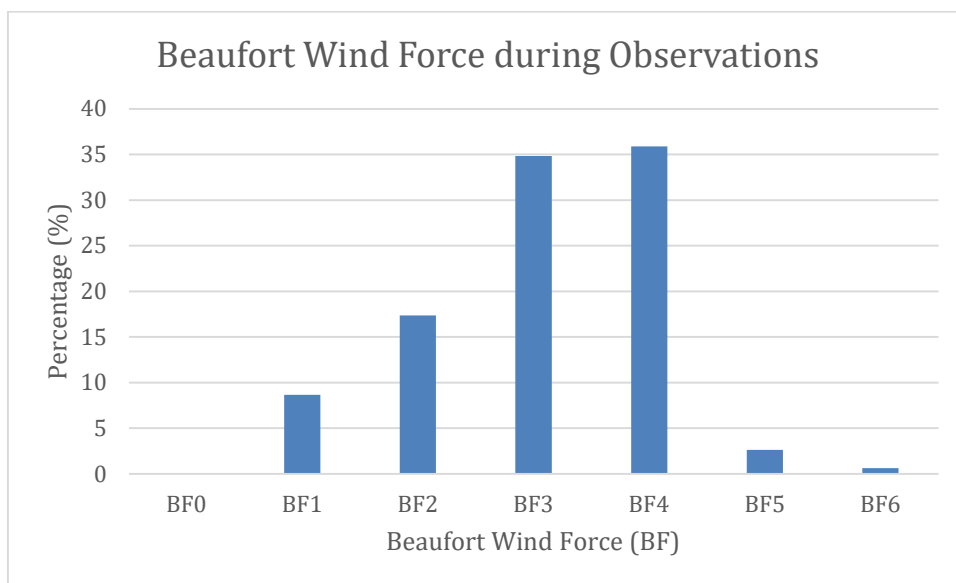


Figure 3-3 Summary of Beaufort Wind force during observations

Swell

The swell height for the majority of the observations was recorded as low (<2m) 100% of the time.

Visibility

The visibility was recorded as good (>5 km) for the majority of observations during the project (94%). Moderate visibility (1-5 km) accounted for 6% of observations (see Figure 3-4 below). High (10km) or poor (<1km) visibility was not observed/recorded during the observations.

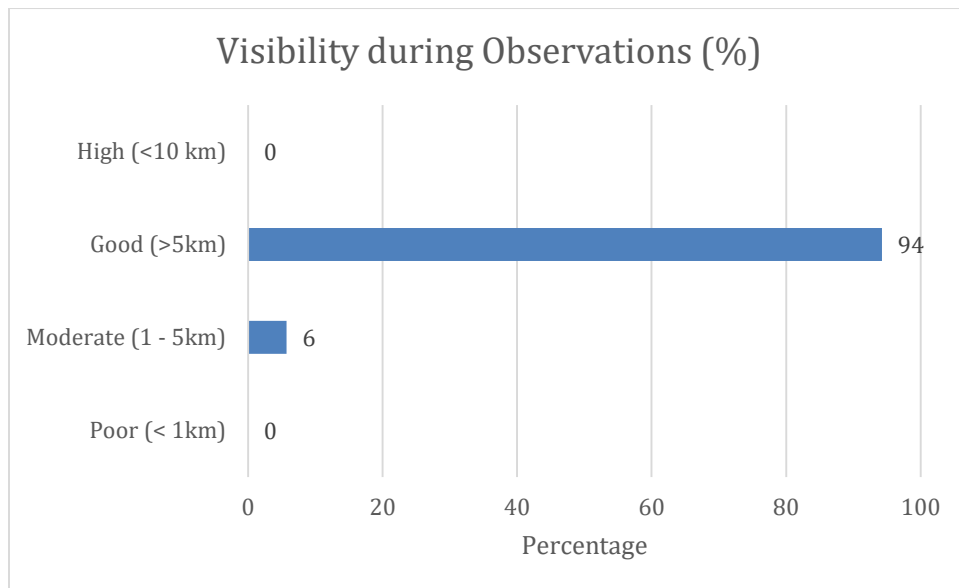


Figure 3-4 Summary of Beaufort Wind force during observations

Sun Glare

During the visual observations, sun glare was recorded to note the strength of glare (if any) as no glare, strong, weak or variable glare (see Figure 3-5). The highest level of glare recorded was strong 9% of the time. The glare most frequently recorded as no glare 62% of the time and followed by variable glare 22% of the time and weak glare 7% of the time.

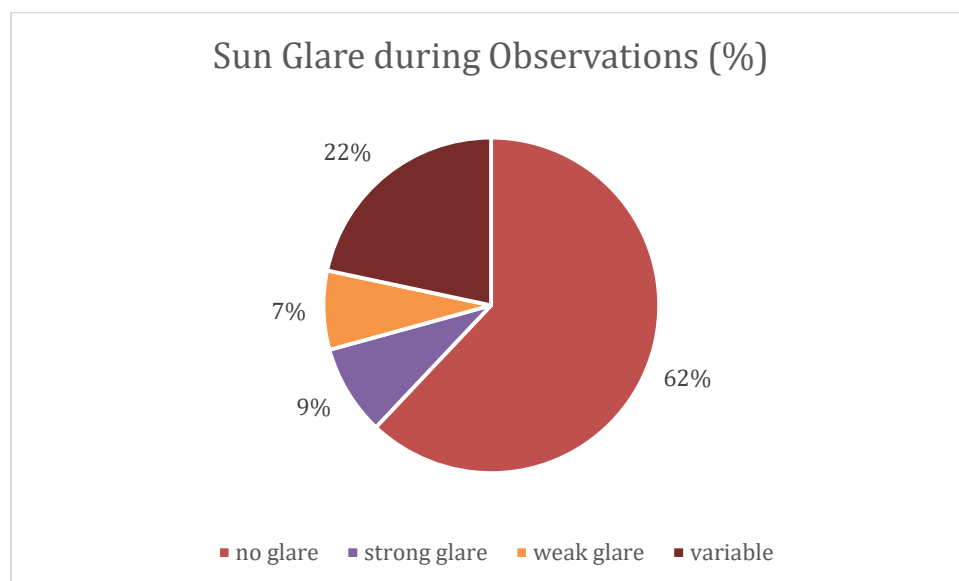


Figure 3-5 Sun glare during observations (no glare, strong glare, weak glare and variable)

Sea State

Sea state was recorded as slight (no or few white caps) 74% of the time, choppy (many white caps) for 16% of the observations and glassy (like a mirror) for 10% of the observations (Figure 3-6). Rough (large waves, foam crests and spray) were not recorded during any of the observations. The highest sea state recorded was choppy, while the majority of the sea states recorded were slight.

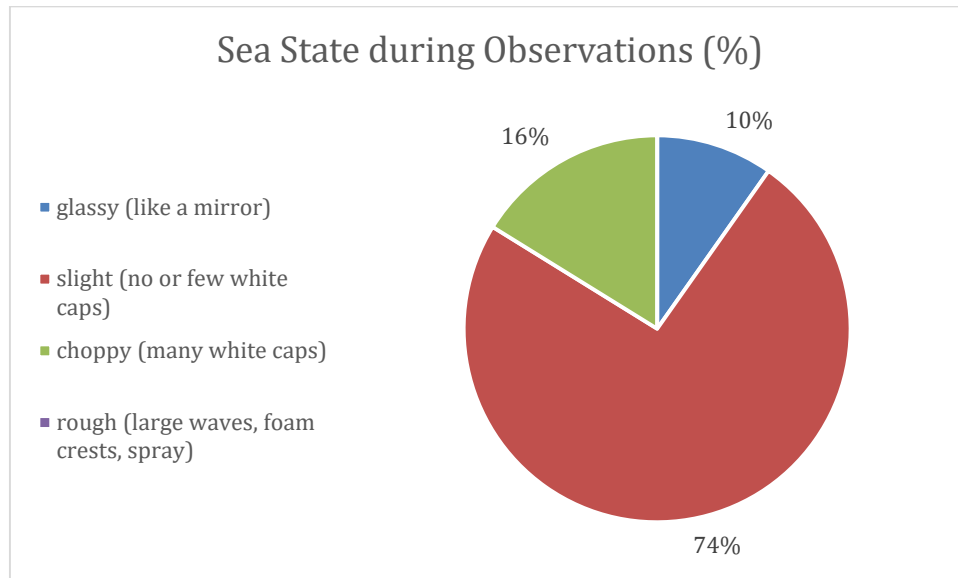


Figure 3-6 Summary of Sea States records during Observations

4. Discussion

The dedicated MMO's undertook visual watches in advance of, and where possible during, drilling, blasting and dredging works throughout daylight hours as required over the course of the project in accordance with the DAHG '*Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters*' (2014).

Visual pre-watches were conducted for 30 minutes by the MMOs. For Health and Safety reasons, during observations of blasting operations the MMO's had to be relocated to a secure area during each blast. As a result, there was a 3–15-minute window between the end of the pre-watch and the blast where restricted/no monitoring took place.

A total of 161 sightings of marine mammals were recorded throughout the project with harbour seals (*Phoca vitulina*) being the most frequently observed species.

There were 10 delays to operations as a result of marine mammals being detected within the mitigation zone during the pre-watch and one delay of 15 minutes to the start of blasting operations due to weather (sun glare) preventing the MMO from commencing their watch.

The following non-compliances were recorded:

- There was partial non-compliance due to health and safety reasons, where MMO's had to be relocated to a secure area during each blast. As a result, there was a 3-15 minute window between the end of the pre-watch and the blast where restricted/no monitoring took place.
- On the 19/04/2024, 22/04/2024, and 23/04/2024, three incidents of non-compliance were recorded with dredging operations commencing before the 30-minute MMO watch periods, required following marine mammals being observed in the mitigation zone during the pre-watch, were completed.

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