



Marine Mammal Observer Report

Project: Maintenance Dredging, Dublin Port

Marine Mammal Observers Report for Dredging and Dumping Activity

June-July 2016

Client: Dublin Port Company

Foreshore License: AKC/2016/00262

Dumping at Sea Permit: S0004-01

Ecological Consultants: IWDG

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Executive Summary

The Irish Whale and Dolphin Group (IWDG) were contracted by Dublin Port Company to provide experienced Marine Mammal Observer's for maintenance dredging and dumping operations in Dublin Bay, County Dublin. Dredging operations took place over 42 days from 20th June to 31st July 2016. Where possible an MMO carried out a minimum 30 minutes visual monitoring of a 500m exclusion zone for the presence of marine mammals before commencement of activities.

There were 134 sightings of marine mammals during the maintenance dredging campaign. Grey seal (*Halichoerus grypus*) was the most commonly recorded species with 76 sightings (57%) followed by harbour porpoise (*Phocoena phocoena*) with 56 sightings (42%). There was one sighting of a harbour seal (*Phoca vitulina*) and one sighting recorded as unidentified seal as species identification was not possible. Of the 134 sightings recorded, 61% were recorded during the watch prior to the commencement of dredging and dumping operations.

A total of three delays to operations were instigated by the observers, two of which related to marine mammals being present in the mitigation zone while the other was due to sea conditions not being suitable for conducting a pre-watch. In both of the delays due to marine mammal being present in the mitigation zone, operations were allowed to commence once the animal had left the mitigation zone.

There were 606 pre-watches carried out by MMO's during the project, with 54 instances of operations commencing in poor weather conditions (sea state >4) and the remaining 552 occurring in suitable conditions (sea state <4). Additionally, there were 249 instances of operations starting at night. It is generally recognized that the NPWS guidelines need to be reviewed in relation to dredging operations. The continuous nature of dredging activities requires operation during hours of darkness. Monitoring during night time operations using hydrophones can support mitigation measures.

In the opinion of IWDG Consulting, it is highly unlikely that the dredging and dumping activities had any significant impact on marine mammals in the area and at worst may have caused temporary displacement of some individuals.

Dredging Report

Date and location

Implementation of marine mammal mitigation measures took place on 42 days from 20th June to 31st July 2016 at Dublin Port in Dublin Bay, County Dublin to support a maintenance dredging campaign being carried out by Dublin Port Company. The dredging areas included numerous berths in the port downstream of Alexandra Basin West, and inner and outer navigation approach channels. The dump site was located at Burford bank approximately 5km South of Howth head. The dump site is approximately 12km from the western most dredge site and 4.5km for the eastern most dredge site. (See **Figure 1** below.)

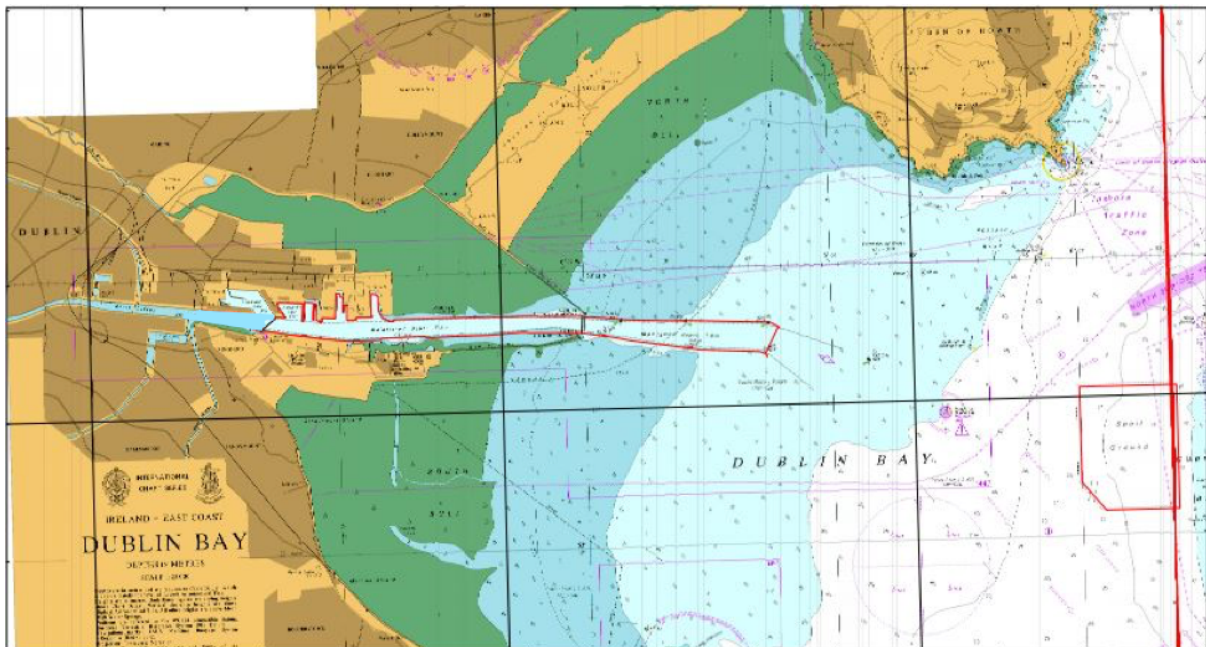


Figure 1. The areas to be dredged and spoil grounds for the maintenance dredge campaign (red boundary lines).

MMO details

The marine mammal observer's (MMO) who monitored the implementation of NPWS guidelines during the dredging and dumping were Paddy O'Dwyer, Enda McKeogh, Clodagh Russell, Loraine Grant and Stephanie Levesque who are all experienced JNCC trained marine mammal observers (See CV's in Appendix I). Paddy O'Dwyer and Enda McKeogh were

stationed on the dredge vessel throughout the campaign while the other MMOs used were stationed on land at the dredge site.

Other platform/vessel involved in the operation/activity

The Boskalis vessel *MV Freeway* was contracted for the dredging operations. It is a 92m trailing suction hopper dredger with a capacity of 4,500m³ (see **Figure 2** below). The *Freeway* can release its load in approximately 30-40 seconds followed by a further few minutes to wash out the holding tank and to fully close the doors.

The Freeway was supported by vessels operating ploughs and back hoes to distribute and access sediments for dredging. These operated continuously within the port area. A survey vessel also supported the dredging programme and operated throughout the area.



Figure 2. Trailing suction hopper dredger; *MV Freeway*

Co-ordinates for the areas of operations monitored by MMO

Table 1. Co-ordinates for areas of operation

| <u>North Quay Extension</u> | | | | <u>Ferry Port</u> | | | |
|-----------------------------|---|-----------|---|---------------------|---|-----------|---|
| 53'20.79' | N | 06'13.63' | W | 53'20.68' | N | 06'12.18' | W |
| 53'20.78' | N | 06'13.63' | W | 53'20.70' | N | 06'12.19' | W |
| 53'20.74' | N | 06'12.98' | W | 53'20.71' | N | 06'12.02' | W |
| 53'20.73' | N | 06'12.98' | W | 53'20.88' | N | 06'12.00' | W |
| <u>South Quays</u> | | | | 53'20.89' | N | 06'11.92' | W |
| 53'20.64' | N | 06'12.89' | W | 53'20.80' | N | 06'11.87' | W |
| 53'20.63' | N | 06'12.90' | W | 53'20.69' | N | 06'11.88' | W |
| 53'20.55' | N | 06'11.87' | W | 53'20.71' | N | 06'11.57' | W |
| 53'20.54' | N | 06'11.87' | W | 53'20.67' | N | 06'11.40' | W |
| <u>Oil Berths</u> | | | | 53'20.70' | N | 06'11.45' | W |
| 53'20.69' | N | 06'12.45' | W | 53'20.75' | N | 06'11.49' | W |
| 53'20.82' | N | 06'12.43' | W | 53'20.86' | N | 06'11.49' | W |
| 53'20.85' | N | 06'12.39' | W | 53'20.88' | N | 06'11.58' | W |
| 53'20.84' | N | 06'12.25' | W | <u>Dumping site</u> | | | |
| 53'20.80' | N | 06'12.23' | W | 53'20.07' | N | 06'03.00' | W |
| 53'20.69' | N | 06'12.24' | W | 53'20.07' | N | 06'01.82' | W |
| 53'20.68' | N | 06'12.18' | W | 53'19.17' | N | 06'01.82' | W |
| <u>Alexandra Basin East</u> | | | | 53'19.17' | N | 06'02.71' | W |
| 53'20.72' | N | 06'12.75' | W | 53'19.38' | N | 06'03.00' | W |
| 53'20.69' | N | 06'12.45' | W | <u>River Area B</u> | | | |
| 53'20.82' | N | 06'12.43' | W | 53'20.65' | N | 06'09.00' | W |
| 53'20.83' | N | 06'12.74' | W | 53'20.57' | N | 06'09.05' | W |
| 53'20.72' | N | 06'12.62' | W | 53'20.72' | N | 06'12.75' | W |
| 53'20.73' | N | 06'12.74' | W | 53'20.64' | N | 06'12.85' | W |

Observation platform

A total of three MMO's were required simultaneously to implement the mitigation guidelines for this project. Two MMO's conducted watches from the bridge of the source vessel which provided a viewing height of approximately 7.5 meters above sea level but varied somewhat depending on whether the hopper is full or empty. Land based observations were carried out from Coal pier (53° 12.10, -06° 05.35) in Dublin Port and provided excellent views into the various quays in the port (See **Figure 3** below) which were to be dredged.

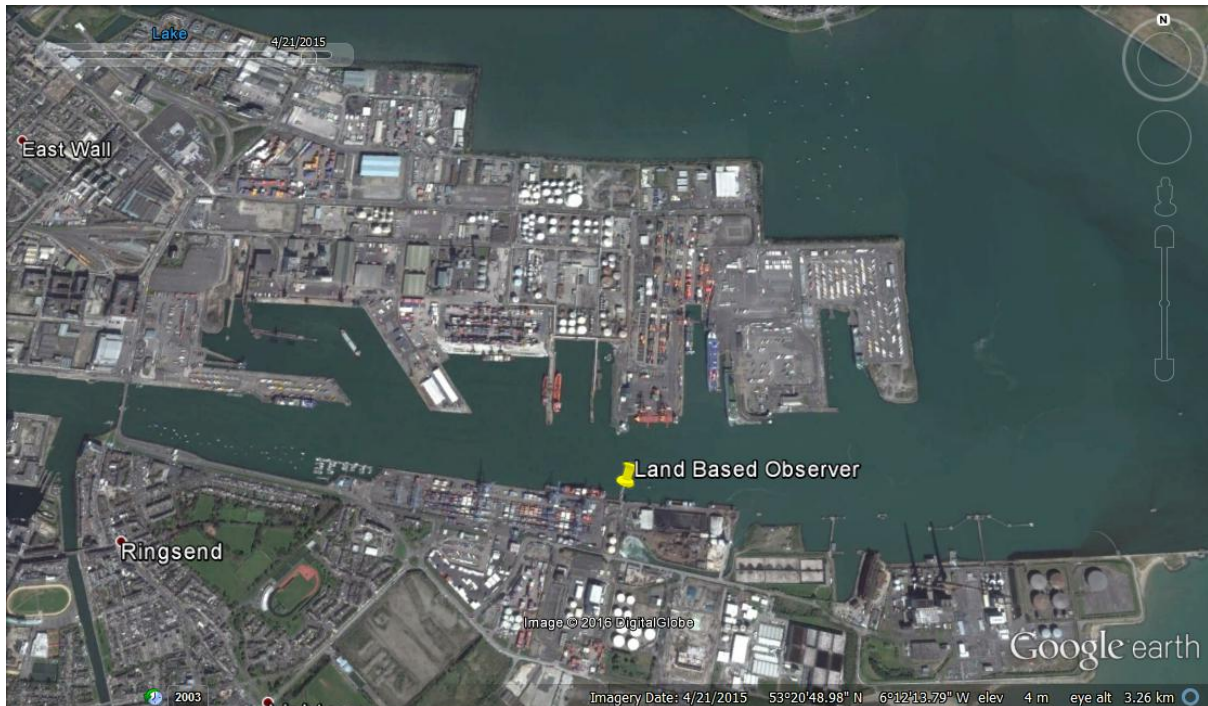


Figure 3. Location of land based observer (yellow pin).

The vessel based observers conducted watches from dawn to dusk while the land based observer conducted watches from 08:30 to 17:30. The land based observer conducted pre-watches for dredging in the harbour and inner channel areas only while the vessel based observers monitored these areas in addition to the other dredge sites not visible to the land based observer and spoil grounds. The vessel based observers conducted watches using 7*50 binoculars while the land based monitoring was conducted using an Opticron 30-70x telescope. All data was recorded onto data forms for coastal/marine works which were sourced from the National Parks and Wildlife Services' document; *"Guidance to Manage the Risk to Marine Mammals from Man Made Sound Sources in Irish Waters"* and later entered on an excel spreadsheet.

Pre-start watches were conducted during transit between the dredge and dump sites. This resulted in most of the pre-start watches for dumping being approximately 20 minutes long but reduced the duration of the project by over three days and so limited the exposure of marine mammals in the area to the operations. The presence of a third observer based on Coal pier in the harbour allowed for the majority of pre-watches in the harbour and inner channel to be >30 minutes' duration.

However, it should be noted, as described above, that the dredging operations were continuous in the sense that the dredger and support vessels operated continuously between dredging and dump sites. Any pauses in the campaign due to bunkering or repairs were preceded by 30 minute pre-start watches. It was decided that all transits of the dredger between dredge sites and dump area would be preceded by pre-start MMO watches in the interest of best practice. Underwater noise monitoring undertaken during this dredging campaign has confirmed that noise levels generated by dredging were below the disturbance levels for marine mammals and fish at 213m from source. It also confirmed that noise levels generated by dredge spoil dumping operations, although slightly above the response thresholds for harbour porpoise at 90m from source, are below the general behavioural threshold for harbour porpoise at this distance. It is clear therefore that the implementation of the 500m exclusion zone during this campaign is an effective mitigation measure to protect marine mammals.

Details of sound-producing operations

There was a total of 429 dredging operations and 429 dumping operations during the project. Operations ran 24 hours per day and 7 days a week except during bunkering/resupply and during unexpected break downs. Table 2 below provides a summary of operations but full details can be found in Appendix II.

Table 2. Summary of sound producing operations during the project

| Description | Number | Duration (hh:mm) |
|---------------------------|--------|------------------|
| Total operations | 858 | 486:37:00 |
| Total dumping activities | 429 | 60:18:00 |
| Total dredging activities | 429 | 426:19:00 |

Details of monitoring watches

A total of 780 hours and 34 minutes of monitoring effort was completed during the project. Of this, transiting between the dump and dredge sites accounted for 54%, dredging activities accounted for 40.6% and dumping activities accounted for 5.4% (see **Figure 4** below). A total of 606 pre-start monitoring watches were carried out (304 of these were prior to dredging

operations and 302 were prior to dumping operations). Full details of monitoring effort carried out during this project can be found in Appendix III.

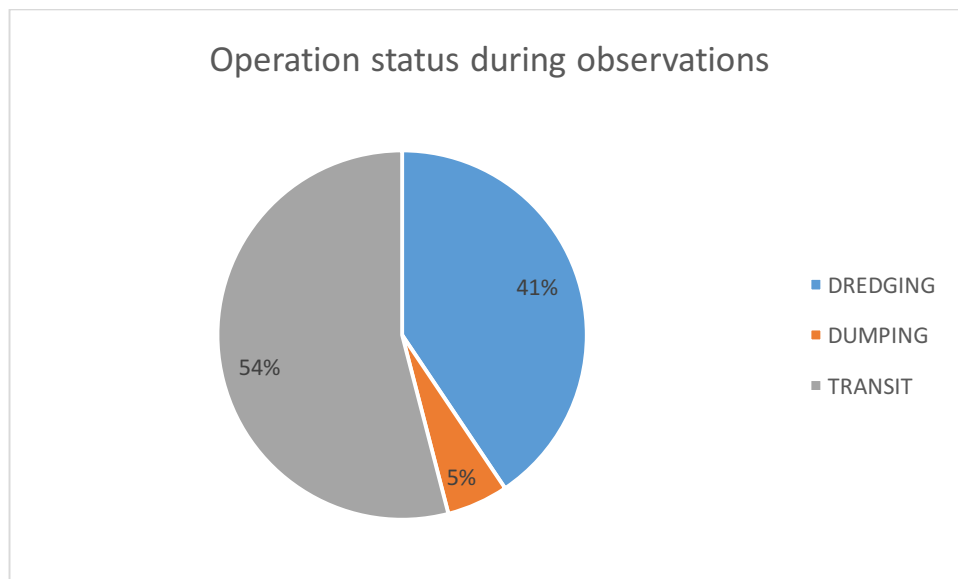


Figure 4. Percentage of monitoring effort conducted during the different operations status

Sightings conditions during the project were generally good but periods of poor weather did occur. Winds recorded during observations were predominantly West or South-westerly (see **Figure 5** below).

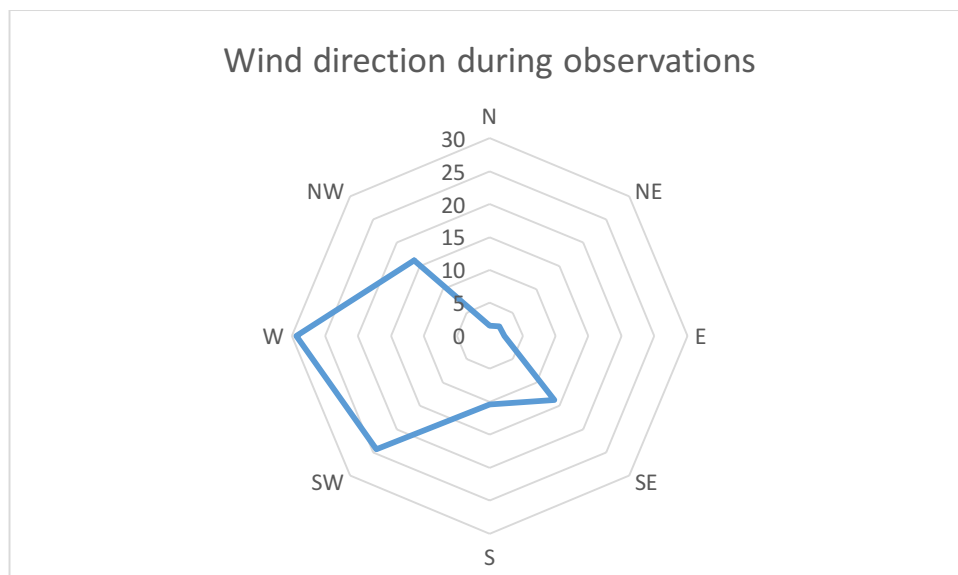


Figure 5. Summary of wind direction throughout observations

The visibility was high (>10 km) for the majority of observations during the project (96.5%). Good visibility (5-10 km) accounted for 1.8% of observations, moderate visibility (1-5 km) accounted for 1.3% and poor visibility (>1 km) accounted for 0.4% of observations. See **Figure 6** below.

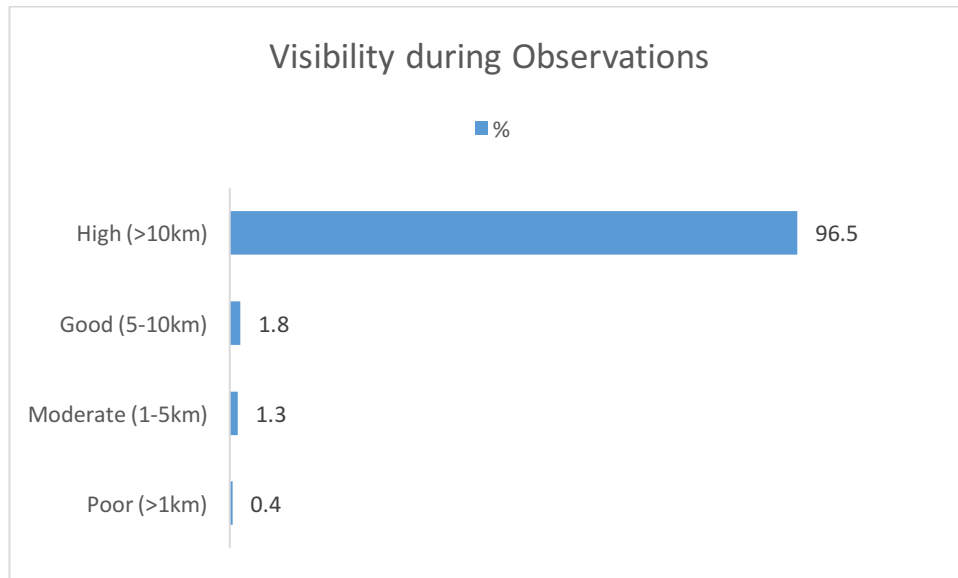


Figure 6. Summary of visibility during the project.

There was no swell for the majority of observations during the project (82% of observations) and low swell (0-1m) for 18% of observations. See **Figure 7** below.

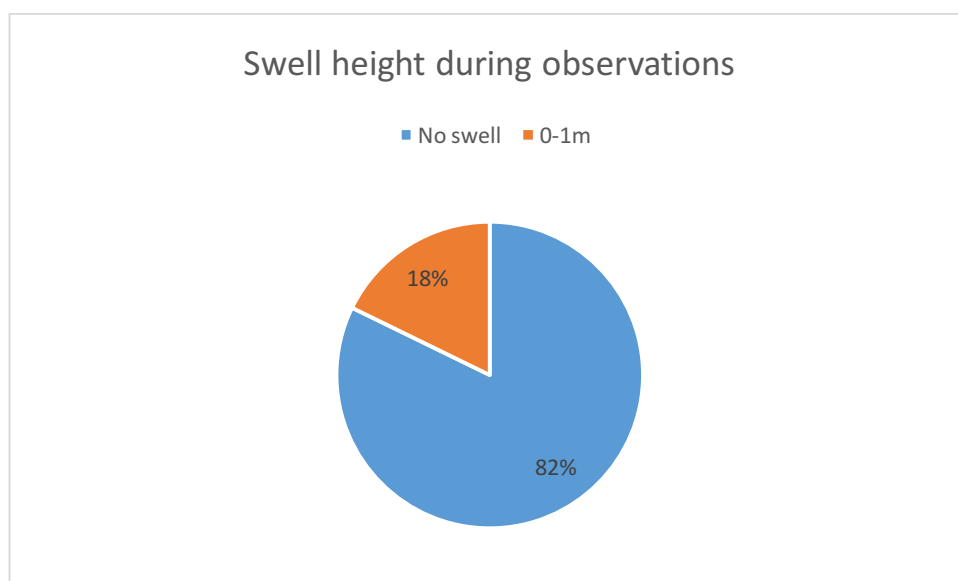


Figure 7. Summary of swell height during the project

Sea state was good for the majority of observations during the project. The vast majority of observations (91%) were carried out in a sea state <4 while 47% was carried out in sea state <2. The highest sea state recorded was sea state 6 and this accounted for 3% of observations. See **Figure 8** below.

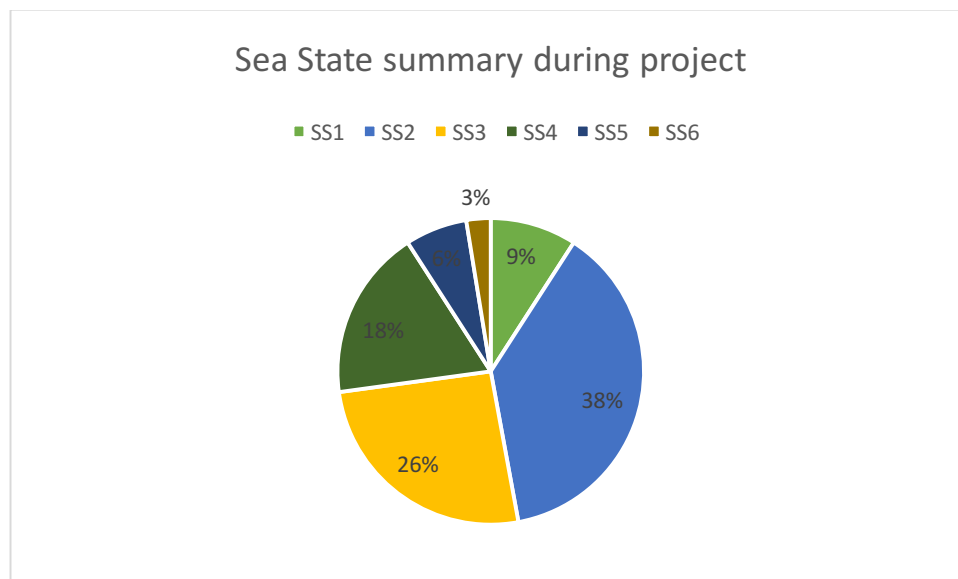


Figure 8. Summary of sea state during the project

Details of all marine mammal sightings recorded during monitoring watches.

There were 134 sightings of marine mammals on days where dredging and dumping activities took place. The animals were well distributed with sightings occurring at both dump and dredge sites as well as while transiting between these. The grey seal was the most commonly recorded species with 76 sightings (57%) followed by harbour porpoise with 56 sightings (42%). There was one sighting of a harbour seal and one sighting recorded as unidentified seal as species identification was not possible. The highest number of individuals recorded was harbour porpoise which accounted for approximately 54% of the total number of individual marine mammals sighted. Table 3 below is a summary of all sightings during the project but full sightings records can be found in Appendix IV.

Table 3: Summary of sightings recorded throughout the project

| Species | Number of sightings | Number of individuals | Group size | Adults | Juveniles | Calves |
|-------------------|---------------------|-----------------------|------------|--------|-----------|--------|
| Grey seal | 76 | 77 | 1-2 | 77 | 0 | 0 |
| Harbour porpoise | 56 | 93 | 1-5 | 74 | 1 | 18 |
| Common seal | 1 | 1 | 1 | 1 | 0 | 0 |
| Unidentified seal | 1 | 1 | 1 | 1 | 0 | 0 |

The majority of harbour porpoise sightings were well distributed throughout the operational area outside of the harbour while only three harbour porpoise sightings occurred inside the breakwater walls. Figure 9 below shows the distribution of harbour porpoise sightings during the project.

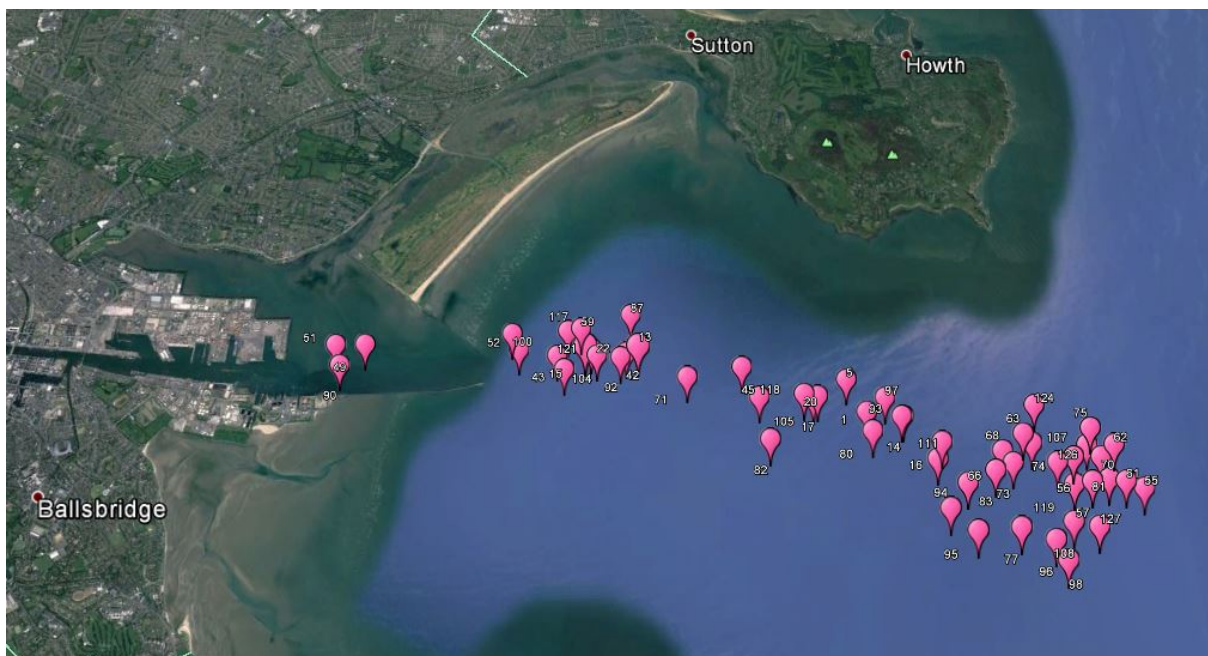


Figure 9. The distribution of harbour porpoise sightings during the project

The majority of seal sightings occurred inside the breakwater walls. All but two of the seal sightings recorded were of grey seals. It is likely that many of the seal sightings inside the breakwater are duplicate sightings of the same animal at different times. Figure 10 below shows the distribution of seal sightings during the project.

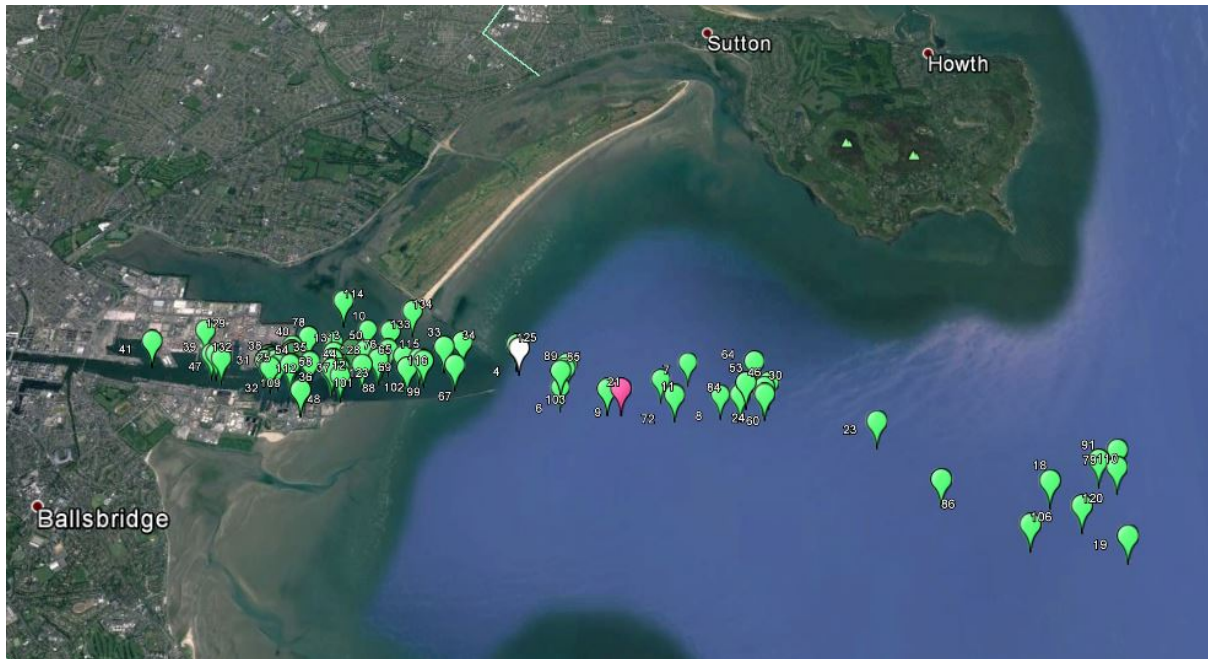


Figure 10. The distribution of seal sightings during the project. Green points represent grey seals, white point represents a common seal and the purple point represents unidentified seals.

Details of all marine mammal sightings recorded outside monitoring watches (e.g., incidental observations), including records from additional personnel on board.

There was one incidental report where a sighting (129) was recorded by a land based observer after they had completed their watch but remained in the area.

Table 4: Summary of incidental observations

| Species | Group size | Adults | Juveniles | Calves |
|-----------|------------|--------|-----------|--------|
| Grey seal | 1 | 1 | 0 | 0 |

Details of any problems encountered during marine mammal monitoring, start-up procedures, ramp-up (soft-start) procedures or during full scale operation/activity.

There were no problems encountered.

Conclusions

A pragmatic best practice approach was taken towards implementing the mitigation measures required for this project. Although dredging and associated activities were continuous during operation, watches were undertaken during dredger transit to and from the dump site. The transit time meant watches were generally of 20 minutes' duration. Compared to the recommended 30 minute pre-watch, this resulted in shortening the duration of the project and exposure of marine mammals by over three days (75hrs 37mins). By allowing operations to commence once an animal had left the mitigation zone instead of waiting a further 30 minutes, the potential for delays were reduced and overall disturbance to the animals minimised.

In the opinion of IWDG Consulting, it is highly unlikely that the dredging and dumping activities had a significant impact on marine mammals in the area and at worst may have caused temporary displacement of some individuals.