Marine Mammal Observer Report

Project: Maintenance Dredging of Approach Channel to Kilrush Marina

Multicat MV *Shannon 1*
PERMIT REGISTER NUMBER:

Client: Kilrush Marina
7-12 April 2024

IWDG Consulting

MMOs: Simon Berrow and Stephanie Levesque

Summary

A Marine Mammal Mitigation Plan was delivered during dredging operations as part of the maintenance to the channel leading into Kilrush Marina in County Clare. Dredging occurred from the 7-11 April 2024. One MMO carried out a minimum of 30 minutes pre-dredge monitoring of a 500m exclusion zone around the vessel from the entrance to the marina with a view of the entire area of operation. No cetaceans were observed within the mitigation zone during any 30 minute pre-watch period. One otter was seen in the mitigation zone on 9 April during a pre-watch, and onset of dredging was delayed by 5 minutes. Compliance with dredging at sea licence was achieved.

Introduction

The waters of Ireland's Exclusive Economic Zone (EEZ) represent one of the most important cetacean (whales, dolphins and porpoises) habitats in Europe. To date, 28 species of marine mammals have been recorded in Irish waters. Two species of seal; the grey seal (*Halichoerus grypus*) and the harbour seal (*Phoca vitulina*, also known as the common seal), the otter(*Lutra lutra*) and 25 species of cetaceans (see Appendix I). All cetacean species, seals and otters in Irish waters are protected by the 1976 Wildlife Act (and Wildlife Amendment Act 2000) and Irish waters, including the EEZ, were declared a Whale and Dolphin Sanctuary in 1991. All cetacean species and their habitats are protected under the EU Habitats Directive (Annex IV), while harbour porpoise and bottlenose dolphins are listed under Annex II requiring the designation of Special Areas of Conservation (SACs) for their protection.

Since January 2014, there exists a requirement for all dredging, drilling, pile driving, blasting, geophysical seismic surveys utilising airguns, water guns, sparkers, boomers, vertical sonar, sub -bottom profilers, vertical seismic profiling (VSP), check-out systems operations in Irish waters (EEZ), as well as multibeam, single beam, sub-scan profiler and side scan sonar surveys within bays, inlets, or estuaries or within 1000m to their entrance, to adhere to guidelines set forth in the *Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters,* issued by the National Parks and Wildlife Service (NPWS) of the Department of the Environment, Heritage and Local Government. These guidelines require that *'a qualified and experienced marine mammal observer (MMO) should be appointed to monitor for marine mammals and to log all relevant events using standardised data forms'*(NPWS 2014).

Kilrush Marina is within the Lower Rover Shannon SAC (Sie Code 002165) which includes bottlenose dolphins (*Tursiops truncatus*) and otter (*Lutra lutra*) as qualifying interests (NPWS 2012). A high level of mitigation for activities which may potentially cause disturbance to these Qis is important within an SAC.

From the 7-11 April 2024, the Irish Whale and Dolphin Group (IWDG) were contracted by Kilrush Marina to provide one MMO to assist in the maintenance dredging of the channel leading to the Kilrush Marina to oversee the implementation of the NPWS *Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters*.

Marine mammal observations were recorded by a dedicated MMO during this project. This work forms part of the IWDG's ongoing surveys into the distribution and abundance of cetacean species in Ireland's inshore marine habitats.

Dredging

The aim of this project was to maintain the approved water depths to the approaches of the Kilrush Marina via plough dredging. The dredge area is a 20m wide channel marked by buoys and extends eastwards from the lock gates toward Cappagh pier (see Figure 2). The activity consisted of the dumping by plough dredging of sands and silts arising from maintenance dredging to depths between 2.5m below Chart Datum (CD) and -4m CD at the approach channel to Kilrush Marina.

A.1 Quantity of Dredged Material to be Dumped at Sea

	Maximum annual rate of disposal (tonnes/wet weight per year)	Total maximum quantity (tonnes, wet weight)
Dredged material	5,000	35,000

NPWS (2014) has provided guidelines on mitigating the impact of sound sources on marine mammals, including dredging activity. Dredging is defined as "*the excavation of sand, gravel, loose rock and other material from the seabed*". Dredging is considered to include both the excavation and dumping of the material as the same operation. Once dredging has commenced, following the effective visual monitoring by a qualified MMO, "there is no need to halt operations at night time or if weather conditions deteriorate", unless there is a break in sound output of >30 minutes (NPWS 2014).

Vessel Multicat M.V. Shannon 1

SHANNON 1 (MMSI: 250001355) is a tug with a length overall (LOA) of 20 meters and her width is 8 meters, owned and operated by Shannon Foynes Port Company.

Survey Operational Area

Dredging Vessel: Multicat MV Shannon 1

Date: 7-11 April June 2024
Survey location: Approach channel to Kilrush Marina

Location of Dredging Zones:

i) 52°37.918N 9°30.294W
ii) 52°37.952N 9°30.152W
iii) 52°37.887N 9°30.130W
iv) 52°37.877N 9°30.173W
v) 52°37.614N 9°30.140W
vi) 52°37.609N 9°30.247W

Figure 2: Red indicates general area of dredge site, and MMO position during watches is shown at Cappa pier in yellow.

Plough Dredging

Plough dredging is routinely used in the Shannon Estuary as part of maintenance operations. Dredge operations emit continuous low frequency sound into the marine environment, and because of this sound signature, these type of works are generally considered of lesser concern for impacts on marine mammals. MV Shannon 1 is the frequently used for plough operations, and this technique of dredging gives rise to a lesser amount of re-suspension of sediment into the water column as the work is localised to the seabed. The Shannon Estuary is a very murky environment, and monitoring data from previous dredge campaigns since 2016 have showed plough dredging activities in other parts of the estuary have had no impact on turbidity.

Sound production from this operation will be largely influenced by sediment properties, and based on how hard or consolidated these mounds are, will determine how much force the dredger must apply to move the material (Robinson *et al*. 2011). These operations are most likely to occur within the frequency band 70-1000 Hz, peaking at 100-110 dB, with sounds

inaudible at approximately 500 m from the source (Clarke, 2002). The dredger itself is a source of continuous noise, reaching 100 to 115dB in the immediate vicinity of the dredger, but it is likely this noise diminishes to acceptable levels (50-70dB) a few hundred metres from the dredging site. These source levels (SL) at frequencies below 500 Hz are similar with those expected from a cargo ship travelling at a speed of between 8 and 16 knots (Arveson and Vendittis, 2000).

Methods

NPWS Guidelines relevant to this project

1. A qualified and experienced marine mammal observer (MMO) should be appointed to monitor for marine mammals and to log all relevant events using standardised data forms (Appendix 6).
2. The MMO must advise the Works Superintendent within a previously agreed timeframe prior to scheduled activity if environmental conditions (e.g., sea state, light, visibility) are insufficient for effective visual monitoring. In such conditions, the activity of concern should be postponed until acceptable conditions prevail.
3. In the event of suitable environmental conditions, a clear on-site communication signal must be agreed 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 should only proceed on positive confirmation with the MMO, which must be recorded by the MMO.
4. In waters up to 200m deep, the MMO should conduct pre-start-up constant effort monitoring at least 30 minutes before the sound-producing activity is due to commence, continuing monitoring during and for 30 minutes following the activity. Sound-producing activity should not commence until at least 30 minutes have elapsed with no marine mammal detections by the on-site MMO.
5. Where operations occur in waters >200m depth, pre-start-up monitoring should be conducted at least 60 minutes before the activity is due to commence, with monitoring continuing during and for 60 minutes following the activity. Sound-producing activity should not commence until at least 60 minutes have elapsed with no marine mammal detections by the on-site MMO.
6. Unless information specific to the location is otherwise available to inform the mitigation process (e.g., sound attenuation data), operations should not commence if marine mammals are detected within a 500m radial distance of the intended sound source, i.e., within the Monitored Zone.
7. Once begun, the activity may continue if weather conditions deteriorate or if marine mammals enter the 500m-radius Monitored Zone following start-up.
8. If there is a break in dredging or drilling activity for a period greater than 30 minutes then all pre-activity monitoring measures should recommence as for start-up.
9. Full reporting on MMO operations and mitigation undertaken should be provided to the Department of Arts, Heritage and the Gaeltacht to facilitate reporting under Article 17 of the EC Habitats Directive and future improvements to guidance. Details are given in Appendix 6.

Results

Marine Mammal Observations

Visual observations commenced on the 7 April (pm) and continued until the 11 April (am). All observations were carried out from Cappa(see Figure 2). Cell phones were used to keep in contact with the dredging crew. The MMO was in constant contact with the crew in order to be informed of when dredging would begin so the MMO could arrive 30 minutes before the start of operations in order to do a pre-watch for marine mammals.

All operations commenced once a pre-scan of 30 minutes deemed the 500m exclusion zone clear of marine mammals. The observer scanned the area by eye and using 7 X 50 binoculars. Distances were estimated with the aid of reticle binoculars (distance (m) = (height of eye above sea level (m) x 1000/ no. of mils down from horizon). Environmental data were recorded at the beginning and end of each watch, including sea state using the Beaufort scale, and wind direction/speed using WindGuru. All relevant forms were completed at the end of each working day as well as a detailed log of operations.

Overall, conditions were suitable for spotting marine mammals due to the sheltered location of the dredge site. The resident bottlenose dolphins rarely pass to the north of Scattery and Hog Islands, east of where the dredging was taking place.

Marine Mammal Sightings:

Marine mammal sightings are recorded in the MMO Cetacean Sighting Record form section (Appendix V). Only one marine mammal was recorded over the duration of the project.

Table 3: Marine mammal sightings

Sighting No.	Date	Species	Time (UTC)	Operation/Activity underway	Time activity began (UTC)	Distance (m)	No. of individuals
1	09/04/2024	Otter	17.30	None	-	200	1

Conclusion

Compliance with Guidelines for the Protection of Marine Mammals in Irish Waters

Dredging operations over the duration of the project were in compliance with the NPWS Guidelines for the protection of Marine Mammals during dredging operations in Irish Waters. One MMO was present throughout the dredging process to ensure there were no marine mammals within 500m of dredge site. One otter was seen while operations were not underway. No cetaceans were observed during the 30 minute pre-watches.

As the area of operation is infrequently used by cetaceans and the dredging activity was frequent and short in duration, the risk of injury or mortality to marine mammals during dredging was extremely unlikely. Dredging occurred on the ebb tides, one session in the morning and one in the evening, with each dredge lasting no more than 2.5 hours.
The only marine mammal seen in the dredge site was an otter, and these animals are exposed to vessels in and around the marina on a daily basis and would be aware of their presence. The

dredge vessel was slow moving and not able to turn quickly, thus, any animals in the area would have sufficient time to avoid any collisions.

It was decided in the marine mammal risk assessment that the noise levels associated with dredging, disposal, and vessel movements would not cause permanent injury to the animals. They concluded that the activity of the dredger could cause temporary displacement from the immediate area, although extremely unlikely, and if it did occur would only be short-term.

References

Arveson, P. T., and Vendittis, D. J. (2000) Radiated noise characteristics of a modern cargo ship, Journal of the Acoustical Society of America 107, 118–129.

Berrow, S.D., Holmes, B. and Kiely, O. (1996). Distribution and abundance of bottle-nosed dolphins *Tursiops truncatus* (Montagu) in the Shannon Estuary, Ireland. Biology and Environment: Proceedings of the Royal Irish Academy 96B (1), 1–9.

Berrow, S.D. (2009) Winter distribution of Bottle-nosed Dolphins (*Tursiops truncatus* (Montagu))in the inner Shannon Estuary. Irish Naturalists' Journal *30(1),* 35-39.

Clarke, D., Dickerson, C., and K. Reine (2002) Characterization of underwater sounds produced by dredges. Dredging 2002, ASCE, Orlando, Florida, USA, p 64-81.

NPWS(2012)Lower River Shannon SAC (site code: 2165)Conservation objectives supporting document marine habitats and species. Version 1March 2012.
NPWS (2014). Guidance to minimise the risk to marine mammals from man-made sound sources in Irish waters. Guidance Document by the National Parks and Wildlife Service of the Department of Arts, Heritage and Gaeltacht, Dublin.

Robinson, S.P., Theobald, P.D., Hayman, G., Wang, L. S., Lepper, P. A., Humphrey, V. and Mumford, S. (2011) Measurement of noise arising from marine aggregate dredging operations, MALSF (MEPF Ref no. 09/P108).

Appendices

Appendix I: CETACEAN SPECIES IN IRISH WATERS

Appendix II: MMO CV (Simon Berrow and Stephanie Levesque)

Appendix III: MARINE MAMMAL RECORDING FORM – RECORD OF OPERATIONS

Appendix IV: MARINE MAMMAL RECORDING FORM – MMO EFFORT

Appendix V: MMO CETACEAN SIGHTING RECORDS

Appendix I: Cetacean Species in Irish Waters

Atlantic White-Sided Dolphin *Lagenorhynchus acutus*
Beluga *Delphinapterus leucas*
Blue Whale *Balaenoptera musculus*
Bottlenose Dolphin *Tursiops truncatus*
Common Dolphin *Delphinus delphis*
Cuvier's Beaked Whale *Ziphius cavirostris*
False Killer Whale *Pseudorca crassidens*
Fin Whale *Balaenoptera physalus*
Gervais' Beaked Whale *Mesoplodon europaeus*
Harbour Porpoise*Phocoenaphocoena*
Humpback Whale *Megaptera novaeangliae*
Killer Whale *Orcinus orca*
Minke Whale *Balaenoptera acutorostrata*
Northern Bottlenose Whale *Hyperoodon ampullatus*
Northern Right Whale *Eubalaena glacialis*
Pilot Whale (long-finned) *Globicephala melas*
Pygmy Sperm Whale *Kogia breviceps*
Risso's Dolphin *Grampus griseus*
Sei Whale *Balaenoptera borealis*
Sowerby's Beaked Whale *Mesoplodon bidens*
Sperm Whale *Physeter macrocephalus*
Striped Dolphin *Stenella coeruleoalba*
True's Beaked Whale *Mesoplodon mirus*
White-Beaked Dolphin *Lagenorhynchus albirostris*

Appendix II: Marine Mammal Observers CV

Simon David Berrow BSc. PhD.

Einagh,	Tel:	00353 65 - 9080500
Moyasta	Mobile:	00353 86 - 8545450
Kilrush,	Email:	simondberrow@gmail.com
Co. Clare	Website:	www.iwdg.ie

1990-present

Chief Executive Officer of the ***Irish Whale and Dolphin Group (IWDG),*** an NGO dedicated to the study and conservation of cetaceans in Ireland. The IWDG have been co-ordinating an All-Ireland stranding and sighting scheme since 1991. I am presently responsible for the delivery of the IWDG 5-year plan and reporting to the board. I also deliver training courses on cetacean identification and recording and am co-ordinating the development of the databases and on-line access. I manage IWDG Consulting (see http://consulting.iwdg.ie) on behalf of IWDG which was launched in 2015 to formalise consultancy services.

2009 – present

Lecturer at the **Atlantic Technological University** (formerly ***Galway-Mayo Institute of Technology***) contributing to the Applied Freshwater and Marine Honours Degree. Delivering modules in Aquaculture and Fisheries, Botany and Zoology and Environmental Legislation. Contributing to the International Masters in Research and Conservation (IMBRSea) and ATU Masters programmes including Marine Mammal Survey Techniques, Marine Governance, Ecology of Top Predators and Stakeholder Engagement. Supervision of undergraduates and post-graduates and research projects. Active member of the Marine and Freshwater Research Centre (https://www.facebook.com/MFRCGMIT). Recently delivered a contract worth €1 million to the DECNR for ObSERVE-Acoustic contract (2015-2018). Supervised 6 PhD and 9 MSc students to completion. Currently supervising 3 PhD students.

2000 - 2017

Project Manager for the ***Shannon Dolphin and Wildlife Foundation (SDWF),*** which was a registered charity established to "*develop and provide educational awareness and conservation of the bottlenose dolphins in the Shannon estuary and other wildlife in the region*". The SDWF carried out dolphin research and monitoring in the Shannon estuary which included monitoring to determine the movements and behaviour of the dolphins and monitoring of the dolphin-watching tour boats and the impacts of industrial activities. SDWF was taken over by the IWDG (above) in 2017.

1995 – 1999

Vertebrate ecologist in the Higher Predators Section of Marine Life Sciences Division of the **British Antarctic Survey** including 2 years fieldwork at Bird Island, South Georgia. Worked on a number of projects on seabirds (penguins, wandering albatrosses, white-chinned petrels) and Antarctic fur seals and was responsible for implementation and review of the Bird Island Monitoring Programme which monitors the breeding and feeding ecology of a wide range of species and is the longest running data set in the Antarctic region.

1991 – 1995

Postdoctoral research fellow in the Department of Zoology, **University College, Cork** carrying out research on cetaceans, sharks and seabirds in Irish waters, including: health status of small cetaceans in collaboration with research institutions abroad and involved post-mortem examination of dolphins and porpoise. Senior partner in collaborative studies of the interaction between marine mammals and fisheries. Initiated a study of the bottlenose dolphins *Tursiops truncatus* in the Shannon estuary to determine distribution and abundance. Research on sharks included establishing a sighting scheme for monitoring basking sharks in Irish waters and the study of fisheries interactions.

1987 – 1991 **PhD** awarded by the NUI, University College, Cork, Department of Zoology.
1983 – 1987 **BSc (Hons)** in Applied Biology at Liverpool Polytechnic

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Positions Held and Qualifications

Clare Heritage and Biodiversity Forum (2023 – present)
and Editorial Board of ZOOLOGIA CABOVERDIANA (2017 – present)
Member of National Biodiversity Forum (2016-present)
ICES Working Group on Marine Mammal Ecology (2015-present)
Celtic Sea Herring Management Advisory Committee (2011 – 2021)
Member of Offshore Renewable Energy Steering Group (2014-2017)
First presentation (2012 - on basking sharks) in Ireland to be uploaded to www.TED.com (>550,000 views)
Clare LEADER Evaluation Committee – Environment (2010 - 2013)
Council member of the European Cetacean Society (2008-2012)
Board of Management of the National Biodiversity Data Centre (2006 - 2011)
Passive Acoustic Monitoring Course: December 2009
Marine Mammal Observer Course: July 2007
Editorial Board of Journal "Tourism in Marine Environments"
Chair of County Clare Biodiversity Group (2003- 2008)
Technical Advisory Committee of the GSI Seabed Survey (2001 – 2005)
Heritage Council of Ireland (2000 – 2005)
ICES Study Group on Seals and Small Cetaceans and Elasmobranchs (1993 - 1995)
Director of Friends of the Earth (Ireland) (1989 - 1991)
CMAS*** Sub-Aqua Diver and Boat Handler with 25 years diving experience
Commercial endorsement for passenger licence vessel
Short range VHF licence Royal Yachting Association Offshore Full driving license

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Media Outreach

2023: feature on RTE **Summer Show** on Basking Sharks
2022: feature on RTE **Summer Show** on the Shannon Dolphins
2018: **TEDx Ballybofey** "*Where do Humpbacks whales in Ireland come from* ?" May 2018
2018: Mooney: regular contributor to new live weekly broadcast of **Mooney Goes Wild** on RTE
2017: Monthly feature on **Maritime Ireland** digital radio and in the **Marine Times** with Tom McSweeney
2017: **Eco-Eye**: featured in a programme on ocean noise
2017: **RTE Radio 1:** Special on marine debris in cetaceans. Derek Mooney
2015: **Humpback whales in Cape Verde**, TG4 and Library Tour of Ireland 2016
2014: **Ireland's Oceans**: featured in programme on dolphins. RTE 1
2014: **Coast**: Irish programme on west coast of Ireland. TV3
2013: **Nationwide**: special feature on 20 years of studying the Shannon dolphins. RTE 1
2011: **Farraigínah Éireann:** 6 part series on the seashores of Ireland. SeaFever Productions for TG4
2010: **Monty Halls Great Irish Escape**: filiming during summer 2010 for third series of Monty Halls Great Escape where Monty Hal will be working under Simon Berrow for the IWDG. Tigress Productions for BBC. And shown on RTE
2009: ***Wild Journeys*** by Crossing-the-Lines, big production on migration in Ireland featuring whales and basking sharks. Transmission due in March 2010.
2008: **TEDx Dublin "***How do you save a shark you know nothing about*" Presented in September 2008, onto **TED.com** March 2010. >600,000 views
2008: ***Living the Wildlife*** (GMTV); ***Munitarna Mara*** (TG4); ***Eco-Eye*** (RTE)
2007: ***The Estuary: Secret of the Shannon***: Four part documentary on the Shannon estuary. Baily Films
2007: ***Coast***: featured in BBC Coast programme from west coast of Ireland. BBC2
2006: ***The Next Level: Marine Biologist***: 30 minute programme for BBC1 on becoming a marine biologist. BBC1
2004-5: ***Soundwaves***: a 50 minute programme on Shannon dolphin Vodafone programme with Widervision.
2004: ***The Return of the Humpback whale***: Presenter on 50 minute documentary about expedition to locate breeding grounds of humpback whales off Cape Verde. Ergo Films

Contributed to a number of news items on RTE 1 and 2 and TV3 and TG4 as well as Nationwide (2004). Have considerable experience of live radio having carried out interviews on radio programmes throughout the world from Europe, the US and Australia

Large Projects Managed and Delivered

I have been running two NGOs over the last 20 years. The Irish Whale and Dolphin Group (see www.iwdg.ie) is an All-Ireland NGO who's main role is to co-ordinate cetacean stranding and sighting schemes. Turnover varies currently between €400-500,000. I was Manager of the Shannon Dolphin and Wildlife Foundation (www.shannondolphins.ie) between 2000 and 2019, which was a group of stakeholders interested in the Shannon dolphins and run an education and research centre in Kilrush, Co Clare with an annual turnover up to €50,000.Through these groups and independently I have been successful in obtaining a range of funding for a range of projects and been responsible for their delivery on behalf of the IWDG.

Harbour Porpoise Surveys: we have won seven contracts since 2007 to survey inshore sites all around Ireland for harbour porpoise. We have developed a small scale survey technique using a single platform and distance sampling. See Berrow et al. (2007; 2014) O'Brien and Berrow (2016; 2017; 2018; 2020; 2021; 2022). Contracts worth a total of €450,000.

Nearshore Surveys: I have managed three contracts from the National Parks and Wildlife Service to carry out cetacean surveys between 6 and 12 nmls offshore at six sites around Ireland. Surveys were carried out in 2010, 2011 and 2012. Contracts worth a total of €150,000.

Humpback Whale Research in Cape Verde: In 2003 we sailed from Ireland to Cape Verde Islands off Senegal in west Africa in search of humpback whales. In 2006 we returned, this time chartering a yacht and flying in skippers and crew. In 2010 and 2011 we based the work onshore at Boavista and carried out daily surveys in a RIB as part of a PhD project. Current research involves genetic analysis of samples which has established the CVI population is genetically discrete and is the only site in the Atlantic where populations from both hemispheres breed. See Berrow et al. (2003; 2006; 2014; 2018; 2019; 2021), Wenzel et al. (2009; 2020); Ryan et al. (2012; 2013a; 2013b, 2014); Berube et al. (2013). Contracts worth a total of €150,000.

Fisheries Observer Studies: In 1994-95 I was a partner in the first cetacean bycatch study on gill-netting fishing in the Celtic Sea which quantified harbour porpoise bycatch for the first time in the EU. I have been a partner on an study of trawl fisheries. We also have been contracted to test acoustic deterrents designed for trawl nets. Currently carrying out Observer Scheme, funded by the Celtic Sea Herring Management Advisory Committee of the Celtic Sea Herring fishery for 4th consecutive year. See Tregenza et al. (1997a; 1997b); Morizur et al. (1999); Leeney et al. (2007); Berrow et al. (1998; 2009). Contracts worth a total of €150,000.

Basking Shark Research. My interest in basking sharks dates back to 1995 when I won funding from the EU to establish a sighting scheme and attempt to tag sharks. Knowledge of their distribution and seasonality was poor and in 2008 we did manage to deploy individually coloured numbered tags and have deployed over 500 tags since. Current research revolves around tagging at three sites in Ireland and collecting mucus samples for genetic work. Two satellite tags were deployed in 2009 with mixed results. See Berrow and Heardman (1997); Lieber et al. (2013; 2020), Sims et al. (2022). Contracts worth a total of €40,000.

Shannon Dolphins: a project on the bottlenose dolphins was started in 1993 (20 years ago), which involved carrying out line transects with photo-id and behavioural observations. This has led to the establishment of a photo-id catalogue of 45,000 images of around 250 individual dolphins and contributing to genetic studies. See Foley et al. (2010); Berrow et al. (2002; 2011; 2022); Mirimin et al. (2011); Louis et al. (2014), Baker et al. (2018; 2019), Nykänen et al. (2019), Blasquez et al. (2020) and Ludwig et al. (2021). Contracts worth a total of c.€250,000.

Marine Mammals and Megafauna in Irish Waters: this was a three-year project (2009-2011) funded by the Marine Institute and National Parks and Wildlife Service, with four work packages ranging from offshore ship surveys, acoustic monitoring and tracking. See Wall et al. (2013). Contract worth a total of €505,000.

Acoustic Surveys for Cetaceans in the Irish Atlantic Margin (ObSERVE-Acoustic) –A three-year project (2015-2018) *providing robust scientific knowledge with respect to protected species occurrence and ecology along the Irish Atlantic Margin*. Funded by the Department of Communications, Energy and Natural resources, Galway-Mayo Institute of Technology are the Prime Investigator in collaboration with JASCO Applied Sciences, SMRU Limited and the Marine Institute. Contracts worth €1,000,000.

Name: Stephanie Levesque
Current Position: MMO
Institution: The Irish Whale and Dolphin Group
Telephone: 0831641390
E-mail: salevesq@gmail.com

Education:
2005 - 2009: Bachelor of Science in Psychology at the University of Massachusetts Amherst
2011 - 2013: Master of Science in Wild Animal Biology at the University of London's Royal Veterinary College. Thesis was on the *Pathological and Morphological trends among single, mass, and bycaught common dolphins (Delphinus delphis) from New England, U.S. waters 2012.*

MMO Experience and Qualifications:

- Jun – Sept 2014 | Marine Mammal Observer – Doolin Pier Blasting
- June 2014 | Marine Mammal Observer – Dedicated Harbour Porpoise surveys in the SAC around the Blasket Islands, Co Kerry
- May 2014 | Marine Mammal Observer and LOGGER operator aboard the *R.V. Celtic Voyager*
- April 2014 | Multidisciplinary Ship-based Training aboard *R.V. Celtic Voyager*
- March 2014 - Present | Marine Mammal Observer – PhD research assistant for bottlenose dolphin surveys
- July 2013 – September 2013 | Marine Mammal Observer & LOGGER Operator - assisted in dedicated harbour porpoise surveys off Dublin Bay
- July 2013 | Marine Mammal Observer - Monitoring surveys on the IWDG's *R.V. Celtic Mist* in Tralee Bay, recording behaviour and carrying out photo-identification to measure the extent of the home range for the resident Shannon bottlenose dolphins
- July – August 2013 | Marine Mammal Observer - Monitoring surveys on tour boats in the Shannon Estuary
- April – July 2013 | Marine Mammal Observer & Hydrophone Operator – assisted in dedicated bottlenose dolphin and harbour porpoise surveys along the west coast of Wales, as well as casual surveys onboard the tour boats in New Quay and Cardigan Bay.

Other Qualifications:

- Personal Survival Techniques (PST) STCW-95 with SeaTec Maritime Training | 2014
- JNCC Marine Mammal Observer course with Intelligent Ocean | 2013
- Passive Acoustic Monitoring course with Intelligent Ocean | 2013
- Cetacean Stranding Management with British Divers Marine Life Rescue | 2012
- Seafarer's Medical (ENG111) | 2014
- Multidisciplinary Ship-based Training with SMART | 2014

Appendix III: DATA FORM FOR COASTAL/MARINE WORKS - RECORD OF OPERATION/ACTIVITY

Platform name: CAPPA PIER **Platform type:** PIER **Client**: KILRUSH MARINA **Contractor:** IRISH WHALE&DOLPHIN GROUP **MMOs:** SIMON BERROW and STEPHANIE LEVESQUE

Complete this form every time the sound-producing operation or activity (e.g., drilling, pile driving, blasting) occurs including overnight, whether for testing, full operation or any other purpose.

		Sound-producing operation or activity			**Pre-Start Monitoring effort for marine mammals**					**Action necessary**		
Type of operation or activity Dredging, Drilling, Pile driving, Blasting, other	**Date** (dd/mm/yyyy)	Time when ramp-up/soft-start began [if any] (GMT/UTC)	Time when equipment reached full power (GMT/UTC)	Time when equipment stopped or shut down (GMT/UTC)	Who carried out the monitoring for marine mammals? (Job Title)	Start time of monitoring for marine mammals [Pre-start-up] (GMT/UTC)	End time of monitoring for marine mammals (GMT/UTC)	Reason for non-detection of marine mammals? (e.g. sea state, swell, glare, poor light, fog, rain, etc.)	Were hydro-phones used? (Yes/No)	Were marine mammals present in the 30/60 mins before start-up? (Yes/No)	If Yes, give time when marine mammals were last seen (GMT/UTC)	If marine mammals were present, what action was taken? (e.g., delay ramp-up/soft start, delay full start-up)
DREDGE 1	07/04/2024	19.00	19.05		MMO	18.30	19.05	-	NO	NO	-	-
DREDGE 2	08/04/2024	06.45	06.50		MMO	06.15	06.50	-	NO	NO	-	-
DREDGE 3	08/04/2024	18.00	18.05		MMO	17.30	18.00	-	NO	NO	-	-
DREDGE 4	09/04/2024	6.55	07.00		MMO	06.17	06.50	-	NO	NO	-	-
DREDGE 5	09/04/2024	18.40	18.45		MMO	18.05	18.45	-	NO	YES	18.30	DELAY
DREDGE 6	10/04/2024	07.00	07.05		MMO	06.30	07.05	-	NO	NO	-	-
DREDGE 7	11/04/2024	07.25	07.30		MMO	06.45	07.30	-	NO	NO	-	-
DREDGE 8	11/04/2024	19.55	20.00		MMO	19.25	20.00	-	NO	NO	-	-
DREDGE 9	12/04/2024	08.10	08.15		MMO	07.40	08.15	-	NO	NO	-	-

Appendix IV: MARINE MAMMAL RECORDING FORM - EFFORT

Location: KILRUSH **Platform name:** CAPPA PIER **Platform type:** PIER **Client:** KILRUSHMARINA **MMO(s):** SIMON BERROW and STEPHANIE LEVESQUE

Type of operation or activity Dredging, Drilling, Pile driving, Blasting, other	**Date** (dd/mm/yyyy)	**Marine Mammal Observer** (name/initials)	Time you began monitoring for marine mammals (GMT/UTC)	Time you stopped monitoring for marine mammals (GMT/UTC)	Duration of monitoring watch (minutes)	Duration of the sound-producing operation/activity while you were monitoring for marine mammals (minutes)	Start Lat/Long position (if static/moving)	End Lat/Long position (if moving)	Wind direction & Beaufort wind force (e.g., SW 2)	Sea State (WMO) (0 to 9)	Swell height Choose from: 0 = no Swell L = 0-1 m M = 1-2 m H = 2+ m	Visibility Choose from: P = < 1 km M = 1-5 km G = 5-10 km H = >10 km
CANCELLED	07/04/2024	SB	16.45	17.20	35	-	52.627254	52.627254	S5	4	L	G
							-9.499444	-9.499444				
DREDGE 1	07/04/2024	SB	18.30	19.05	35	5	52.627254	52.627254	S5	4	L	G
							-9.499444	-9.499444				
DREDGE 2	08/04/2024	SB	06.15	06.50	35	-	52.627254	52.627254	0	0	0	G
							-9.499444	-9.499444				
DREDGE 3	08/04/2024	SB	17.30	18.00	30	-	52.627254	52.627254	SW2	2	0	H
							-9.499444	-9.499444				
DREDGE 4	09/04/2024	SB	06.17	06.50	33	-	52.627254	52.627254	SW4	3	0	M
							-9.499444	-9.499444				
DREDGE 5	09/04/2024	SL	18.05	18.45	40	-	52.627254	52.627254	W3	4	0	M
							-9.499444	-9.499444				
DREDGE 6	10/04/2024	SL	06.30	07.05	35	-	52.627254	52.627254	S3	2	0	H
							-9.499444	-9.499444				
DREDGE 7	11/04/2024	SL	06.45	07.30	45	-	52.627254	52.627254	S3	1	0	H
							-9.499444	-9.499444				
DREDGE 8	11/04/2024	SL	19.25	20.00	35	-	52.627254	52.627254	SW5	4	0	G
							-9.499444	-9.499444				
DREDGE 9	12/04/2024	SL	07.40	08.15	35	-	52.627254	52.627254	S3	2	0	H
							-9.499444	-9.499444				

Appendix V: MARINE MAMMAL RECORDING FORM - SIGHTINGS

Options in italics should be circled or underlined as appropriate. Complete 1 record per sheet.

Operation/Activity (please tick)	**Dredging**	**Drilling**	**Pile Driving**	**Blasting**	**Other** NO ACTIVITY

Date (dd/mm/yyyy)	**Time** (Local)	**Time** (GMT/UTC)	**Sighting Record no.**
09/04/2024	18.30	17.30	1

How did this sighting occur? (please tick)

While you were keeping a continuous watch for marine mammals X

Spotted incidentally by you or someone else ___

Other (please specify) ___

Details:

Platform type & name (e.g. ship, rig, headland)	**Observer's name**
Cappa Pier	Stephanie Levesque

Observer's position (Latitude/Longitude or 6-figure Grid reference)	**Water depth** (metres) (if available)
52.627254, -9.499444	8m

Species recorded	**Certainty of identification** (underline)
Otter (*Lutra lutra*)	**Definite / probable / possible**

Total number of animals (best estimate)	**No. of adults**	**No. of juveniles**	**No. of calves**
1	**1**	**0**	**0**

Maximum number (estimated total)	**Minimum number** (estimated total)
1	**1**

Description (include features such as overall size; shape of head; position, shape and size of dorsal fin; colour and patterning; height, direction, shape of blow)	**Photograph or video taken** *Yes / No*
	Direction of travel of animals in relation to platform/vessel (draw arrow) <-
Behaviour Swimming heading east.	**Direction of trave lof animals** (compass points or degrees) 275°

Activity of platform/vessel	**Operation/activity under way** (when animals first seen)	**Closest distance of animals from platform/vessel** (metres) (Record even if not operating)
None	*Yes / No / Pre-Start watch*	200 m