

## Summary Findings - STRIVE Report No. 120

### Assessment and Monitoring of Ocean Noise in Irish Waters

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**Abstract** Sources of anthropogenic (man-made) ocean noise include noise emitted from activities such as shipping, seismic surveying, geophysical surveying, construction, oil drilling and production, dredging, sonar systems, acoustic deterrents and most recently from the construction and operation of renewable energy platforms.

Anthropogenic ocean noise can elicit a range of physical, physiological and behavioural effects on marine animals. Marine mammals (cetaceans) are one of the more sensitive groups of marine species because they have a highly developed hearing system and use sound actively for feeding and for communicating. A leading research group at the Galway-Mayo Institute of Technology aimed to address Ireland's requirements under Descriptor 11 of the MSFD Marine Strategy Framework Directive.

This project has highlighted a number of potential avenues for the assessment of ocean noise in Irish waters and through trial deployments has increased capacity within Ireland for the implementation and operation of an ambient noise monitoring network under the MSFD. A protocol has been designed by the research team, which if implemented would allow Ireland to comply with the noise criteria defined in the MSFD.

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**Key Words** Ocean noise, shipping, seismic surveys, marine mammals, Marine Strategy Framework Directive (MSFD)

#### Background

A number of existing legislation, relevant to Ireland, are in place to assess and lessen the impacts of anthropogenic noise in the marine environment. The most relevant international policy is the EU Marine Strategy Framework Directive (MSFD) (2008/56/EC). The main aim of the MSFD is that European seas achieve Good Environmental Status (GES) by 2020. Under this directive member states hope to reach a balance between using the ocean as a natural resource and the ability to achieve and maintain good environmental status of marine waters. The present project aimed to address Ireland's requirements under Descriptor 11 of the MSFD. As advised by the Commission (1 September 2010), under Descriptor 11, two indicators have been developed with specific criteria in order to measure whether GES has been achieved. These indicators are 11.1.1 Low and mid frequency impulsive noise and 11.2.1 Low frequency continuous noise. The problem faced by conservation actions is a lack of information about the effects of anthropogenic sound on marine species which will enable Member States to determine whether GES has been reached. Two sources of anthropogenic noise were the focus of the assessment in this project; seismic surveying and vessel traffic.

## Key points/ Findings

- A review of existing noise monitoring programmes and available equipment and an assessment of strategies and technical solutions for a long term noise monitoring programme, for Irish waters was undertaken.
- There is a considerable amount of existing infrastructure deployed in Irish waters from which ocean noise measurements could be made.
- As a step towards collaborative monitoring and regional reporting under MSFD this project worked towards producing a common register of impulsive noise. Data of seismic surveys conducted in UK waters in 2011 and 2012 were obtained from the JNCC and the DECC in the UK and mapped alongside seismic surveys conducted in Irish waters during the same timeframe.
- A long-term deployment was designed to obtain a dataset for analysis and test the efficacy of monitoring equipment provided by the Spanish partners (UPC LAB, in Irish waters) also providing the first real-time monitoring of noise in Irish waters, while allowing for public participation through [www.listentothedeep.com](http://www.listentothedeep.com) real time access.
- Shipping analysis used Vessel Monitoring System (VMS, sourced from the Irish Naval Service) and Automatic Identification System (AIS, sourced from the Dept. of Transport) datasets to effectively assess vessel density across the Irish EEZ highlighting 'noisy' areas.
- Shipping analysis results highlighted high vessel density areas along the east and south coast, likely to be attributed to passenger ferries, and areas along the south coast and further offshore south and south west within Ireland's EEZ subject to high fishing vessel densities.
- Cetaceans have been continually highlighted as a high risk group likely to suffer negative impacts and this project assessed spatial overlaps of seismic surveying with baleen whales and other cetacean species, using results from the seismic survey bang day analysis and visual sightings data provided by the Irish Whale and Dolphin Group (IWDG). Of particular concern was the overlap highlighted between low-frequency cetaceans along the south and south-west coast of Ireland. Low-frequency cetaceans were also predominant along the north-west continental shelf slope areas and slopes of the Porcupine Bank concurrent with high fishing vessel densities.

## For Further Information

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**Publications connected to this work:** Beck, S., O'Brien, J. O'Connor, I., Berrow, S. (2012) Assessment of Indicator 11.1.1: Register of Impulsive Noise from Seismic Surveys. Report to the Environmental Protection Agency. EPA STRIVE Report Series Number 96.

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