INTERNATIONAL MARITIME ORGANIZATION

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MARINE ENVIRONMENT PROTECTION COMMITTEE
62nd session
Agenda item 19

MEPC 62/INF.22
6 May 2011
ENGLISH ONLY

NOISE FROM COMMERCIAL SHIPPING AND ITS ADVERSE IMPACTS ON MARINE LIFE

Information on Shipping Noise Research and Marine Biodiversity, with a special focus on cetaceans

Submitted by Spain

SUMMARY

Executive summary:	This document provides information on the on-going research to evaluate shipping noise impacts on cetaceans
Strategic direction:	1, 7 and 13
High-level action:	1.1.2
Planned output:	1.1.2.3
Action to be taken:	Paragraph 7
Related documents:	Resolutions A.989(25), A.982(24), A.900(21), A.720(17) and A.468(XII); MSC/Circ.1014; MSC 84/INF.4, MSC 83/28; MEPC 61/19, MEPC 60/18, MEPC 59/19, MEPC 59/19/1, MEPC 58/19, MEPC 57/INF.4 and MEPC 57/INF.22

Introduction

1 The acoustic environment is changing dramatically in the oceans due to increasing shipping and other human activities before we understand the consequences that that this might have on marine fauna and ecosystems. It has been traditionally accepted that rising levels of acoustic pollution have the potential to impact negatively on groups of marine mammals, such as cetaceans, which are known to rely on sound to communicate (Payne and Webb, 1971; Richardson, 1995). Low frequency ambient noise in the oceans may have increased by around 15 decibels (dB) in the last half a century due to human activities (Andrew *et al*., 2002). Under a simplistic assumption of spherical sound transmission in the open ocean, a 15 dB increase in low frequency ambient noise would translate to a reduction in the communication range of baleen whales to less than 20% of the range they had 50 years ago (Wright *et al*.) if signals are to be detected above ambient noise levels. Many species of toothed whales and dolphins use higher frequencies than baleen whales to communicate and use ultrasonic echolocation clicks to find and select their prey (Johnson *et al*., 2004;). Thus, rising background noise at high frequencies has the potential to reduce their foraging efficiency as well as their ability to communicate (Aguilar Soto *et al*., 2006).

On-going Research

2 A collaborative research effort between several European institutions (Fundación CRAM, Istituto Superiore per la Protezione e la Ricerca Ambientale, Alnitak Research Institute, Universidad de la Laguna and KAI Marine Services Ltd.), is being undertaken within the context of the European LIFE + Project: "Inventory and designation of marine Natura 2000 areas in the Spanish sea" to gather baseline data of noise levels in the oceans and particularly in biologically sensitive areas and to investigate the potential of noise from shipping channels to interfere with biological signals within marine protected areas and provide acoustic maps of Nature 2000 MPAs.

3 Within this context, between 5 and 9 April 2011, a new research effort was conducted in the central Tyrrhenian Sea (Mediterranean Sea). The campaign was specifically aimed at obtaining underwater sound recordings of Pax and RoRo-Pax vessels, as well as other oceanographical and meteorological parameters. Ten vessels were identified (by means of AIS) in 2 different sessions, where meteorology allowed working. Measurements were taken according to recently published indications given by ANSI and ISO (draft-) standards. Parameters such as Sound Pressure Level (SPL) and Sound exposure level (SEL) were derived for each ship in the frequency bands considered as indicators in the EU legislation[1].

4 Although results will be published in detail within the appropriate literature, we can anticipate that all of the vessels recorded seem to have a potential of inducing behavioural disturbance to marine mammals up to variable distances, according with Southall *et al*., 2007[2].

Conclusions

5 Further investigation is needed to correlate underwater sound propagation parameters with each single ship's signature.

6 We strongly support that the work of the Correspondence Group on Noise continues to better identify critical questions to be addressed when assessing potential disturbance by commercial shipping, while regarding the on-going efforts made by other relevant fora in conservation to evaluate and where possible mitigate the impacts of marine noise pollution on marine biodiversity.

Action requested of the Committee

7 The Committee is invited to consider the information presented in this document, and where appropriate, use it in its further deliberations on noise from commercial shipping.

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1 EU Marine Strategic Framework Directive (DIRECTIVE 2008/56/EC). Descriptor 11: introduction of Energy, included underwater sound sources. 11.1: Spatio-temporal distribution of intermittent sounds of high, medium and low frequencies; 11.2: Continuous low-frequency sounds.

2 Exposure levels above which behavioural disturbance may occur:
- Exposure levels for single pulses:
- Sound exposure levels SEL: 183 dB re: 1 µPa2-s
- Exposure level for multiple pulses:
- Low-frequency cetaceans: 120 dB re: 1 µPa RL (RMS/pulse duration)
- Medium-frequency cetaceans: 90-180 dB re: 1 µPa RL (RMS/pulse duration)
- High-frequency cetaceans: na
- Exposure level for non-impulsive sounds:
  - Low-frequency cetaceans: 100-110 dB re: 1 µPa RMS SPL
  - Medium-frequency cetaceans: 110-120 dB re: 1 µPa RMS SPL
  - High-frequency cetaceans: 140-150 dB re: 1 µPa RMS SPL.

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