

IMPLEMENTING THE MARINE STRATEGY FRAMEWORK DIRECTIVE – CHALLENGES IN MANAGING UNDERWATER NOISE

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The EU's Marine Strategy Framework Directive aims to improve the condition of all of Europe's seas and ensure that human usage of the seas is sustainable. The Directive will work by requiring EU Member States to set a series of objectives for eleven Descriptors of Environmental Status. One of the descriptors concerns underwater noise: *"Introduction of energy, including underwater noise, is at levels that do not adversely affect the marine environment."* Two types of underwater sound will be addressed by indicators of the descriptor – high amplitude (loud), low and mid frequency impulsive sounds and ambient sound within the frequency bands dominated by shipping.

Two international groups of experts have addressed the issues underlying the ambitions of the Directive in order to provide practical ways forward. In doing so, some of the greatest challenges have been due insufficient knowledge of the full effects of sound on marine life. This work provides a good example of the results of legal requirements meeting the uncertainties of biological science.

The paper will describe the processes outlined above and outline likely future outcomes and research needs.