
Masking of fish calls by man-made sounds

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Abstract

Many fish produce sounds as part of their reproductive behaviour. Important food fishes, including the cod and haddock, gather in large numbers on the seabed at particular locations, with the male fish broadcasting low frequency calls. Both cod and haddock show lekking behaviour, where females visit aggregations of males and select males on the basis of their sounds. Other exploited species like the brown meagre live on coastal rocky reefs, where spawning also involves extensive vocal displays by the males. The sites where these different fishes spawn, and the acoustical and other factors that bring fish together at these locations, are not well known. We have located spawning fishes in the sea by listening for the calls they make during their reproductive behaviour. The sounds of individual fishes are low in frequency and amplitude, and there is considerable scope for masking of the calls by man-made sounds. Noise from offshore activities like pile driving, seismic airgun surveys, naval sonars, dredging, and recreational and commercial shipping travels great distances in the sea. Noise levels are increasing, with dramatic effects upon natural marine soundscapes. The presence of this noise has deleterious effects upon the detection of fish calls, and may impair the ability of fish to discriminate between different sound producers, likely affecting mate selection. Masking of fish calls by man-made sound may therefore affect spawning success, with long-term adverse effects upon the sustainability of fish populations. Listening for fish sounds and monitoring the soundscape at spawning locations provides a reliable, non-invasive way of locating spawning aggregations in the sea. It may allow closer definition of reproductive areas and more detailed examination of the ecological requirements of spawning fish.

Keywords: fish, soundscape, spawning, reproduction, lekking, anthropogenic noise, masking

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