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TITLE: Sounds from seismic air guns: gear- and species-specific effects on catch rates and fish distribution

AUTHOR: ['Svein Løkkeborg', 'Egil Ona', 'Aud Vold', 'Are Salthaug']

ABSTRACT:

Previous studies found that sounds generated by seismic air guns led to pronounced reductions in commercial catches from trawls and longlines and the displacement of fish from fishing grounds. In contradiction to these findings and fishermen's concerns, we demonstrate here that gillnet catches were doubled for redfish ( *Sebastes norvegicus* ) and Greenland halibut ( *Reinhardtius hippoglossoides* ) during seismic shooting on a Norwegian fishing ground (86% and 132% increase, respectively, compared to preshooting levels). However, longline catch rates fell (16% for Greenland halibut, 25% for haddock ( *Melanogrammus aeglefinus* )). These contradictory results were explained by greater swimming activity versus lowered food search behaviour in fish exposed to air-gun sound emissions. Changes in catch rates of all species studied (including saithe (i.e., pollock, *Pollachius virens* ) and ling ( *Molva molva* )) were found, indicating that these species all responded to air-gun sounds. Except for saithe, acoustic mapping of fish abundance did not suggest displacement from fishing grounds. Less intense sound exposure compared with previous studies and strong habitat preference in some species may explain this finding.

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