

In situ determination of the impact of offshore pile driving on juvenile sea bass *Dicentrarchus labrax*

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To determine the impact of underwater sound generated by offshore pile driving, a field experiment was carried out on board of a piling vessel, exposing 68 and 115 days-old sea bass to the sound generated during 1.5 hours of pile-driving. The number of strikes ranged from 1740 to 3070, with a single strike sound exposure level between 181 and 188dB re1 μ Pa².s, resulting in cumulative sound exposure levels ranging from 215 to 222dB re1 μ Pa².s. Immediate and long-term survival of the exposed fish was high. However, exposed fish responded to the impulsive underwater sound by a 50% reduction in oxygen consumption rates (a secondary stress response) compared to the control groups. Data on cortisol concentrations will indicate whether juvenile sea bass also show primary stress responses. Under optimal lab conditions, we did not see effects on the fitness of the juvenile fish beyond the sound exposure period. However, it remains unknown whether the reduced fitness of juvenile fish is limited to the pile driving period in the real world as well. Our results indicate that impulsive sound close to the source creates sound pressure levels above the stress threshold, but below the lethal threshold for small sea bass.