

## Oral presentation proposition

**Theme:** Advances in habitat models to inform ecosystem-based management: from theory to practice  
**How space-time use by fishermen can be optimized to reduce sperm whales depredation impact in the Patagonian toothfish longline fisheries**

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## Abstract

Catch removal from fishing gears or depredation by marine mammals is a worldwide issue involving not only ecological, but also significant socio-economic consequences. The demersal longline fisheries for Patagonian toothfish within the French Exclusive Economic Zones (EEZs) of the Kerguelen Archipelago has been subject to heavy depredation by sperm whales since the start of the fisheries in the mid-1980s. The socio-economic and ecological impacts have increased throughout the years and currently, no single effective solution, such as acoustic deterrence, exists to alleviate or mitigate losses. We tested different scenarios of space-time use by fishermen in order to decrease whale encounter risk and subsequently, depredation rates as a straightforward solution to the depredation issue. In a first step, spatio-temporal distribution patterns of sperm whales in the Kerguelen EEZ from 11 years (2008-20017) of standardized observer data were analysed to investigate the overlap with fishing effort and productive fishing grounds. The results suggest that fishing effort and whale abundance do not always co-occur. In a next step, a Bayesian Belief Network (BN) for the EEZ will be developed to provide optimal space use suggestions throughout the year while taking into account current conservation measure for the ecosystem (e.g. MPAs, seabird bycatch risk areas) and minimize economic loss (e.g. additional fuel costs, lower catch yield) at the same time.

**Keywords:** habitat modelling, space-time use optimization, Marine mammal depredation, Southern Ocean

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