

Small scale multi-species functional response of northeast Atlantic minke whales

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Atlantic minke whales are important predators in the Barents sea ecosystem. They are generalists: their prey includes capelin *Mallotus villosus*, krill (*Thysanoessa* sp. and *Meganyctephanes norvegica*), and herring, *Clupea harrengus*, and their consumption of commercial species may present an economic problem for the local fishery. In order to estimate this consumption and understand the potential impact on prey dynamics, it is essential to determine the multi-species functional response of the whales.

To determine the functional response requires measurements of consumption rates and prey availability. In this study, undigested stomach contents were used to assess the consumption rates of minke whales immediately prior to capture. To determine the prey availability of the whales, standard acoustic surveys were run in the same area. The spatial distribution of prey was modeled using GAMs. In order to generate a measure of prey availability to the whale, the spatial overlap between prey and whales was calculated assuming a simple model for whale movement, and the uncertainty of this measure was estimated by bootstrap resampling of the prey data. A

multispecies functional response model was then fitted to the consumption and prey availability data using Bayesian methods.

The results indicate that minke whales display a type II functional response towards capelin and Krill, and a type III response to herring. These findings are consistent with a recent study of the impact of minke whales on Norwegian spring spawning herring, conducted on a larger spatial scale.