

Bioenergetics modeling of the annual consumption of zooplankton by pelagic fish feeding in the Norwegian Sea

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[Abstract]

There are indications of top down control of zooplankton by pelagic planktivorous fish in the Norwegian Sea (NS). The present study uses bioenergetics modeling to estimate the annual consumption of the main zooplankton groups by the most abundant small pelagic fish feeding in the NS: the Norwegian spring-spawning (NSS) herring (*Clupea harengus*), blue whiting (*Micromesistius poutassou*) and Northeast Atlantic mackerel (*Scomber scombrus*). The study takes advantage of intensive sampling from surveys in the area in the period 2005-2010. By incorporating information about seasonal growth and changes in the diet from stomach content analyses, annual consumption of the different zooplankton groups by pelagic fish can be estimated. Moreover, this is the first study to quantify annual zooplankton consumption in the NS for different prey groups. Preliminary results show that NSS herring annually consume between 6 and 9 times their total biomass, which is higher than the estimated consumption from previous studies. The main prey groups are calanoids, appendicularians or euphausiids and amphipods, but the relative importance of each group show inter-annual variability. For instance, in 2005-2006 the total consumption of herring is mainly comprised by calanoids, whereas in later years the predation pressure seems to be unexpectedly higher upon appendicularians and larger krill. The estimates and their inter-annual and inter-specific variation is useful for understanding fundamental pelagic predator-prey interactions as well as to inform advanced multispecies ecosystem models.