

7. MONITORING OF INTERACTIONS BY DIET STUDY

7.1 Trophic studies of capelin and polar cod

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In the Barents Sea, diet data for capelin (*Mallotus villosus*) and polar cod (*Boreogadus saida*) were collected during the Joint Norwegian-Russian ecosystem survey in August-September respectively during the period 2005-2012 and 2007-2012. IMR generally takes stomach samples from 10 fish at each station, while PINRO samples more fish (up to 50) at fewer stations. Because Russian data on stomach content are in wet weight and Norwegian data in dry weight, a wet weight/dry weight conversion factor of 5.0 was applied.

The size of the capelin ranged from 6.5 to 19.5 cm and for polar cod ranged from 5.5 to 27.0 cm. In the Norwegian data, the fish is measured to the nearest 0.5 cm (rounding downwards), while in the Russian data the fish is measured to the nearest 0.1 cm, but in the data conversion they were rounded to the nearest 0.5 cm (rounding downwards). For analysis of the variation of diet by size, the following size groups were used: for capelin below and above 12.0 cm, and for polar cod below and above 17.0 cm. The diet data of capelin from 2005 is based on few stations compared to other years and is mainly from the north central and eastern parts of the Barents Sea.

Eight years (2005-2012) of capelin diet was examined from the Barents Sea where capelin is a key forage species, especially of cod (*Gadus morhua*). The capelin stock size has been relatively high during the last 6 years (ca. 3.8 million tonnes), exerting a high predation pressure on zooplankton. The PINRO/IMR mesozooplankton distribution shows low plankton biomass in the central Barents Sea which in a way also reflected in the total stomach fullness index, which has decreased especially since 2009, with the lowest in 2012. In the Barents Sea, a pronounced shift in the diet from copepods to krill, mostly *Thysanoessa inermis* was observed (especially in larger capelin >12.0 cm, not shown), with krill being the largest contributor to the diet weight in most years (Figure 7.1.1). Probably it results to decreasing of feeding intensity of capelin, especially since 2009. Amphipods contributed a small amount to the diet of capelin. The migration of capelin into northerly areas (>80 °N) are observed in the recent years due to more ice free area, which may make capelin more accessible to the arctic zooplankton.

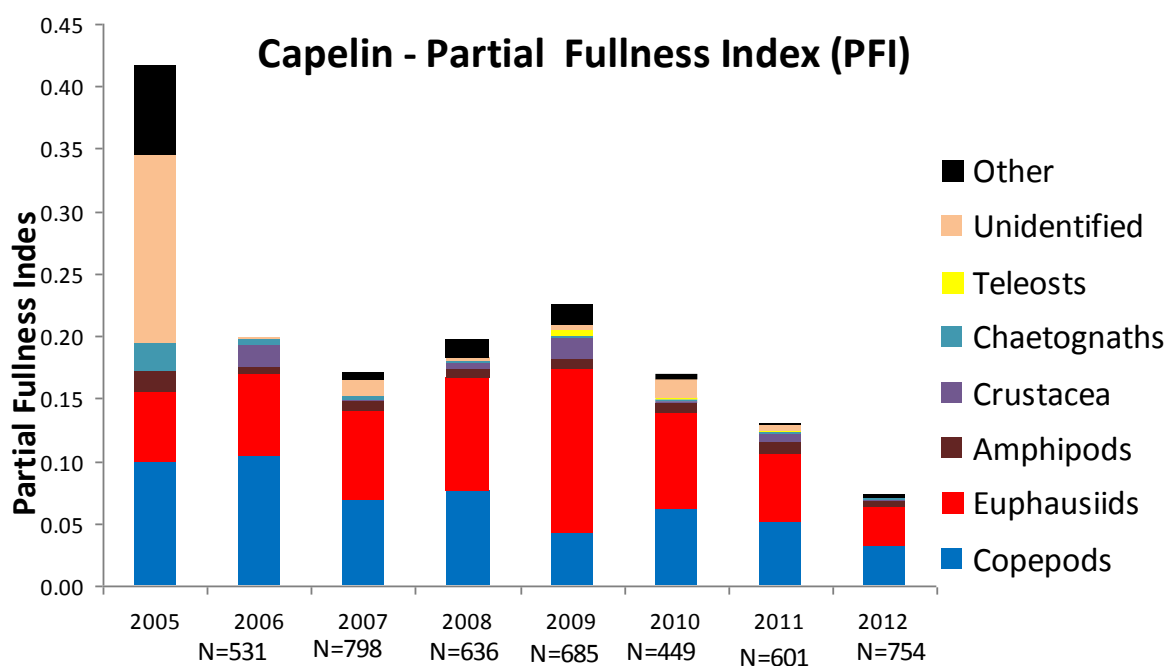


Figure 7.1.1 Diet composition and feeding intensity of capelin in the Barents Sea in 2005-2012

The diet data from 2005 to 2012 indicate that polar cod mainly feed on copepods, amphipods (mainly hyperiids, occasionally gammarids) and euphausiids, and to a lesser degree on other invertebrates (Figure 7.1.2). Large polar cod may also prey on fish. Similar to capelin, the total stomach fullness index decreased since 2009 and was the lowest in 2012.

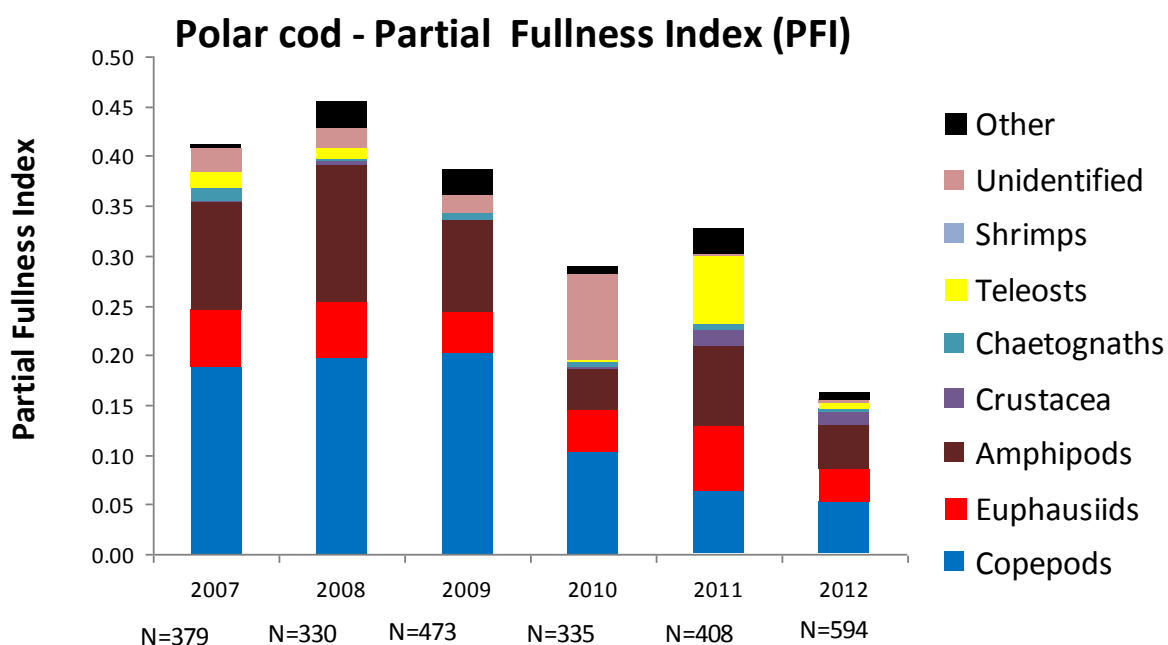


Figure 7.1.2 Diet composition and feeding intensity of polar cod in the Barents Sea in 2005-2012