

Spatial migration pattern of deep-sea redfish (*Sebastes mentella* Travin) in the Barents Sea as inferred from long-term research survey series

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Extended abstract

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Fishery for the deep-sea redfish (*Sebastes mentella* Travin) in the Barents and Norwegian seas dates back to 1952 (Zakharov *et al.*, 1977). Scientists have studied many issues of the deep-sea redfish biology. Nevertheless, one of the crucial issues for both understanding the life history and fishery management is the migration, and this has not yet been adequately explored.

Study of redfish migration by traditional tagging-methods faces great difficulties. The redfish taken onboard a vessel usually prove to be nonviable. A sharp hydrostatic pressure differential is lethal for the redfish having a closed swim bladder.

The main purpose of the present paper is to determine migration pattern of the deep-sea redfish (*Sebastes mentella*) juveniles. To study the deep-sea redfish migration, data from Russian and Norwegian scientific trawl surveys conducted during autumn and winter of 1982-1995 were used.

The Petersen method was applied to analyse size composition of the deep-sea redfish catches taken during the above trawl surveys. The conclusion made from prior researches that the deep-sea redfish year classes of 1982 and 1988 were strong compared to their neighboring ones was confirmed.

On the assumption that "peaks" in the length distributions of survey catches displayed strong yearclasses, the annual corresponding lengths were defined for the 1982 and 1988 year classes of deep-sea redfish at different ages (from 0 to 7 years). Subsequently, using the database from trawl surveys and knowing the length of the deep-sea redfish from strong yearclasses at different ages, the distribution of these yearclasses by year was mapped. Based on the analysis of these maps, migration patterns of the deep-sea redfish juveniles in the Barents and Norwegian Seas were plotted.

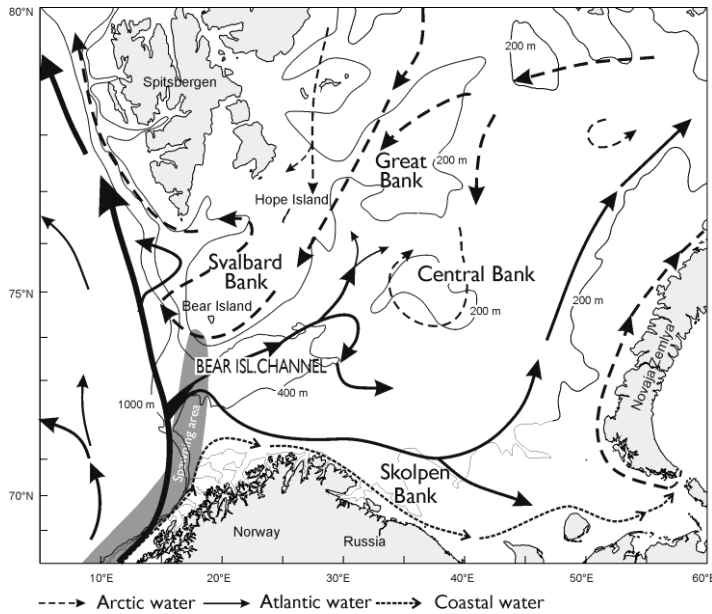


Figure 1. Dominating prevalent current systems in Norwegian Sea/ Barents Sea. Whole lines – warm Atlantic water, dotted line – warm coastal water, and stipled line - cold Arctic currents. Spawning area of *Sebastes mentella* has been emphasized (grey area).

From spawning areas along the continental slope from 62°N to the Bear Island (Mukhina *et al.*, 1992; Nedreaas, 1995), juvenile redfish drift with the warm Atlantic currents (Fig. 1) to the Barents Sea and Svalbard areas. The main nursery areas of the juvenile redfish are the Bear Island Channel and waters adjacent to the southwest of the Central Bank and continental slope along the western coast of Spitsbergen (Figure 2). During the first years of life (age 0 and 1) the redfish juveniles also drift to the Skolpen Bank, but later on, concentrations in this area are not observed.

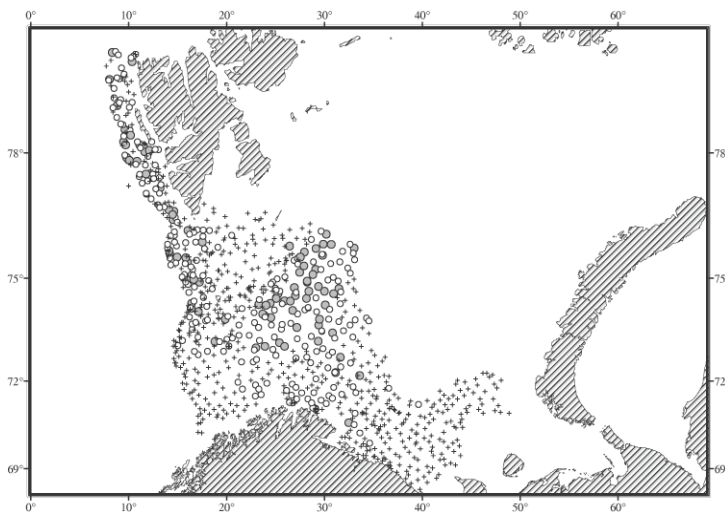


Figure 2. Distribution of 13-17 cm *S.mentella* (age 3, yearclass 1982) in 1985. The circles represent the position of the tow, and the circle diameter corresponds to the percentage of the yearclass caught in a given position of its total catch during the whole survey.

This gives reasons to assume that the drift of a deep-sea redfish yearclass may last for the two first years of life. The deep-sea redfish are distributed within the nursery areas until they are 4 years old. From then on, the redfish start active migration against the current towards the mature population distribution areas.

References

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