

a) Mesh size for Redfish in Div. 3LN

Fisheries Commission requested Scientific Council to provide advice on: to examine the consequences resulting from a decrease in mesh size in the mid-water trawl fishery for redfish in Div. 3LN to 90mm or lower.(item 5)

Scientific Council advises:

Scientific Council concluded that the reduction of mesh size from 130 mm to not less than 90 mm for the pelagic redfish fishery appears not to be harmful to the Div. 3LN redfish stock.

However, measures should be taken to ensure one source of unaccounted mortality i.e. escape mortality at the surface is not replaced by another, i.e. discarding and/or high-grading.

It was observed that beaked redfish escaping from the trawl cod-end during haul-up die as a result of barotrauma as a result of the rapid change in hydrostatic pressure, and the weight of the catch in the cod-end. These escaped fish also suffer increased predation from marine mammals and seabirds.

Previous studies in Div. 3M showed that mid water redfish fishery is a clean fishery: 95% of the hauls do not have bycatch and so its impact on other stocks is minimal. The Scientific Council also notes that the same mesh size (90 mm) for mid-water trawl as already implemented on the pelagic redfish fishery on Div. 3M and Div. 3O.

The results of the research on decreasing the mesh size in pelagic trawls directed to beaked redfish (*Sebastes mentella*) was discussed by Scientific Council.

The research on redfish mesh selectivity during Russian special experiment in 2011 was presented to Scientific Council (SCR Doc. 13/20). Scientific Council recognized that there is considerable escapement at the surface and that this represents a loss of yield to the fishery. It was suggested that a solution to avoid this escapement of dead redfish was to use a smaller mesh in the cod-end. This would have the tendency to shift the size range of the fish lost to a smaller size.

At its September 2010 meeting Scientific Council analyzed the reduction in the mesh in the mid-water trawl fishery for redfish in Div. 3M. At that time Scientific Council concluded for Div. 3M, that the fish bycatch is low when the pelagic trawls are used well above the sea bed. However, it was also noted that some of the reported fish bycatch species were typically demersal species. This indicates that the newer pelagic trawls that are capable of fishing very near bottom could have bycatch concerns. Scientific Council received a response during the September 2010 meeting from the ICES working group on Fish Technology and Fish Behavior (WGFTFB) in response to a request from Scientific Council.

At its 2013 June meeting, Scientific Council considered the work done in ICES WGFTFB during the recent years (2010-2012) and one published paper related to this matter (Herrmann *et al.*, 2012. Understanding the Size Selectivity of Redfish (*Sebastes* spp.) in North Atlantic Trawl Codends. Journal of Northwest Atlantic Fishery Science, 44: 1–13). The main conclusions were that the consequences resulting from a decrease in mesh size in the mid-water trawl fishery for redfish in Div. 3LN to 90mm will be a decrease in L_{50} (length at which 50% of fish entering the cod-end are retained) from 34cm to 25cm, but the selection range (L_{75} - L_{25}) will decrease from 6.6 to 4.4cm.

Scientific Council acknowledges that there is some justification to reduce cod-end mesh size in redfish fisheries. However, measures should be taken to ensure one source of unaccounted mortality i.e. escape mortality at the surface is not replaced by another, i.e. discarding and/or high-grading. Scientific Council expresses its concerns about the definition of the mid-water trawl. Some newer pelagic trawls that are included in this category are capable of fishing very near bottom catching demersal fishes that usual do not happen in a common pelagic fishery and could bring bycatch concerns.

Scientific Council suggests that research efforts should concentrate on improving size selection during the towing process whilst minimizing hauling and surface escapement. In this respect Scientific Council conclude that modified sorting grids provide the best practical solution to improve size selection in redfish fisheries. In designing such grids fish behavior, construction, survival of escapees and handling considerations should be assessed. Scientific Council also recommends that the Russian studies on mesh-size and selectivity should be continued.