

vii) *Witch flounder in Div. 3NO reference points or proxies including B_{lim} (Item 9)*

With regards to witch flounder in Div. 3NO, the Fisheries Commission requests the Scientific Council to provide reference points or proxies, including B_{lim} .

Scientific Council responded:

Scientific Council analysed available data for Div. 3NO witch but was not able to recommend reference points at this time. Biomass indices in the mid 1980s were higher, but it was considered unlikely that they represent the highest level experienced by this stock. Thus in this case it was not appropriate to apply the 85% decline criterion for establishing a limit reference point. The lowest points in the biomass index occurred from 1993 to 1998, and measuring increase of the stock against this level is a useful metric, until a limit reference point can be calculated. Establishing reference points for this stock remains a priority in Scientific Council, and further analysis should continue, to be presented in the full assessment of this stock scheduled in 2014.

Scientific Council examined reference point (RP) calculations for Div. 3NO witch, including a review of previous work on RPs for this stock. Scientific Council's earlier conclusions were that it was not possible to adopt limit reference points (LRPs) based on those previous analyses. All available indices 4 survey series (Canadian spring and autumn, EU survey in NRA, and USSR/Russian series), Canadian CPUE, biological data, and catch from 1960-2012 were considered as possible sources of data. There has been no age-based data for this stock since 1993.

Scientific Council noted the variability and the different trends in the indices. In 2012, Scientific Council responded that the Canadian autumn survey probably has the best chance of being an index of total stock size. However, this index only covers the period 1990-2012, and not the earlier periods where other indices and catch were clearly higher. The Canadian spring survey index has data from 1973 to 2012, and was therefore considered the most useful index to examine for developing a possible LRP. To account for survey coverage in strata between 366 and 731 m in depth, which began in 1991, biomass index data prior to then was multiplied by 1.2, based on the average proportion of biomass in the deeper strata from 1991 to 1995.

This biomass index was highest in 1985 and 1988, at a level about 2.5 times the 2011–12 average, and lowest during 1993-98, at about one-third of the 2011–12 average. The newly developed SSB index shows similar patterns. SC concluded that the biomass in the 1980s, while higher, likely did not represent the highest stock size (B_0), given the high catches which occurred over several years in the 1960s and early 1970s. Thus in this case it was not appropriate to apply the 85% decline criterion for establishing a limit reference point.

Another candidate for a proxy for an LRP is the lowest biomass from which there has previously been a rapid and sustained recovery ($B_{recover}$). Scientific Council considered it unlikely that this criterion has been met for this stock, but that comparing current stock size to the low level of the 1990s would be a useful metric to monitor until an LRP can be calculated.

Scientific Council noted that establishing reference points for this stock remains a priority, and that further analysis should continue, to be presented in the full assessment of the stock scheduled for Scientific Council in 2014. Now that an SSB index has been developed, one aspect of the work should focus on possible SSB-recruit relationships, while further exploration of population modeling should be conducted.