

Towards an MSY-based management of Barents Sea capelin in an ecosystem context

Ingolf Røttingen and Sigurd Tjelmeland

The Barents Sea capelin is a short-lived, one-time spawner that at present is managed using a harvest rule where the probability for the spawning-stock biomass to be smaller than 200 000 tonnes shall not exceed 5%. This is implemented by carrying out probabilistic simulations from the time of stock measurement (1 October) to time of spawning (1 April), where the consumption by cod in the prespawning period January–March is accounted for. In the present paper, the long-term properties of this harvest rule are tested with probabilistic simulations using the multispecies simulator Bifrost. Properties investigated include long-term mean catch, long-term mean economic benefit, and extinction probability for capelin, as well as the influence of the capelin stock on the cod stock. Also, an alternative rule is investigated by using the spawning-stock biomass corresponding to maximum sustainable yield (MSY) as a basis. Comparisons between present and an MSY-based harvest-control rule (HCR) are made in a coastal ecosystem context, mainly including the value of capelin eggs and post-spawning (dead) capelin as food for other organisms, mainly king crab and haddock.

Keywords: pelagic fish stock, MSY management, probabilistic simulations, ecosystem considerations.

Contact author: Ingolf Røttingen, Institute of Marine Research, PO Box 1870, Nordnes, N 5917 Bergen, Norway [tel: +4755238404, e-mail: ingolf@imr.no].