Northern Shrimp in Subarea 1 and Div. 0A

Advice September 2015 for 2016

Recommendation

Previous work has shown that a maintained mortality risk of 35% is low enough to keep stock levels safely at or above B_{msy}. A catch of 90 000 t in 2016 would entail an estimated mortality risk below 35%. Scientific Council therefore advises that catches in 2016 should not exceed 90 000 t.

Management Objectives

Scientific Council is aware of the Greenland management plan for shrimp and of general management objectives specified in the Greenland Fisheries Act; however the contents of these have not been conveyed to the Council. Canada requested Scientific Council to provide advice on this stock within the context of the NAFO Precautionary Approach Framework (SCS Doc. 13/04).

Advice is based on risk analysis coming from a quantitative model, and on qualitative evaluation of biomass and stock-composition indices.

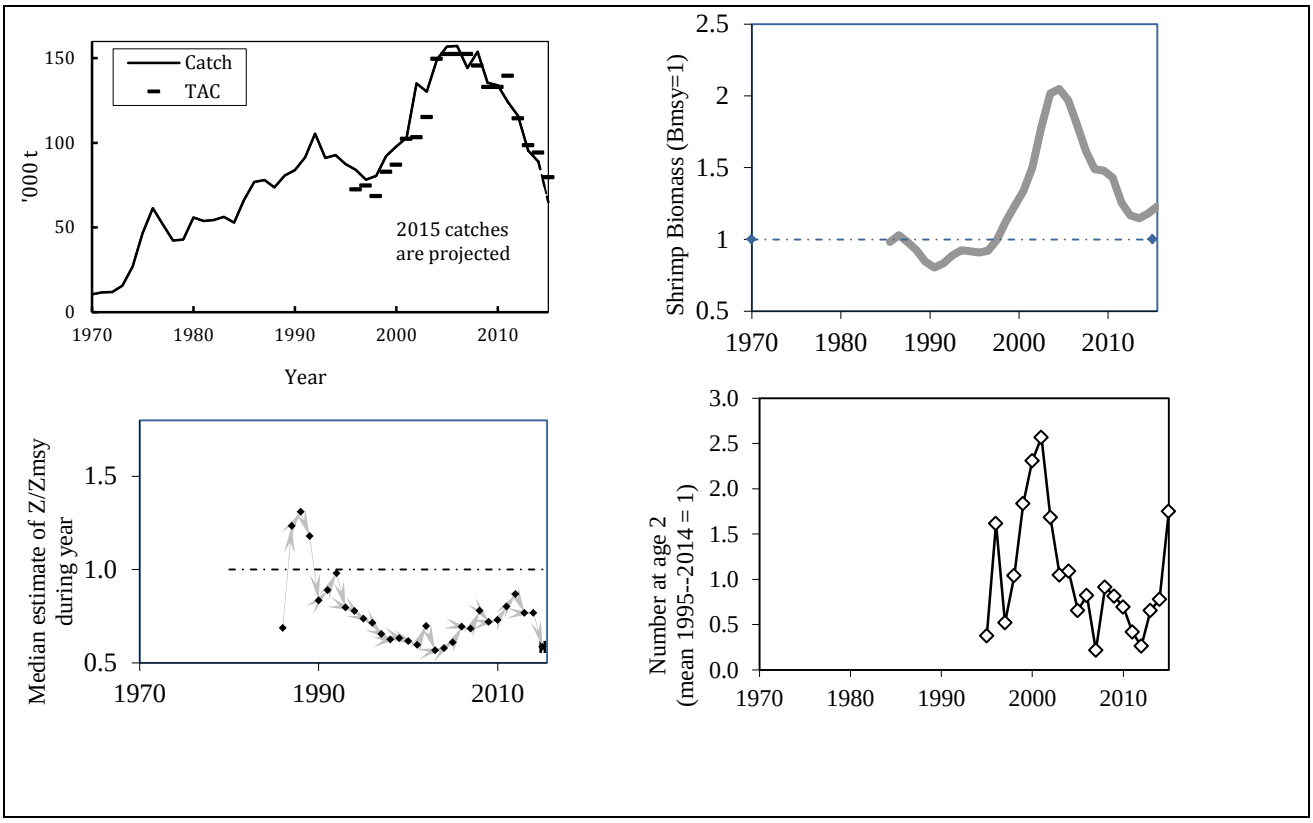
Objective	*Status*	*Comment/consideration*	
Apply Precautionary Approach		Stock status is both estimated and forecast relative to precautionary reference points	 OK

Management unit

The stock, considered distinct from all others, is distributed throughout Subarea 1, extends into Div. 0A east of 60°30'W, and is assessed as a single stock.

Stock status

A protracted decline in stock size since 2004 appears to have paused, and large numbers of small shrimps in the 2015 survey show good prospects for recruitment. At end 2015 the stock is expected to be 23% above B_{msy} and the risk of being below B_{lim} (30% of B_{msy}) is very low (<1%).



Reference points

B_{lim} is 30% of B_{msy} and the limit reference point for mortality is Z_{msy} (FC Doc. 04/18).

Projections

Predicted probabilities of transgressing precautionary reference points in 2016 – 2018 under seven catch options and subject to predation by a cod stock with an effective biomass of 55 Kt (the value for 2015 being 56Kt.).

55 000 t cod	Catch option ('000 tons)							
Risk of:	60	70	75	80	85	90	95	100
falling below B_{msy} end 2016 (%)	25	25.0	25	26	27	27	27	27
falling below B_{msy} end 2017 (%)	25	26.0	27	27	28	28	29	30
falling below B_{msy} end 2018 (%)	26	28	29	30	31	31	32	33
falling below B_{lim} end 2016 (%)	<5	<5	<5	<5	<5	<5	<5	<5
falling below B_{lim} end 2017 (%)	<5	<5	<5	<5	<5	<5	<5	<5
falling below B_{lim} end 2018 (%)	<5	<5	<5	<5	<5	<5	<5	<5
exceeding Z_{msy} in 2016 (%)	22	25	27	28	31	32	35	37
exceeding Z_{msy} in 2017 (%)	23	26	28	29	32	33	37	39
exceeding Z_{msy} in 2018 (%)	24	27	29	31.0	33	35	38	40.0

Assessment

The analytical assessment was run with the same basic model as in 2011–2014; minor changes in the coding (estimation of parameters of a functional relationship for cod predation; calculation of future mortalities) are described in SCR Doc. 15/49; and with updated data series.

The next assessment is scheduled for 2016.

Human impact

Mortality related to the fishery has been documented. Other human sources (e.g. pollution, shipping, oil-industry) are considered minor.

Biological and Environmental Interactions

Cod is an important predator on shrimps. This assessment incorporates this interaction. Other predation is likely but not explicitly considered. Shrimps might be important predators on, for example, fish eggs and larvae.

Fishery

Shrimps are caught in a directed trawl fishery. Bycatch of fish in the shrimp fishery is around 1% by weight. The fishery is regulated by TAC.

Recent catches and TACs (t) have been as follows:

	2008	2009	2010	2011	2012	2013	2014	2015
Enacted TAC[1]	145 717	132 987	132 987	142 597	118 596	102 767	94 140	79 561
STATLANT 21	148 550	133 990	129 179	123 195	115 080	91 802	88 834	-
NIPAG	153 889	135 458	133 990	123 985	115 975	95 380	88 765	65 000[2]

[1] sum of TACs autonomously set by Canada and Greenland;
[2] provisional—projected to year end.

Effects of the fishery on the ecosystem

Measures to reduce effects of the fishery on the ecosystem include area closures and moving rules to protect sponges and cold-water corals and to reduce bycatch, and gear modifications to reduce damage to benthic communities, and, again, to reduce bycatch.

Special comments

The number of large pre-recruits (14 – 16.5mm, expected to recruit to next year's fishable biomass) is close to its ten-year maximum, so prospects for short-term recruitment are good; this is true both in Disko bay and offshore as well. The number at age 2 in 2015 is well above its 20-year upper quartile.

In the recent past, TAC reductions have been implemented in steps of limited size. Increases should follow a similar method.

Source of Information SCS Doc 13/04, FC Docs 04/18 , SCR Docs 15/42, 43, 44, 48, 49.