Northern Shrimp in Subarea 1 and Div. 0A

Advice September 2013 for 2014

Advice for 2014
Scientific Council advises that catches in 2014 should not exceed 80 000 t. Scientific Council observed no significant changes in the state of the stock. A catch of 80 000 t in 2014 would entail an estimated mortality risk of 32% and would not, in the medium term, entail a high risk of driving the stock below B_{msy}.

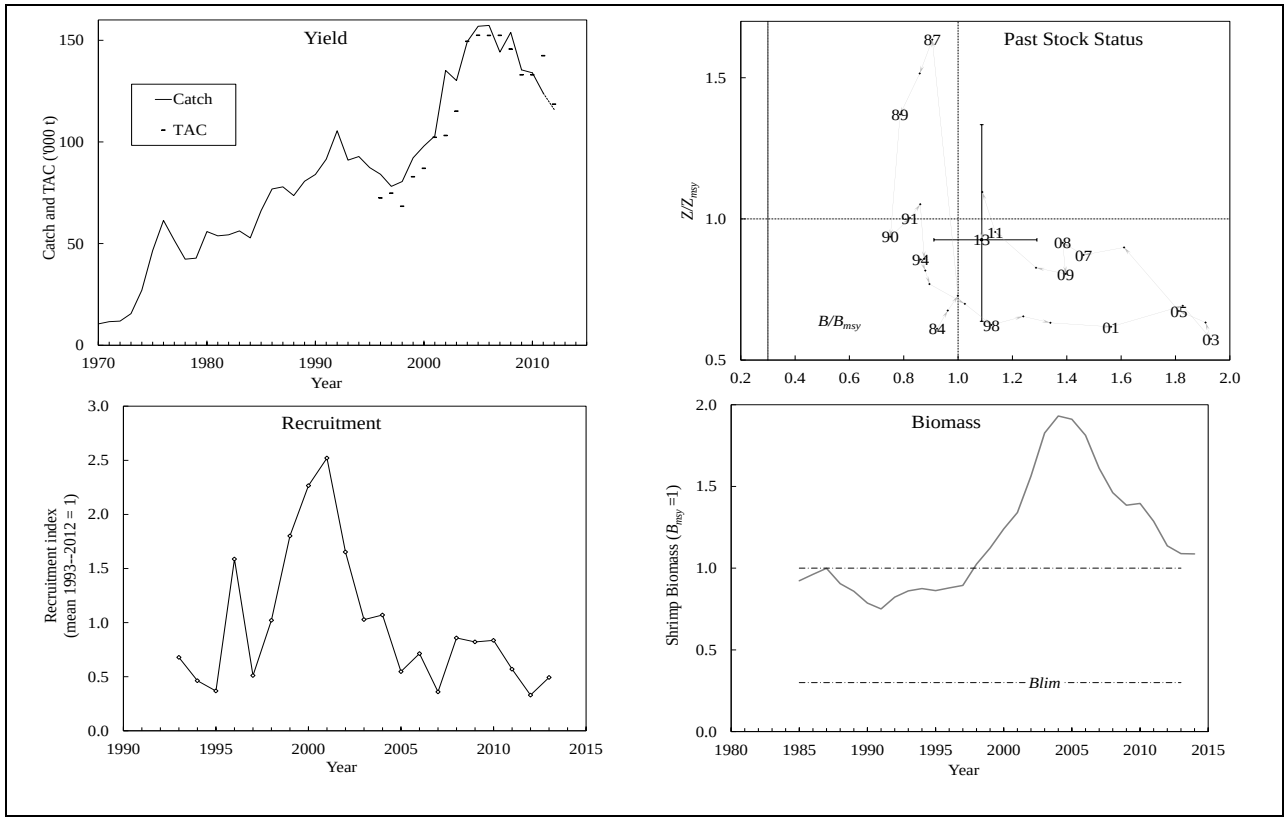
Management objectives
Scientific Council is aware of the Greenland management plan for shrimp and of general management objectives specified in the Greenland Fisheries Act; however the contents of these have not been conveyed to the Council. Canada requested Scientific Council to provide advice on this 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
Biomass is estimated to have been declining since 2004, but at the end of 2013 is projected to be about 10% above Bmsy. Total mortality in 2013 is not projected to exceed Zmsy. But the stock comprises a high proportion of females, so fishing will risk removing much of the spawning-stock biomass, and recruitment to both the fishable and the spawning stocks in both short and medium terms are all expected to remain low.



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

Projections
Projections for 2014 and 2016 were made with catch levels ranging from 50 to 110 Kt/yr and a cod stock biomass at 40 Kt.

2014

Catch (Kt/yr)	Probability (%) of transgressing:		
	Bmsy	*Blim*	*Zlim*
50	34.3	1.8	18.3
60	35.2	1.7	21.4
70	36.2	1.8	26.5
75	36.4	1.7	29.0
80	37.5	2.0	32.3
85	37.6	1.8	36.3
90	38.3	1.9	39.2
100	39.3	1.7	45.9
110	40.1	1.8	52.1

2016

Catch (Kt/yr)	Probability (%) of transgressing:		
	Bmsy	*Blim*	*Zlim*
50	30.1	3.1	19.3
60	31.3	3.1	23.2
70	34.4	3.2	28.1
75	35.4	3.5	30.9
80	37.6	3.6	34.2
85	38.6	3.4	37.3
90	39.7	3.7	40.7
100	42.4	3.6	47.3
110	44.5	3.9	54.0

Assessment
The analytical assessment was run with the same methods as in 2011–12 and with updated data series; the cod-stock estimate for 2012 was 2½ times that used in the 2012 assessment. The model converged with no pathologies and most of the error CVs had similar values to those of previous years. The CV of the term for cod predation was larger than in 2012 (SCR Doc. 13/054).

Human impact

Mortality in the directed fishery has been well documented. Other human impacts, including bycatch in other fisheries prosecuted on the same grounds, have not.

Biological and Environmental Interactions

Cod is an important predator on shrimps. This assessment incorporates this interaction.

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, and bycatch reduction measures include moving rules and Nordmøre grates.

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

	2006	2007	2008	2009	2010	2011	2012	2013
NIPAG	157 315	144 190	152 749	135 458	133 990	123 985	115 975	100 000[1]
STATLANT 21	156 976	144 123	148 550	133 990	129 179	123 195	115 080	—
Enacted TAC[2]	152 380	152 417	145 717	132 987	132 987	142 597	118 596	102 767

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

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 gear modifications to reduce damage to benthic communities.

Special comments
The future trajectory of the stock is likely to depend on the evolution of the stock of cod, which has recently been erratic and is difficult to predict.

Source of Information
SCR Docs 04/75, 04/76, 08/6, 11/053, 11/057, 11/058, 12/44, 13/54, 13/56, 13/57, 13/58, 13/59, SCS Doc. 04/12.