b) Northern shrimp in Denmark Strait and off East Greenland

Advice September 2022 for 2023

Recommendation

Catches of 2 500 t in 2023 will result in a low risk (6%) of biomass falling below B_{lim}. However, fishing at this level will result in a risk of more than 50% of fishing mortality exceeding F_{msy} and likely impede growth of the stock towards B_{msy}. SC recommends that catches should not exceed 2 000 t in 2023.

Management objectives

No explicit management plan or management objectives have been defined by the Government of Greenland. Advice was drafted to be consistent with the NAFO precautionary approach (FC Doc 04-12).

Objective	*Status*	*Comment/consideration*
Apply Precautionary Approach		B_{lim} is defined as 30% of B_{msy}

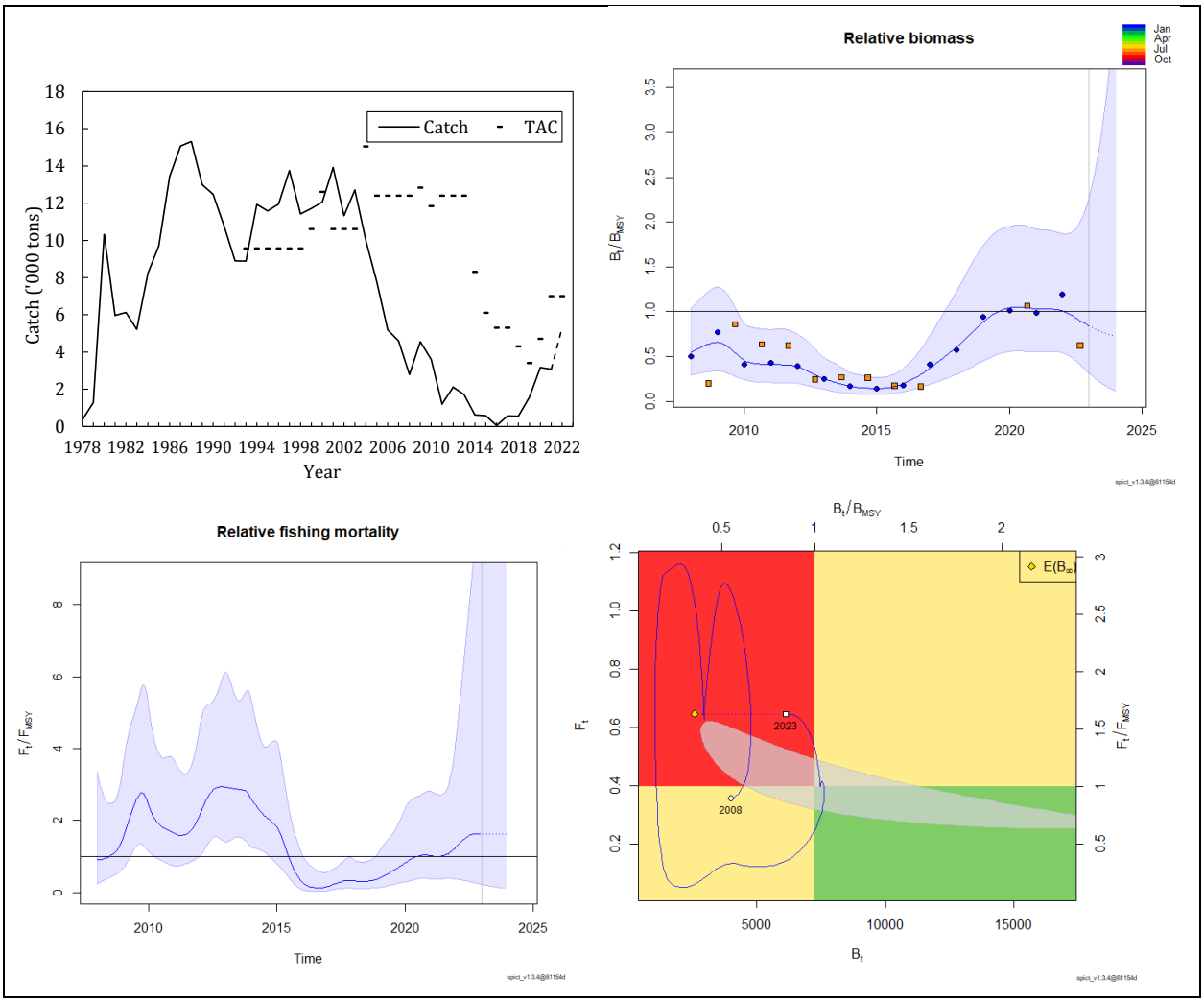
 OK

Management unit

The shrimp stock is distributed off East Greenland in ICES Div. 14b and 5a and is assessed as a single stock.

Stock status

Biomass is currently below B_{msy} (B/B_{msy} = 0.85). The probability of being below B_{lim} is currently 0.015. Fishing mortality is currently above F_{msy} (F/F_{msy} = 1.63). No estimates of recruitment are available.



Reference points

B_{lim} is 2 180 t which corresponds to 30% of B_{msy}. The SPiCT model uses relative reference points B/B_{msy} and F/F_{msy}. The current relative B/B_{msy} is 0.85 and the relative F/F_{msy} is 1.63. The probability of being below B_{lim} is currently 0.015.

Projections

Relative reference points are estimated for six catch options for 2023.

Catch (t)	B/B_{msy}	F/F_{msy}	Prob B > B_{msy}	Prob B < B_{lim}
1 500	1.03	0.56	0.52	0.01
2 000	0.96	0.77	0.47	0.03
2 500	0.89	1.01	0.43	0.06
3 000	0.81	1.26	0.40	0.10
3 500	0.74	1.54	0.37	0.16
4 000	0.66	1.86	0.34	0.22

Assessment

A comprehensive sensitivity analyses of the surplus production model in continuous time (SPiCT) was performed as recommended by NIPAG 2021 (SCR Doc 21/044). During the 2022 SC shrimp meeting an updated SPiCT model was presented and accepted as a valid assessment tool for this stock (SCR Doc. 22/051) based on a review of the model diagnostics.

The next assessment is scheduled for 2023.

Human impact
Mainly fishery related mortality has been documented. Other sources (e.g. pollution, shipping, oil-industry) are considered un-documented.

Biological and Environmental Interactions
Cod is an important predator on shrimp. The cod stock has fluctuated in East Greenland waters since 2014. The impact on the shrimp biomass is unknown.

Fishery

Shrimp is caught in a directed trawl fishery. The fishery is regulated by TAC and bycatch reduction measures include move-on rules and sorting grids.

Recent catches and TAC (t) were as follows:

	2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
Enacted TAC	12 400	8 300	6 100	5 300	5 300	4 300	3 384	4 750	7 000	6 850
SC Recommended TAC	12 400	2 000	2 000	2 000	2 000	2 000	2 000	3 000	3 000	3 000
NIPAG catch	1 717	622	576	49	561	547	1 580	3 172	3 067	5 295[1]

[1] To June 30

Effects of the fishery on the ecosystem

Measures to reduce effects of the fishery on the ecosystem include move-on rules to protect sponges and corals.

Source of Information

SCR Docs. 22/049, 22/050, 22/051, 21/044, FC Doc. 04-18