











b) Northern shrimp in Division 3LNO

Advice September 2023 for 2024-2025

RecommendationNo directed fishery in 2024 and 2025 as the stock is below B_{lim} with no indication of short-term recovery.**Management objectives**

No explicit management plan or management objectives have been defined by the Commission. Convention General Principles are applied. Advice is based on qualitative evaluation of biomass indices in relation to historic levels and provided in the context of the precautionary approach framework (FC Doc. 04/18).

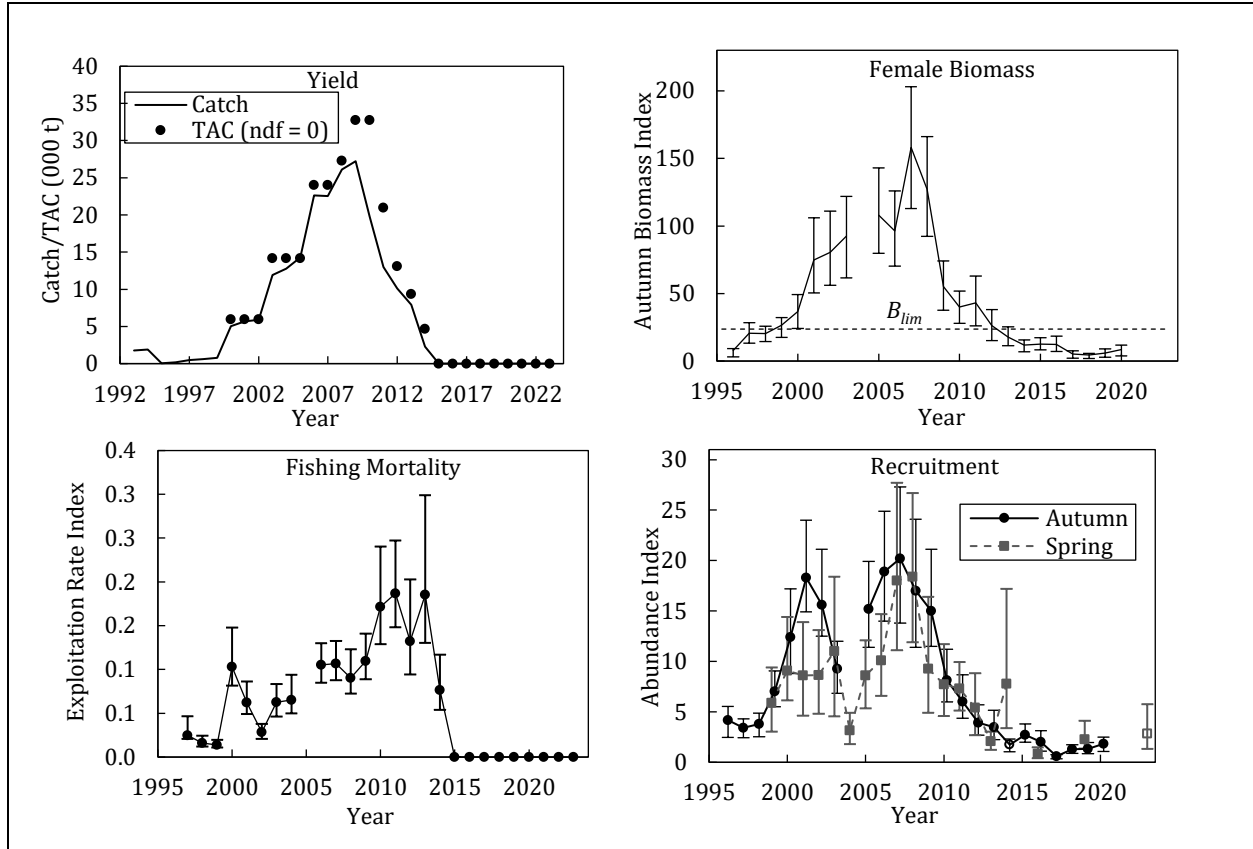
Convention Principle	Status	Comment	
Restore to or maintain at B_{msy}		$B < B_{lim}$	 OK
Eliminate Overfishing (Stock)		F_{lim} undefined, F level is not a concern	 Intermediate
Eliminate Overfishing (Ecosystem)		Total EPU catches $< 2TCI$	 Not accomplished
Apply Precautionary Approach		B_{lim} defined, F_{lim} undefined	 Unknown
Minimize harmful impacts on living marine resources and ecosystems		No directed fishing	
Preserve marine biodiversity		Cannot be evaluated	

Management Unit

The stock in Div. 3LNO is assessed and managed as a discrete population (see special comments).

Stock Status

Based on the autumn 2020 survey, the risk of the stock being below B_{lim} is greater than 95%. More recent biomass indices from other surveys show no indication of recovery. In addition, recruitment remains very low.



Reference points

Scientific Council considers that a female survey biomass index of 15% of its maximum observed level provides a proxy for B_{lim} (SCS Doc. 04/12).

Projections

Quantitative assessment of risk at various catch options is not possible for this stock at this time.

Assessment

Based upon a qualitative evaluation of trends in stock biomass, fishing mortality proxy and recruitment. Input data are research survey indices and fishery catches.

Next full assessment is planned for 2025.

Human impact

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

Biological and Environmental Interactions

The Grand Bank (3LNO) Ecosystem Production Unit (EPU) is currently experiencing low productivity conditions, with EPU biomass well below pre-collapse levels (pre-1990s). While some rebuilding was observed since the 1990s, biomass declined across multiple trophic levels and stocks after 2014, and has not yet returned to the early-mid 2010s level.

After reaching record-high conditions in 2010-2011 (warmest conditions since 1980), the bottom temperature in 3LNO had cooled down to near-normal conditions in 2014-2018 and a warming trend has been emerging since. Direct effects of temperature on shrimp distribution, recruitment, growth and survival are poorly understood.

Predation (by cod, Greenland halibut and redfish), low abundance of high energy prey (such as capelin) and environmental factors (including phytoplankton bloom dynamics) appear to be important drivers of the decline of northern shrimp in Divs. 2J3KL.

Ecosystem sustainability of catches

Shrimp is included in the benthivore guild of the Grand Bank (3LNO) EPU. Other NAFO managed stocks in this guild within the EPU include 3LNOPs thorny skate, 3NO witch flounder, 3LNO American plaice, and 3LNO Yellowtail flounder. The Catch/TCI is below the 2TCI ecosystem reference point (3LNO Benthivore Catch2022/TCI=0.80) indicating a low risk of ecosystem overfishing.

Fishery

The fishery, until 2014, was a directed bottom trawl fishery and there is little or no bycatch of shrimp in other trawl fisheries. The fishery in Div. 3LNO is regulated by quota.

Recent catches and TACs ('000 t) are as follows:

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
TAC ¹	4.7	ndf	Ndf	ndf	ndf	ndf	ndf	ndf	ndf	ndf
STATLANT 21	2.3	0	0	0	0	0	0	0	0	
NIPAG ²	2.3	0	0	0	0	0	0	0	0	

¹ Includes autonomous TAC as set by Denmark in respect of Faroes and Greenland.

² NIPAG catch estimates have been updated using various data sources (see p. 13, SCR. 14/048).

Effects of the fishery on the ecosystem

The fishery was closed to directed fishing beginning in 2015.

Special Comments

Shrimp in Div. 3LNO are genetically distinct from those in Div. 3M and the Gulf of Maine, but not from those further north. Work is ongoing to investigate the contribution of stocks north of Div. 3L to the production of Div. 3LNO shrimp.

Research on transport of larval shrimp indicates that most larvae that originate in Div. 3L are transported out of that division. Additionally, it was found that most recruitment in Div. 3L originates further north of the area. The results of this research have not yet been quantified in order to develop a more comprehensive recruitment index for Div. 3LNO.

Sources of information

SCR. 14/048, SCS Doc. 04/12