

## a) Northern shrimp in Division 3M

Advice September 2023 for 2024











**Recommendation**

The stock continues to be below  $B_{lim}$ .

To be consistent with the Precautionary Approach, Scientific Council advises that no directed fishery should occur in 2024.

**Management objectives**

No explicit management plan or management objectives 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).

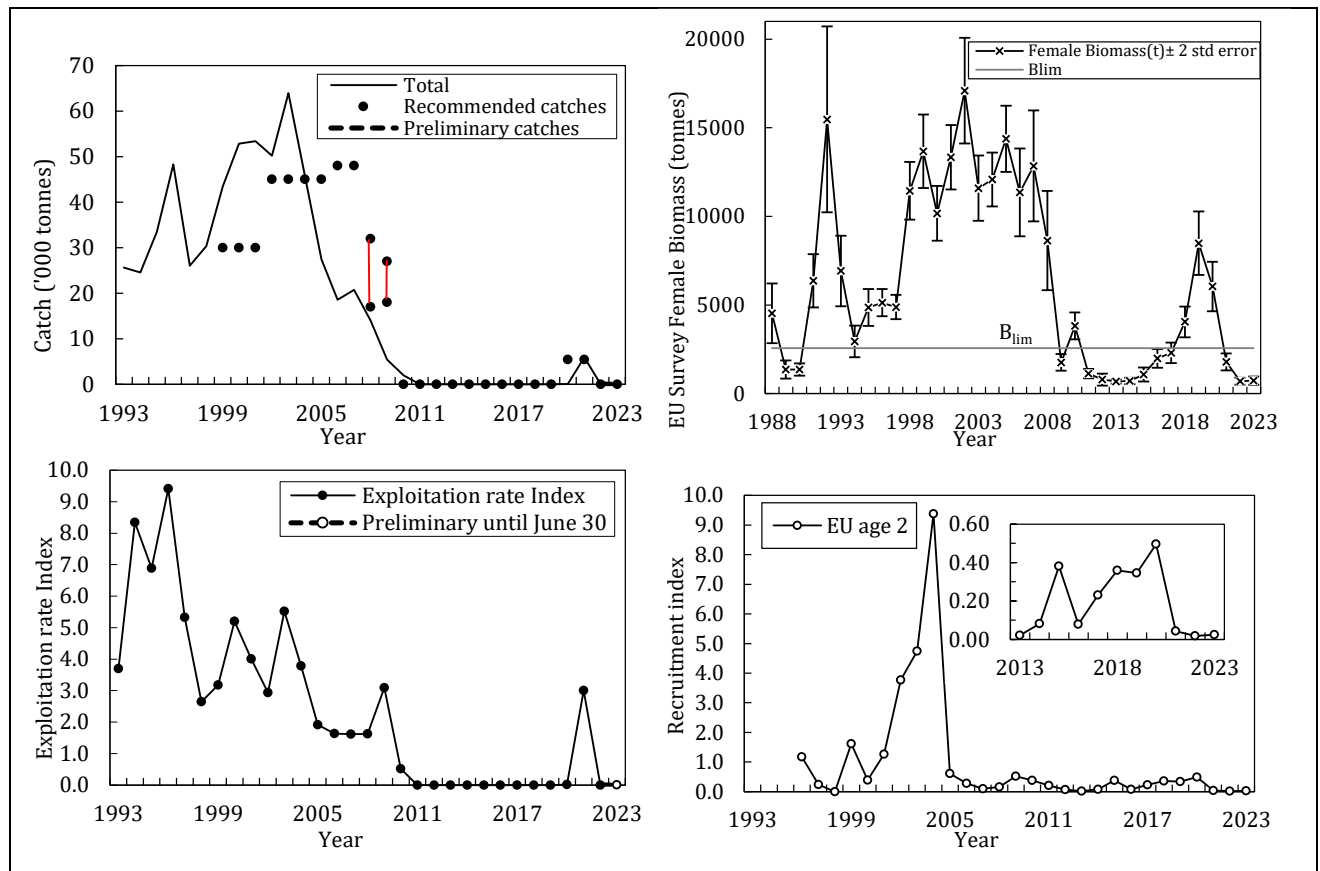
Convention Principle	Status	Comment	
Restore to or maintain at $B_{msy}$		$B < B_{lim}$	 OK
Eliminate Overfishing (Stock)		$F_{lim}$ undefined, F level is not a concern	 Intermediate
Eliminate Overfishing (Ecosystem)		Total EPU catches $< 2TCI$	 Not accomplished
Apply Precautionary Approach		$B_{lim}$ 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 northern shrimp stock on Flemish Cap is considered to be a separate population.

**Stock status**

Since 2021 the biomass has been below  $B_{lim}$ . Recruitment since 2021 has been the lowest of the historical series.



### 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). This corresponds to an index value of 2 564 t. A limit reference point for fishing mortality has not been defined.

### Projections

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

### Assessment

No analytical assessment is available. Evaluation of stock status is based upon fishery and research survey data.

The next assessment will take place prior to the NAFO Annual Meeting in September 2024.

#### Human impact

Mainly fishery related mortality and low bycatch in other fisheries. Other sources (e.g. pollution, shipping, oil-industry) are un-documented.

#### Biological and Environmental Interactions

Multispecies models (SCR Docs. 16/35 and 18/24), suggest that predation by cod (*Gadus morhua*) and redfish (*Sebastes* sp.), together with fishing, were the main factors driving the shrimp stock to the collapse after 2007.

Results of modelling suggest that, in unexploited conditions, cod and redfish would be expected to be a highly dominant component of the system, and high shrimp stock sizes like the ones observed in the 1998 – 2007 period would not be a stable feature in the Flemish Cap. It is uncertain whether this represents a causal relationship and/or covariance as a result of some environmental factor.

The Flemish Cap (3M) Ecosystem Production Unit (EPU) has not experienced sustained reductions in overall productivity observed in other EPUs. With the exception of a short-lived increase in 2005-2009, total EPU biomass has remained fairly stable over time despite the changes in individual stocks.

#### *Ecosystem sustainability of catches*

The impact of bottom fishing activities on Vulnerable Marine Ecosystems (VMEs) in the NRA was last assessed in 2021. The risk of Significant Adverse Impacts (SAIs) on sponge and large gorgonian VMEs was assessed to be low, while this risk for sea pen VMEs has been assessed as intermediate. The risks of SAIs on small gorgonian, black coral, bryozoan and sea squirt VMEs were assessed as high. A number of areas in the Flemish Cap (3M) EPU have been closed to bottom fishing to protect VMEs

#### **Fishery**

This fishery is effort-regulated. A moratorium was imposed in 2011. The fishery was reopened in 2020. Fishing effort and catches were very low in 2020 but increased in 2021. With the new moratorium established in 2022 the catch in that year was zero and is expected to be at the same level in 2023.

Recent catches ('000 t) and agreed effort by the NAFO Commission were as follows:

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
NIPAG	0	0	0	0	0	0	0.1	5.7 <sup>3</sup>	0	N/A
STATLANT 21	0	0	0	0	0	0	0.0	5.9	N/A	N/A
Effort <sup>2</sup> (Agreed Days)	0	0	0	0	0	0	2.6	2.6	ndf	ndf
Effort days used	0	0	0	0	0	0	0.0	0.5	0	0 <sup>1</sup>
SC Recommended Catches (tonnes)	ndf	ndf	ndf	ndf	ndf	ndf	5.4	5.4	0	0

<sup>1</sup> preliminary until 30 June

<sup>2</sup> effort regulated

<sup>3</sup> CESAG method

#### **Effects of the fishery on the ecosystem**

The fishery was closed to directed fishing from 2011 to 2019 and since 2022.

#### **Special comments**

SC **recommended** that *the management of 3M shrimp be converted from the existing "effort regulation" to "catch regulation" in line with all other stocks in the NAFO Regulatory Area.*

#### **Source of Information**

SCR Docs. 16/035; 18/024; SCS Doc. 04/12; FC Doc. 04/18