Scientific Council responded:

Available data indicate that biomass is at or below the long-term mean. The stock appears to be above the interim limit reference point (B_{lim}). In the absence of Canadian spring surveys in 2020 and 2021 proxy fishing mortality cannot be determined for those years. However, it is unlikely that levels of fishing mortality have changed substantially. Recruitment has been below the long-term average since the mid-2010s.

Scientific Council advises that catches should not exceed their current level of 11 500 t (the mean of the last 5 years).

Convention General Principles	*Status*	*Comment/consideration*
Restore or maintain at B_{MSY}	○	Status relative to B_{MSY} is unknown.
Eliminate overfishing	○	Estimates of proxy F are not available in recent years.
Apply Precautionary Approach	●	B_{lim} defined
Minimize harmful impacts on living marine resources and ecosystems	●	VME closures in effect, no specific measures
Preserve marine biodiversity	○	Cannot be evaluated

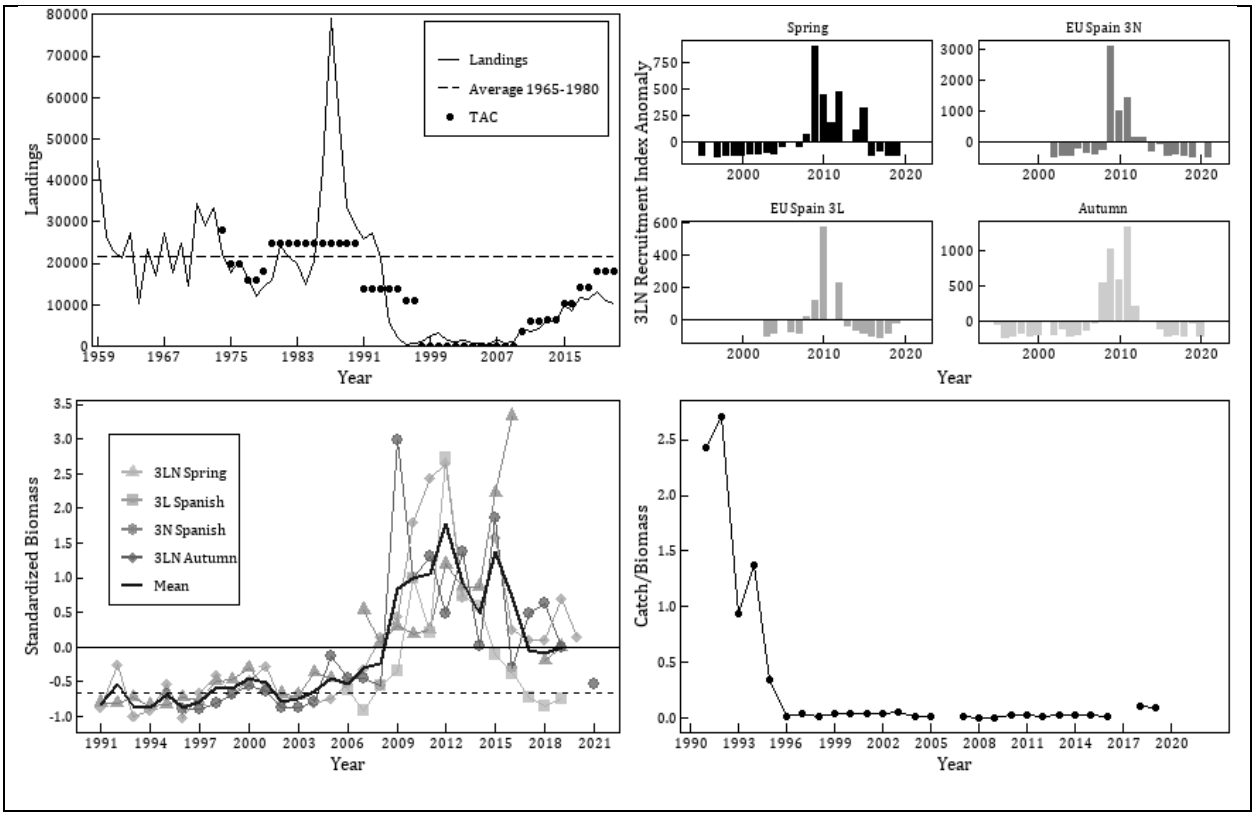
● OK
● Intermediate
● Not accomplished
○ Unknown

Management unit

The management unit is defined as NAFO Divs. 3LN.

Stock status

Lack of survey indices in recent years limits our understanding of stock status since 2019, but available data indicate that biomass is at or below the long-term mean. The stock appears to be above the interim limit reference point (B_{lim}). Recruitment of redfish between 15 and 20 cm has been below the long-term average since the mid-2010s across Canadian 3LN spring and autumn as well as EU-Spain 3L and 3N survey series.



Reference points

An interim limit reference point was adopted for use while the MSE process is ongoing, based on the average of the mean standardized biomass of the Canadian spring and autumn 3LN and EU-Spain 3N surveys ($B_{lim}=B_{rec}$) from the period 1991-2005.

Assessment

The previous assessment model (ASPIC) was rejected at the 2022 assessment. Continued mismatch between recent observed survey indices and the ASPIC model biomass estimates resulted in a lack of confidence in the model. This assessment is based on an examination of an aggregate survey series including EU-Spain 3L and 3N surveys and Canadian 3LN spring and autumn surveys, as well as landings. The next assessment is scheduled for 2024.

The ASPIC model has continued to show patterning in residuals of input series and the use of a fixed MSY approach has resulted in an value of r that is considered too high for this species (>0.2).

Work is ongoing to develop an MSE for this stock.

Human impact

Mainly fishery related mortality has been documented. Mortality from other human sources (e.g. pollution, shipping, oil-industry) are undocumented.

Biology and Environmental interactions

There are two species of the genus *Sebastes* with distribution overlapping in several areas of Northwest Atlantic, namely on the Gulf of St. Lawrence, Laurentian Channel, off Newfoundland and south of Labrador Sea: the deep sea redfish (*Sebastes mentella*), with a maximum abundance at depths greater than 350m, and Acadian redfish (*Sebastes fasciatus*), preferring shallower waters of less than 300m.

Redfish diet varies across life history stages as juvenile redfish primarily eat crustaceans such as shrimp and adult redfish consume more fish.

The Grand Bank (3LNO) EPU continues to experience low overall productivity conditions, and total biomass remains well below pre-collapse levels. However, recent warming, earlier phytoplankton spring bloom, and an increase in the proportion of energy-rich copepod species may have positive effects on total ecosystem production in the coming years.

Fishery

Landings of this stock are primarily from directed fisheries. Following evaluation in the MSE, a stepwise harvest control rule (HCR) was adopted for this stock in 2014. Since then the TAC has increased in a steps from 6500 tonnes to 18100 tonnes, the maximum level evaluated for the HCR at the MSE. However, the HCR lacks feedback between the stock biomass levels and the TAC recommendation. Given recent missing surveys and recent downward trends in available survey indices, it is unclear if the TAC of 18100 is sustainable for the stock. Landings have also generally been increasing as per Scientific Council advice on TAC, but since 2016 landings have remained below the established TAC.

Recent catch estimates and TACs ('000 tonnes) are:

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
TAC	6.0	6.5	6.5	10.4	10.4	14.2	14.2	18.1	18.1	18.1	18.1
STACFIS catch	4.3	6.2	5.7	9.9	8.5	11.8	11.3	13.1	11.1	10.2	
STATLANT	4.3	6.2	5.7	10.2	8.5	11.8	11.3	13.1	11.7	11.8	

Effects of fishery on the ecosystem

No specific information is available. General impacts of fishing gears on the ecosystem should be considered.

The impact of bottom fishing activities on major 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. This assessment of impacts of bottom fishing activities on VMEs does not include waters within coastal states jurisdictions. Within the Grand Bank (3LNO) EPU areas in Div. 3O and 3L have been closed to fishing to protect corals.

Special comments

Redfish are known to have variable and episodic recruitment, with potentially large periods of time between recruitment pulses and no strong relationships between stock size and recruitment. Impacts of delineations of stock boundaries and synchronicity between adjacent stocks are unknown. Work is ongoing to develop an MSE for this stock.

Sources of information

SCR Docs. 22/013; 22/007; 22/005; 20/014; SCS Docs. 22/06; 22/07; 22/09; 22/13