

Cod in Divisions 3NO






Advice June 2021 for 2022 - 2024





Recommendation for 2022 – 2024

No directed fishing in 2022 to 2024 to allow for stock rebuilding. Bycatch of cod in fisheries targeting other species should be kept at the lowest possible level. Projections of the stock were not performed but given the poor strength of all year-classes subsequent to 2006, the stock will not reach B_{lim} in the next three years.

Management objectives

General Convention Principles are applied in conjunction with an Interim Conservation Plan and Rebuilding Strategy adopted in 2011 (NAFO/FC Doc. 11/22). The long-term objective of this plan is to achieve and to maintain the spawning stock biomass in the “safe zone” of the NAFO PA framework (FC Doc. 04/18), and at or near B_{msy} .

<i>Convention objectives</i>	<i>Status</i>	<i>Comment/consideration</i>
Restore to or maintain at B_{msy}		$B < B_{lim}$
Eliminate overfishing		F is very low, $F < F_{lim}$
Apply Precautionary Approach		B_{lim} and F_{lim} established, no directed fishery.
Minimise harmful impacts on living marine resources and ecosystems		No directed fishery
Preserve marine biodiversity		Cannot be evaluated

-  OK
-  Intermediate
-  Not accomplished
-  Unknown

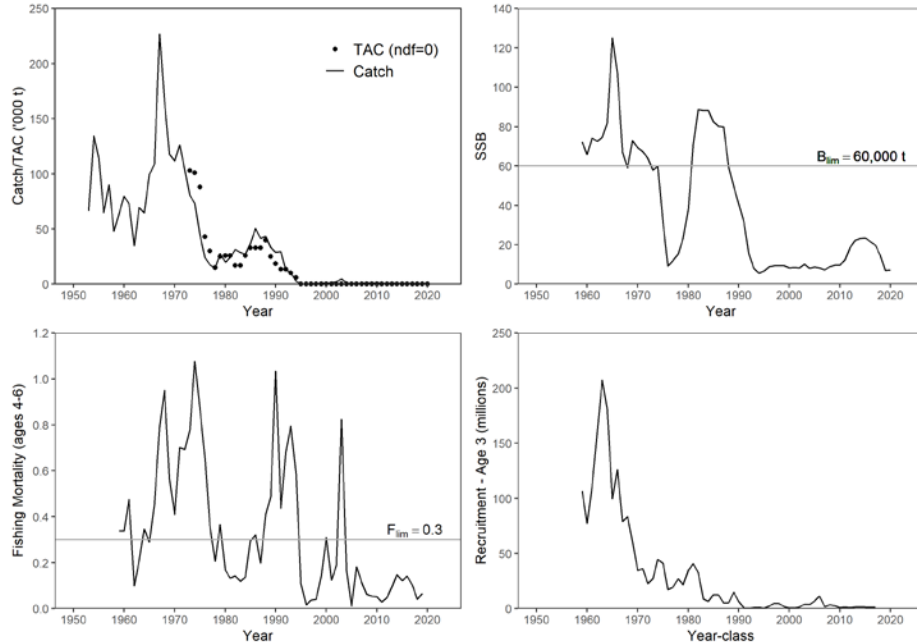
Management unit

The stock occurs in Divs. 3NO, with fish occupying shallow parts of the bank, particularly the southeast shoal area (Div. 3N) in summer and on the slopes of the bank in winter.

Stock status

The spawning biomass increased noticeably between 2010 and 2015 but has subsequently declined sharply and the 2020 estimate of 7279 t represents only 12% of B_{lim} (60,000 t). The relatively strong 2006 year-class left the population after 2018, which had some influence on the most recent SSB estimates but did not influence overall stock status. Subsequent year-classes are much weaker, suggesting that the medium-term prospects for the stock are not good. Fishing mortality values over the past decade have been low and well below F_{lim} (0.3). Lack of catch-at-age data in 2020 prevented the estimation of stock size for 2021, however it should not be markedly different than the 2020 estimate.





Reference points

B_{lim} : 60 000 t of spawning biomass (SC, 1999).

F_{lim} ($=F_{msy}$): 0.3 (SC, 2011).

Projections

Although projections of the stock were not performed because of various limitations identified with the assessment model, the poor strength of year-classes subsequent to 2006 suggests that the medium-term prospects for the stock are not good.

Assessment

A virtual population analysis model was used, and the results were consistent with the previous assessment. Input data comes from research surveys and commercial removals.

The next assessment is planned for 2024.

Human impact

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

Biology and Environmental interactions

Productivity of this stock was above average during the warm 1960s. During the cold 1990s, productivity was very low and surplus production was near zero. The Grand Bank (3LNO) Ecosystem Production Unit is currently experiencing low productivity conditions and biomass has declined across multiple trophic levels and stocks since 2014.

Fishery

A moratorium was implemented in 1994. Catches since that time are bycatch in other fisheries.

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

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
TAC	ndf	ndf	ndf	ndf	ndf	ndf	ndf	ndf	ndf	ndf
STATLANT 21	0.7	1.1	0.7	0.5	0.6	0.6	0.3	0.5	0.3*	
STACFIS	0.7	1.1	0.7	0.6	0.7	0.6	0.4	0.5	0.6	

ndf: No directed fishery

*provisional

Effects of the fishery on the ecosystem

No specific information is available. There is no directed fishery for this stock. General impacts of fishing gears on the ecosystem should be considered. Areas of Divs. 3LNO have been closed to protect sponges and corals.

Special comments

The assessment model was accepted for stock status purposes, but a decision was made to not project the stock forward because of the limited age range (ages 2-12) considered in the model, as well as potential diagnostic issues (including directional retrospective patterns, trends in residuals in recent years). Limitations of the current assessment model suggest a need to explore more flexible models capable of dealing with uncertainty in model inputs (e.g., catch-at-age) and that do not impose assumptions about stationary natural mortality.

Sources of information

SCR Docs. 21/04; SCS Docs. 21/05, 06, 08, 09, 10, 13.