



# STOCK STATUS UPDATE OF ATLANTIC COD (*GADUS MORHUA*) IN THE NORTHERN GULF OF ST. LAWRENCE (3PN, 4RS) IN 2025

## CONTEXT

Fisheries and Oceans Canada's (DFO) Fisheries Management Branch has requested an update of the indicator for the northern Gulf of St. Lawrence Atlantic cod stock (Northwest Atlantic Fisheries Organization [NAFO] Subdivision 3Pn and Divisions 4R and 4S). This stock is part of the major stocks covered by the fish stocks provisions of the Fisheries Act and is the subject of a rebuilding plan (DFO 2024a).

The rebuilding plan, completed in 2024, stipulates that a full stock assessment will be carried out every four years, with updates in the interim years. The last full assessment was conducted in 2025 (DFO 2025). The objective of this update is to provide annual monitoring of the main indicator of stock status, namely the spawning stock biomass (SSB).

This Fisheries Science Response Report is from the regional peer review of February 2, 2026, on the Stock Status Update of Atlantic Cod (*Gadus morhua*) in the Northern Gulf of St. Lawrence (3Pn, 4RS) in 2025.

## SCIENCE ADVICE

### Status

- The stock has been in the critical zone of the Precautionary Approach (PA) since 1990, and the SSB indicator is estimated in 2025 at 30% of the Limit Reference Point (LRP), compared to 19% in 2024.

### Trends

- SSB has fluctuated without a clear trend since the late 1990s, but starting in 2017, the trend has generally been downward. In 2024, the SSB estimate (15,793 t) reached, according to the assessment model, the lowest value in the series starting in 1973. In 2025, the assessment model was not updated, and the SSB estimate based on the SSB indicator is 21,693 t.

### Ecosystem and Climate Change Considerations

- Ecosystem and climate change considerations were taken into account in the most recent stock assessment and were not further updated or reviewed during this interim-year update.

### Stock Advice

- The SSB indicator estimated in 2025 corresponds to 30% of the PA LRP. According to the harvest control rule (HCR) in the rebuilding plan, annual removals from all sources should not exceed 500 t.

- A full reassessment of the stock is not warranted, and the conclusions of the last scientific advisory report remain applicable. The next full assessment is scheduled for winter 2029.

## **BASIS FOR ASSESSMENT**

### **Assessment Details**

#### **Year Assessment Approach was Approved**

This assessment follows the framework developed during the 2021 and 2022 review of the 3Pn4RS cod stock assessment framework (Benoît et al. 2021, 2022, 2024, 2025; Ouellette-Plante et al. 2022b, 2022a).

#### **Assessment Type**

Interim-Year Update

#### **Most Recent Assessment Date**

1. Last Full Assessment: February 2025 (Ouellette-Plante et al. 2026; DFO 2025)
2. Last Interim-Year Update: January 2024 (DFO 2024b)

#### **Stock Assessment Approach**

1. Broad category: Single stock assessment model
2. Specific category: Statistical catch-at-age model (state-space model)

The assessment model is not updated for interim year stock status updates. Instead, the smoothed biomass index of cod  $\geq 43$  cm from the August ecosystemic survey in the Estuary and northern Gulf of St. Lawrence (hereafter nGSL survey) is used as SSB indicator.

### **Stock Structure Assumption**

Results from a genomic population study show that cod in the Gulf of St. Lawrence (GSL) are partially distinct from adjacent populations on the Scotian Shelf and Newfoundland/Labrador/Arctic (Puncher et al. 2021). These results suggest reduced genetic connectivity, or little reproduction, between GSL cod and those outside. However, these results do not show a distinction between northern GSL cod (Divisions 3Pn4RS) and southern GSL cod (Divisions 4T + 4Vn [November to April]), whereas other studies using otolith trace element composition (Campana et al. 1999) or tagging (Bérubé and Fréchet 2001) point to geographic isolation between these two stocks.

The results of several tagging studies show that the 3Pn4RS stock is fairly well isolated from the peripheral stocks. Except for subdivision 3Ps, in which recaptures of cod tagged in 3Pn4RS are relatively frequent, recaptures elsewhere outside of 3Pn4RS are rare (Bérubé and Fréchet 2001).

### **Reference Points**

- Limit Reference Point (LRP): 71,970 t of SSB (DFO 2023)
- Upper Stock Reference (USR, proposed): 143,939 t of SSB (DFO 2023)
- Target Reference Point (TRP, proposed): 179,924 t of SSB (DFO 2023)
- Removal Reference (Flim, proposed): 0.49 (DFO 2023)

### Harvest Control Rule

The rebuilding plan for this stock (DFO 2024a) includes a HCR intended to promote stock growth towards the rebuilding target, set at a SSB of 81,961 t. The HCR recommends the maximum harvest level for 3Pn4RS cod from all fishery-related sources based on the value of SSB relative to the LRP (Table 1).

*Table 1. Maximum removals prescribed under the recovery plan according to the SSB relative to the LRP (% of LRP).*

SSB relative to LRP (% LRP)	Maximum removals (t)
< 25	500
26-49	500
50-59	500
60-69	500
70-79	500
80-89	1,000
90-99	1,500
100-113	2,000

### Data

- Assessment model outputs from the February 2025 assessment (DFO 2025)
- Commercial landings (ZIFF, 2024–2025)
- nGSL survey (1992–2025)

### ASSESSMENT

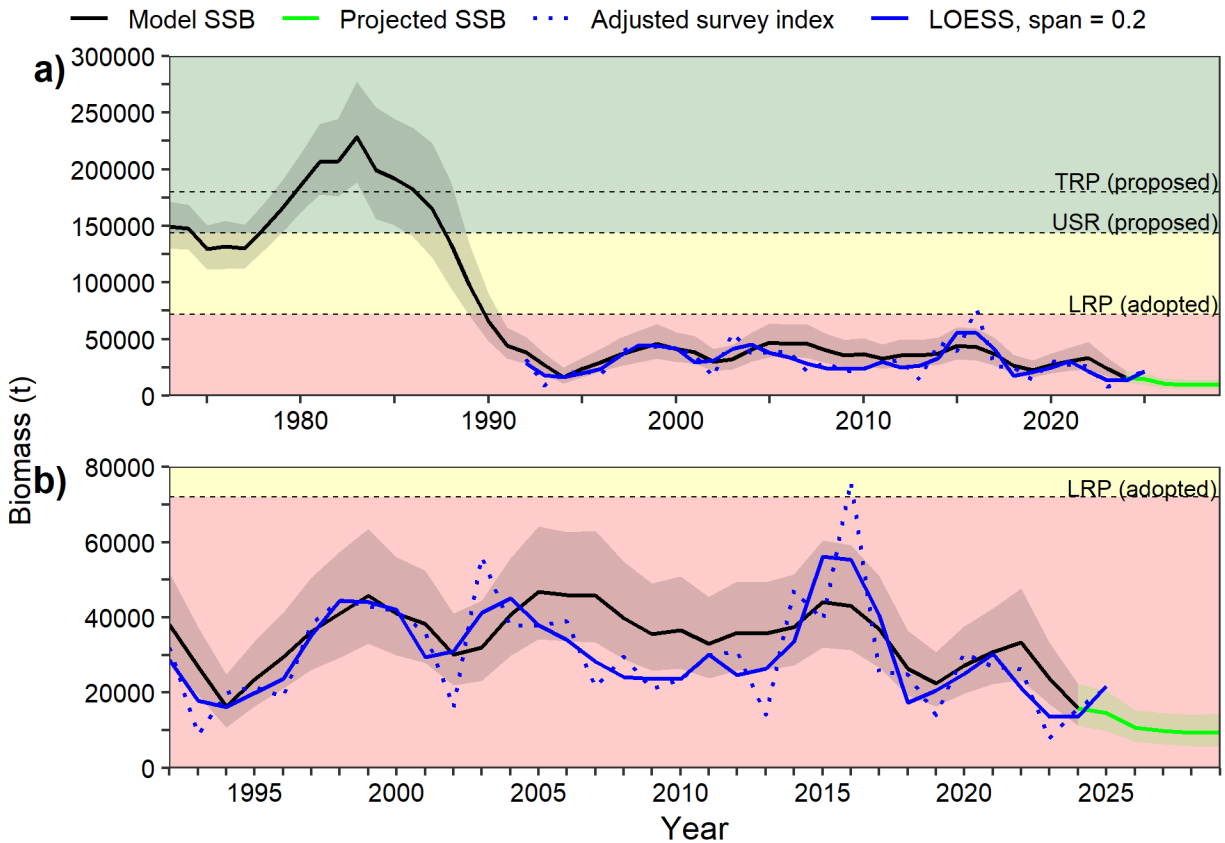


Figure 1. (A) Spawning stock biomass (SSB; black line with 95% confidence interval) estimated from the assessment model (February 2025) with projections under a total removal scenario of 500 t (green line with 95% confidence interval), adjusted biomass index from the nGSL survey for cod  $\geq 43$  cm (dotted blue line), and LOESS smoothing of the adjusted index (solid blue line). (B) Focus on the 1992–2029 period. The red, yellow, and green background areas represent the critical, cautious, and healthy zones of the precautionary approach, respectively.

### Stock Status and Trends

#### Biomass

SSB has fluctuated without a clear trend since the late 1990s, but starting in 2017, the trend has generally been downward (Figure 1). In 2024, the SSB estimate (15,793 t) reached, according to the assessment model, the lowest value in the series starting in 1973. In 2025, the assessment model was not updated, and the SSB estimate based on the SSB indicator is 21,693 t.

#### Current Status

The stock status remains relatively the same as during the last assessment. The stock has been in the critical zone of the PA since 1990, and the SSB indicator is estimated to be at 30% of the LRP in 2025, compared to 19% in 2024.

## Fishing history

Although a moratorium on directed commercial fishing has been in effect since 2022, allocations totaling 503 t are currently planned to account for catches of 3Pn4RS cod in food, social, and ceremonial fisheries (53 t), scientific fisheries (150 t), recreational fisheries (150 t), and commercial fisheries targeting other species (150 t, DFO 2024a). Reported landings for 2024–2025 and 2025–2026, including bycatch from fisheries directed at other species and landings from sentinel surveys, were 139 and 84 t, respectively (preliminary data as of December 2, 2025).

In 2025, recreational fishing for 3Pn4RS cod was initially authorized with a 39-day season spread from late June to late September. For area 3Pn4R, an [extension of the fishing season](#) with two additional weekends in September was granted to account for wildfires and challenging sea conditions significantly limiting many people’s ability to participate in this fishery. Although there is regulatory monitoring of compliance with the authorized daily quotas, no monitoring of catches and discards (e.g., length frequencies, landed weights) is carried out. With the closure of directed commercial cod fishery since 2022, the assumed removals from the recreational fishery would now be higher than the reported catches.

## Stock Advice

At the last assessment (DFO 2025), four-year projections (2025-2028) from the fitted assessment model were made for three catch scenarios (0, 500 and 1,000 t) defined by Fisheries Management. Under these scenarios, the probability of an increase in SSB over four years ranged from 0.0396 (0 t) to 0.0128 (1,000 t, Table 2). The very low probabilities of an increase in the biomass and abundance of adult cod reflected the high estimated natural mortality. The projections and stock advice from the last assessment remain appropriate considering the current state of the stock.

Table 2. Results of 4-year projections from the February 2025 assessment model under different catch scenarios, based on 10,000 simulations.

	Probability	0 t	500 t	1000 t
... of any increase of SSB	0.0396	0.0252	0.0128	
... of a > 10% increase in SSB	0.0167	0.0114	0.0050	
... of reaching or exceeding LRP	0.0000	0.0000	0.0000	
... of any increase in ages 5+ abundance	0.4774	0.4383	0.3789	
... of a > 10% increase in ages 5+ abundance	0.3619	0.3232	0.2683	

## Harvest Decision Rule

The SSB indicator in 2025 corresponds to 30% of the PA LRP. According to the HCR in the rebuilding plan (Table 1), annual removals from all sources should not exceed 500 t.

## SOURCES OF UNCERTAINTY

The magnitude of the recreational fishery, for which no monitoring of catches (quantities, sizes and weights) and discards is carried out, is uncertain (Ouellette-Plante et al. 2022a). As the directed commercial fishery has been closed since 2022, it is likely that removals from recreational fishing currently constitute a significant portion of total 3Pn4RS cod removals. Unaccounted mortality resulting from the recreational fishery may contribute to high values of natural mortality estimated by the assessment model.

As indicated in Ouellette-Plante et al. (2025), the reliability of the smoothed biomass index for cod  $\geq 43$  cm from the nGSL survey as a proxy for SSB must be reviewed periodically, particularly if there are notable increases in SSB. Since the SSB indicator has remained at low values in recent years, it is unlikely that actual SSB levels exceed 80% of the LRP, the level that would allow for an increase in maximum removals, in accordance with the HCR adopted in the rebuilding plan (Table 1).

## LIST OF MEETING PARTICIPANTS

Name	Affiliation
Beaudry-Sylvestre, Manuelle	DFO, Science, Quebec Region
Benoît, Hugues	DFO, Science, Quebec Region
Bourdages, Hugo	DFO, Science, Quebec Region
Chamberland, Jean-Martin	DFO, Science, Quebec Region
Chlebak, Ryan	DFO, Science, NCR Region
Cyr, Charley	DFO, Science, Quebec Region
Hardy, Magalie	DFO, Resource management, Quebec Region
Hawkins, Laurie	DFO, Resource management, Newfoundland and Labrador Region
Labbé-Giguère, Stéphanie	DFO, Resource management, Quebec Region
Lussier, Jean-François	DFO, Science, Quebec Region
Ouellette-Plante, Jordan	DFO, Science, Quebec Region
Parent, Geneviève	DFO, Science, Quebec Region
Pond, Nancy	DFO, Resource management, Newfoundland and Labrador Region
Senay, Caroline	DFO, Science, Quebec Region
Trottier, Steve	DFO, Resource management, Quebec Region

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Center for Science Advice (CSA)  
Quebec Region  
Fisheries and Oceans Canada  
Maurice-Lamontagne Institute  
C.P. 1000  
Mont-Joli (Quebec)  
Canada G5H 3Z4

E-Mail: [dfo.csaquebec-quebeccas.mpo@dfo-mpo.gc.ca](mailto:dfo.csaquebec-quebeccas.mpo@dfo-mpo.gc.ca)

Internet address: [www.dfo-mpo.gc.ca/csas-sccs/](http://www.dfo-mpo.gc.ca/csas-sccs/)

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