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Catch levels for the scoping of the ecosystem sustainability of catches in 2025-2026

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Abstract

The Roadmap is the framework that NAFO is implementing to deliver an ecosystem approach for the management of NAFO fisheries and ecosystems. One element of the Roadmap is the evaluation of the ecosystem sustainability of catches. This involves the comparison of total catches by functional guild at the ecosystem level, with a corresponding Ecosystem Reference Point. The reference point has been defined as twice the Total Catch Index (2TCI), above which total catches are associated with a high risk of ecosystem overfishing. To use this analysis to inform incoming management decisions on harvesting levels, it is necessary to evaluate how the total future catches would compare with 2TCI, if the scientific advice provided were to be followed. This scoping exercise requires approximating what the incoming catches would be expected to be under already approved quotas for the current year (i.e. ongoing fishing at the time of analysis), and under the maximum catches that are consistent with approved quotas for the following year (i.e. fisheries with multi-year advice) or the scientific advice being provided for decisions on the following year fisheries. This analysis summarizes the procedure used and the results obtained for approximating the 2025 and 2026 catches in the Grand Bank (3LNO) and Flemish Cap (3M) Ecosystem Production Units (EPUs) based on recent catches, already approved fishing quotas by NAFO and coastal states, and the NAFO Scientific Council (SC) advice provided in 2025.

Introduction

The Roadmap is the framework that NAFO is implementing to deliver an ecosystem approach for the management of NAFO fisheries and ecosystems (Koen-Alonso et al., 2019). Within the Roadmap, sustainability of fisheries catches is achieved through a nested series of assessment aimed at evaluating sustainability at different levels of ecological organization. Within these assessments, Tier 1 is focused at sustainability at the ecosystem level, Tier 2 is focused on sustainability at the multispecies level (e.g. species interactions), and Tier 3 is focused on sustainability at the stock level (i.e. traditional stock-assessment) (Koen-Alonso et al., 2019).

The current implementation of Tier 1 includes two distinct elements, a) the evaluation of the sustainability of total catches by functional guild at the Ecosystem Production Unit (EPU) spatial scale, and b) the production of Ecosystem Summary Sheets (ESSs) to provide a synoptic view on the ecological state of EPU and the general performance of the management measures within the ecosystem unit (NAFO, 2022b; NAFO, 2023).

The evaluation of the ecological sustainability of total catches relies on comparing the total catch by functional guild with the corresponding Ecosystem Reference Point adopted by NAFO and defined as twice the estimated Total Catch Index (2TCI) (Koen-Alonso et al., 2022; NAFO, 2022a; NAFO, 2022b). Total catches above this Ecosystem Reference Point correspond to a high risk of Ecosystem Overfishing (Koen-Alonso et al., 2022; NAFO, 2022b).

Informing on the likely risk of ecosystem overfishing of upcoming Total Allowable Catch (TAC) decisions by the NAFO Commission requires integrating the existing TAC decisions with the SC advice being provided to support those upcoming decisions into forward looking analyses of the ecosystem sustainability of catches. Conducting these analyses requires information on the expected total catches for the upcoming years under the already existing and soon to be made TAC decisions.

While predicting future catches and resulting Catch/TCI Ratios is not straightforward, it is possible to provide a simple scoping of these catches. This is done based on standing TAC decisions, levels and distribution of catch in the most recent years, and assuming that incoming management decisions will follow the SC stock advice. This scoping would constitute a simple approximation to the order of magnitude of the current and near future catches, and can be used to provide reasonable values for the expected catch levels against the 2TCI Ecosystem Reference Point. This approach was first implemented in 2024 and applied to the scoping of 2024-2025 catches (Koen-Alonso and Munro, 2024).

The objective of this document is to summarize the process used to develop the approximation of catches to be used by SC for the scoping of the ecosystem sustainability of catches in 2025-2026 for the Grand Bank (3LNO) and Flemish Cap (3M) EPUs.

Material and Methods

The approximation of catches followed the general protocol adopted by Scientific Council (SC) for producing this scoping of catches (Table 1) (NAFO, 2024c). This protocol was adopted by SC.

Table 1. Schematic considerations for the compilation of catch information and their use for a scoping exercise done in year t for catch levels expected in year t (current year) and t+1 (year to come).

1. Stocks assessed by SC:
    a. Catch: current TAC (or recent maximum catch if deemed appropriate) for year t, and maximum catch advice recommended by SC for year t+1, noting that this catch advice needs to be done solely considering the stock assessment and without influence by TCI information.
    b. Stock area: if the stock area expands beyond the EPU, the catch should be allocated to the EPU based on the fraction of the total catch for the stock that was taken in the EPU in the year t-1 (the latest full year for which information is available).
2. Stocks without assessment or catch advice:
    a. Catch: Level observed in the EPU in year t-1 (the latest full year for which information is available).
    b. Stock area: not applicable.
3. Stocks assessed by Coastal State:
    a. Catch: Current quota decision (or recent maximum catch if deemed appropriate) for year t, and maximum catch advice from the relevant authority for year t+1. If only the quota decision for year t is available, the quota decision should be assumed for year t+1. If the quota decision for year t and the catch advice for year t+1 are not available at the time of the scoping exercise, the level of catch observed in the EPU in year t-1 should be used instead.
    b. Stock area: if the stock area expands beyond the EPU, the catch should be allocated to the EPU based on the fraction of the total catch for the stock that was taken in the EPU in the year t-1 (the latest full year for which information is available). If the quota decision for year t and catch advice for year t+1 are not available at the time of the scoping exercise, the use of level of catch observed in the EPU in year t-1 makes stock area scaling unnecessary.

In 2024 NAFO adopted a new Precautionary Approach (PA) framework, which includes the provision of a range of catch options when the stock is assessed to be in the Cautious or Healthy zones (NAFO, 2024a; NAFO, 2024b). As the new PA gets gradually implemented across NAFO-managed stocks, the maximum catch advice recommended by SC (Table 1) to be used in the scoping exercise would increasingly correspond to the upper end of the range when the stock is in the Cautious zone, and the target fishing mortality when the stock is in the Healthy zone. For those stocks managed using Management Strategy Evaluation (MSE), the maximum catch advice would correspond to the values produced by the corresponding management procedure (MP).

Information of catches and NAFO quotas was obtained from the NAFO Secretariat and includes a compilation and curation of the best available information at the time of analysis, including STATLAN21A database (https://www.nafo.int/Data/STATLANT-21A), and catch estimates produced by the NAFO Joint Commission-Scientific Council Catch Estimation Strategy Advisory Group (CESAG). Data on quotas for Canadian-managed stocks were obtained from publicly available information in the Fisheries and Oceans Canada website (https://www.dfo-mpo.gc.ca/fisheries-peches/decisions/fm-2025-gp/index-atl-eng.html#d2025 and links within).

Results

The results from the approximation of the 2025 and 2026 catches for the scoping exercise on the ecological sustainability of catches is provided in Table 2.

Table 2. Catch for 2024, fishing quotas information for 2023-2025, and approximated catches for 2024 and 2025 for the scoping of the ecosystem sustainability of catches in the Grand Bank (3LNO) and Flemish Cap (3M) Ecosystem Production Units. All catches are in t. NDF indicates "No Directed Fishing". Some managed and non-managed stocks may be grouped under "Others" if their catches in recent years have been low.

	Catch (t)	**Approximated Catch (t)**		**Total Allowable Catch (TAC) or Quota (t)**			
	2024	**2025**	**2026**	**2024**	**2025**	**2026**	**Notes**
Grand Bank (3LNO) EPU							
American plaice	376	376	376	NDF	NDF	NDF	This stock is under moratorium. The catch in 2024 was used to scope catches in 2025-2026
Atlantic halibut	1471	1471	1471				The catch in 2024 was used to scope catches in 2025-2026
Atlantic herring	5982	9485	9485	9485	9485	9485	DFO TACs for 2025-2026 for Herring management stocks in 3LNO: Bonavista Bay/Trinity Bay (6290t), Conception Bay/Southern Shore (945t), St. Mary's Bay/Placentia Bay (2250t).
Capelin	8606	8606	8606	14533			DFO 2J3KL TAC for 2024, 2025-2026 assumed equal to 2024. Catch in 3L=8606t assumed equal for 2025-2026. The 2025 2J3KL TAC has not been announced at the moment of this analysis.

Cod	6723	6722	6722	18950			DFO 2J3KL TAC for 2024 (18000t for domestic fisheries, representing 95% of full TAC), with 2024 catch in 3NO=241t (by-catch). 3NO Cod stock is under moratorium (NDF). Fraction in 3L of the 2024 2J3KL quota (0.34) plus 2024 3NO catch used to scope 2024-2025. The 2025 2J3KL TAC has not been announced at the moment of this analysis.
Greenland halibut	7545	7365	7335	11228	10960		The fraction of the 2024 TAC caught in 3LNO in 2024 (0.67) was used to allocate the catch based on 2025 TAC and the 2025 SC advice for 2026 (14729t). The NAFO TAC is defined as 0.741 of the TAC estimated by SC due to quota allocation practices.
Haddock	109	109	109				The catch in 2024 was used to scope catches in 2025-2026
Lobster	414	414	414				The catch in 2024 was used to scope catches in 2025-2026
Mackerel	0	0	0				The catch in 2024 was used to scope catches in 2025-2026
Other	4354	4354	4354				The catch in 2024 was used to scope catches in 2025-2026
Redfish	12170	8728	6000	38100	26000		The TACs for 2025 were 6000t for the 3LN stock and 20000t for the 3O stock. Catches in 3O have been well below the TAC, with a CSAG catch estimate of 2728t in 2024. The scoping for 2025 was done using the TAC for 3LN and the 2024 catch level for 3O, while the 2026 scoping was done assuming the 2025 TAC for 3LN, and the 2025 SC advice of No Directed Fishing for 3O.
Scallop	1	1	1				The catch in 2023 was used to scope catches in 2024-2025
Shrimp	0	0	0	NDF	NDF		The 3LNO shrimp stock is under moratorium (NDF). The catch in 2024 was used to scope catches in 2024-2025
Silver hake	7686	7686	7686				The catch in 2024 was used to scope catches in 2025-2026. Catches of this species have been increasing in this EPU.
Snow crab	36325	45333	45333	36403	45333		DFO 3LNO TAC for 2025 (45333t) was used for scoping catch in 2026.

Squid	1	1	1	34000	34000		TAC for Areas 3+4. Catches have been well below the TAC. The catch in 2024 was used to scope catches in 2025-2026
Surf clam	15619	14756	14756	14756	14756		DFO 3LNO TAC for 2025 (14756t) was used for scoping catch in 2026.
Thorny skate	2385	4500	4500	4500	4500		The 2025 TAC is 7000t, but this TAC is rarely caught. Therefore, the 4500t catch decision point from Footnote 12 in NAFO Quota Table for 2025 was used to scope catches for 2025-2026.
White hake	682	1000	1000	1000	1000		The 2025 TAC for the 3NO area was used to scope the 2026 catch.
Witch flounder	265	1413	1479	1367	1395	1461	The 2J3KL stock is under moratorium. The TACs for the 3NO stock for 2025 and 2026 are 1395t and 1461t respectively. The 3L CSAG catch estimate for 2024 is 18t. The caches for 3LNO were scoped as the corresponding 3NO TACs plus the 2024 3L CSAG catch estimate.
Wolffish	7	7	7				The catch in 2024 was used to scope catches in 2025-2026
Yellowtail flounder	3019	15810	22290	15560	15810		The 2025 TAC and the 2025 SC advice for F_{target} were used for scoping catches.
Flemish Cap (3M) EPU							
American plaice	201	201	201	NDF	NDF	NDF	This stock is under moratorium. The catch in 2024 was used to scope catches in 2025-2026
Atlantic halibut	309	309	309				The catch in 2024 was used to scope catches in 2025-2026
Cod	10582	12613	15360	11708	12613		The 2025 TAC and the 2025 SC advice for F50%HZ (F level that gives a 50% probability of staying in the Healthy zone of the PA) were used to scope the 2025-2026 catches.
Greenland halibut	2259	2205	2196	11228	10960		The fraction of the 2024 TAC caught in 3M in 2024 (0.20) was used to allocate the catch based on the 2025 TAC and the 2025 SC advice (14729t). The NAFO TAC is defined as 0.741 of the TAC estimated by SC due to quota allocation practices.
Other	247	247	247				The catch in 2024 was used to scope catches in 2025-2026
Redfish	9477	17503	15636	11171	17503	15636	The 2025-2026 TACs were used to scope the 2025-2026 catches

Shrimp	0	0	0	NDF	NDF		The 3M shrimp stock is under moratorium (NDF). The catch in 2024 was used to scope catches in 2024-2025
Squid	0	0	0	34000	34000		TAC for Areas 3+4. Catches have been well below the TAC. The catch in 2024 was used to scope catches in 2025-2026
Thorny skate	64	64	64				The catch in 2024 was used to scope catches in 2025-2026
Witch flounder	49	49	49				The catch in 2024 was used to scope catches in 2025-2026
Wolffish	106	106	106				The catch in 2024 was used to scope catches in 2025-2026
Yellowtail flounder	1	1	1				The catch in 2024 was used to scope catches in 2025-2026

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