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SCIENTIFIC COUNCIL MEETING – JUNE 2026

Report of the Scientific Council Meeting

29 May -11 June 2026
Halifax, Canada

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REPORT OF SCIENTIFIC COUNCIL MEETING
29 May -11 June 2026

Chair: Diana González-Troncoso Rapporteur: Andrea Perreault

I. PLENARY SESSIONS

The Scientific Council met at the Atrium building, Saint Mary's University, Halifax, NS, Canada, during 29 May – 11 June 2026, to consider the various matters in its Agenda. Participants attended both in person and virtually via Webex. Representatives attended from Canada, Denmark (in respect of Faroe Islands and Greenland), the European Union, Japan, Norway, the Russian Federation, Ukraine, the United Kingdom and the United States of America. Observers from the Food and Agriculture Organization (FAO), Atlantic Groundfish Council and Oceans North were also present. The Executive Secretary and other members of the Secretariat were in attendance.

The Executive Committee met prior to the opening session of the Scientific Council to discuss the provisional agenda and plan of work.

The Scientific Council was called to order at 10:03 am on 29 May 2026. The provisional agenda was **adopted** (Appendix V). The NAFO Secretariat was appointed as the rapporteur.

The opening session was adjourned at 10:30 am on 29 May 2026. Several sessions were held throughout the course of the meeting to deal with specific items on the agenda. The Scientific Council considered and **adopted** the Standing Committees reports on 11 June 2026.

The Scientific Council considered and **adopted** the Scientific Council Report of this meeting of 29 May - 11 June 2026. The Chair received approval to leave the report in draft form for about two weeks to allow for minor editing and proof-reading on the usual strict understanding there would be no substantive changes.

The meeting was adjourned at 11:45 am on 11 June 2026.

The Standing Committee on Fisheries Environment (STACFEN) did not meet in 2026 due to the absence of a Chair. An update on the situation is provided in Appendix I.

The reports of the remaining Standing Committees, as adopted by the Scientific Council, are appended as follows: Appendix II – Report of the Standing Committee on Publications (STACPUB); Appendix III – Report of the Standing Committee on Research Coordination (STACREC); and Appendix IV – Report of the Standing Committee on Fisheries Science (STACFIS).

The Agenda, Experts for Preliminary Assessment of Certain Stocks, List of Scientific Council Research (SCR) and Scientific Council Summary (SCS) Documents, and List of Participants, are provided in Appendices V-VIII, respectively.

The Scientific Council's considerations on the Standing Committee Reports, and other matters addressed by the Council, follow in Sections II-XV.

II. REVIEW OF SCIENTIFIC COUNCIL RECOMMENDATIONS IN 2025

Recommendations from 2025 are considered in the relevant sections of this report.

III. FISHERIES ENVIRONMENT

The STACFEN Chair position has been vacant since September 2025 and remains unfilled. As no Chair has been identified, the STACFEN meeting scheduled for June 2026 was cancelled. Any work that would have been undertaken at this meeting has been deferred until June 2027. As per NAFO documentation guidelines, since there were no STACFEN presentations, any SCRs related to STACFEN in 2026 were not published.

IV. PUBLICATIONS

The Scientific Council **adopted** the Report of the Standing Committee on Publication (STACPUB) as presented by the Chair, Rick Rideout. The full report of STACPUB is in Appendix II.

The recommendations made by STACPUB for the work of the Scientific Council as **endorsed** by the Scientific Council, are as follows:

- STACPUB reiterates the **recommendation** *of exploring options for delivering JNAFS notifications digitally to scientists in order to promote a broader familiarity with the journal and to potentially attract future paper submissions. This should include the development of a 'sign up for updates' link on the JNAFS website but could also include the development of an email distribution list, and/or exploring ways to reach out via social media.*
- STACPUB **recommends** that *the Secretariat consider converting existing work on the revised NAFO Precautionary Approach Framework and the NAFO Subarea 2 and Divisions 3KLMNO Greenland halibut MSE process into summary documents, to be submitted for review by SC as Scientific Council Studies*.
- STACPUB **recommends** that *the archival of previous meeting presentations and user folders continue to be maintained on the SharePoint SC meeting site for a four-year period. It was also noted that there was no need to maintain content that is now publicly available on the NAFO website (e.g. SCR, SCS docs).*

V. RESEARCH COORDINATION

The Scientific Council **adopted** the Report of the Standing Committee on Research Coordination (STACREC) as presented by the Chair, Mark Simpson. The full report of STACREC is in Appendix III.

The recommendations made by STACREC for the work of the Scientific Council as **endorsed** by the Scientific Council, are as follows:

- STACREC **recommends** *a comprehensive study to investigate redfish stock structure in NAFO Subareas 2 and 3, with considerations of species splitting and recent approaches to studying redfish stock structure in other RFMOs*.
- SC reiterates the **recommendation** that *an external reviewer be invited to provide an independent peer review of the data and assessment methodology used for full stock assessments on an annual basis.*
- STACREC **recommends** that *the NAFO Secretariat work with the FAO-CWP to update the STATLANT 21B reporting template and instructions*.
- STACREC **recommends** that *the NAFO Secretariat post the compilation of STATLANT submission rate information on the STATLANT pages of the NAFO Website*.

VI. FISHERIES SCIENCE

The Scientific Council **adopted** the Report of the Standing Committee on Fisheries Science (STACFIS) as presented by the Chair, José De Oliveira. The full report of STACFIS is in Appendix IV.

There were no general recommendations arising from STACFIS. The Council **endorsed** recommendations specific to each stock and they are highlighted under the relevant stock considerations in the STACFIS report.

VII. MANAGEMENT ADVICE AND RESPONSES TO SPECIAL REQUESTS

1. The NAFO Commission

The Commission requests are outlined in SCS Doc. 26/01.

The Scientific Council noted the Commission requests for advice on Northern shrimp (Northern shrimp in 3M) will be undertaken during the Scientific Council and STACFIS Shrimp Assessment Meeting on 15 to 17 September 2026 in Vilnius, Lithuania. Advice for redfish in Div. 3M will be undertaken during the 2026 September Scientific Council meeting.

a) Request for Advice on TACs and Other Management Measures

The Fisheries Commission at its September 2010 meeting reviewed the assessment schedule of the Scientific Council and with the concurrence of the Coastal States agreed to request advice for certain stocks on either a two-year or three-year rotational basis. In recent years, thorough assessments of certain stocks have been undertaken outside of the assessment cycle either at the request of the Commission or by the Scientific Council's own accord based on recent stock developments.

Cod in Division 3M Advice June 2026 for 2027

Recommendation for 2027

Scientific Council projected the fishing mortality scenarios defined for stocks in the Cautious Zone of the PA Framework. Under all scenarios during the projected years, the stock will remain in the Cautious Zone (below $B_{trigger}$) with a probability of at least 60%; furthermore, the median biomass at the beginning of 2028 is projected to be lower relative to 2026.

Catches for 2027 between 10 086 t and 12 452 t are consistent with the HCR from the NAFO PA. Scientific Council notes the increased uncertainty in the assessment and projections due to the lack of age and maturity data since 2023. The increased uncertainty is unquantified and not reflected in the risk table.

Management objectives

No explicit management plan or management objectives have been defined by the Commission. Convention General Principles are applied.

Convention Principle	Status	Comment
Restore to or maintain at B_{msy}	Intermediate	$B_{lim} \leq B < B_{trigger}$ (Cautious Zone)
Eliminate Overfishing (Stock)	OK	$F \leq$ Upper F range indicated by the PA
Eliminate Overfishing (Ecosystem)	OK	Total EPU catches < 2TCI
Apply Precautionary Approach	OK	All PA reference points defined
Minimize harmful impacts on living marine resources and ecosystems	Intermediate	Directed fishery, VME closures in effect, Effectiveness of bycatch regulations uncertain
Preserve marine biodiversity	Unknown	Cannot be evaluated

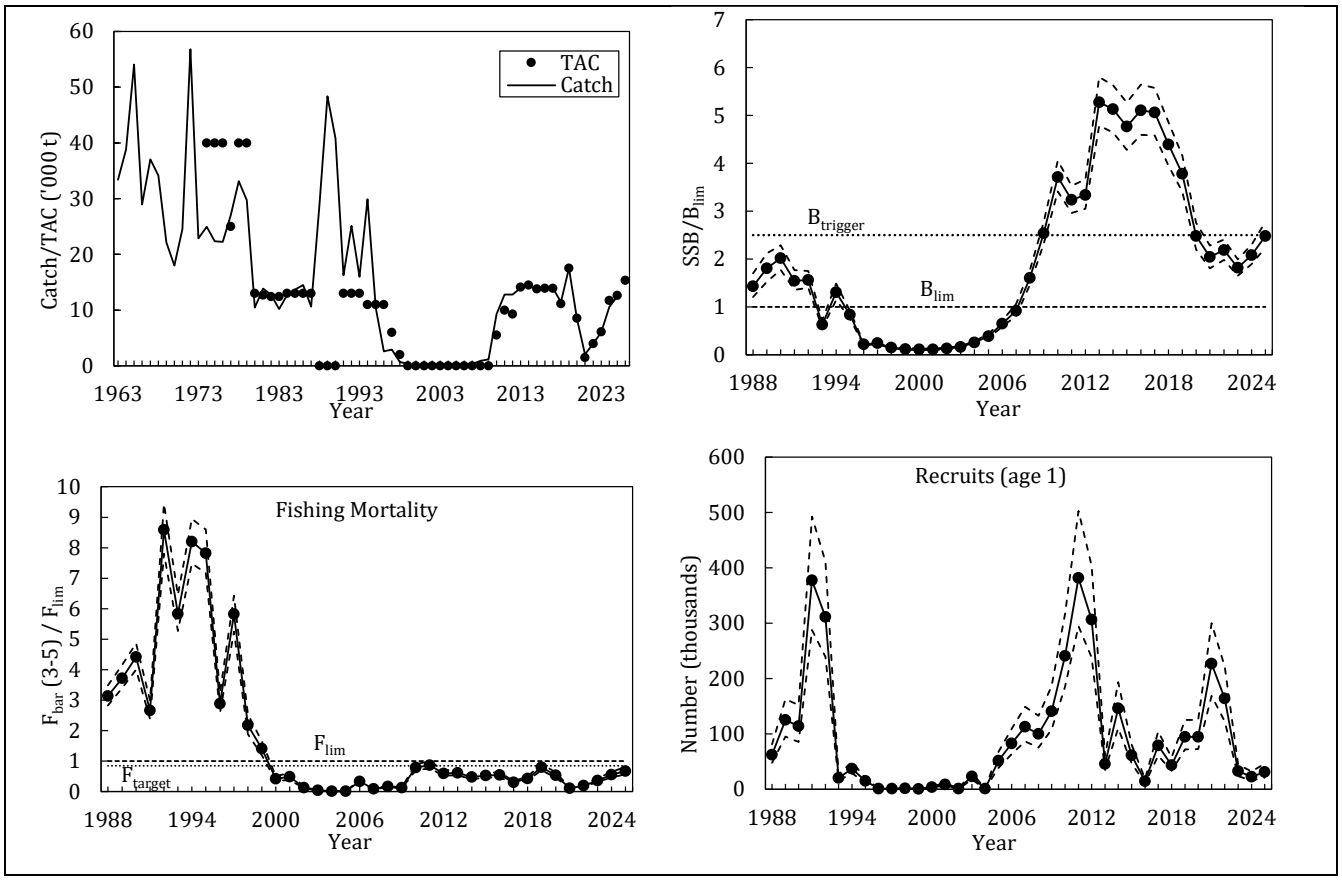
OK
Intermediate
Not accomplished
Unknown

Management unit

The cod stock on the Flemish Cap (NAFO Div. 3M) is considered to be a separate population.

Stock status

The median SSB declined rapidly since 2017 but has remained stable during the last 5 years and is estimated to be above B_{lim} and below $B_{trigger}$ (Cautious Zone) in 2025. Since 2013, recruitment has varied at intermediate levels but much lower than those observed in 2011-2012. In 2021 and 2022, good recruitments were observed, while since 2023 recruitment has been at a very low level. Fishing mortality has remained below F_{lim} since the fishery reopened in 2010. Fishing mortality has been below F_{target} during that period except in 2011. In 2021, the minimum level of F since the re-opening was reached, increasing since then. In 2025, F is below F_{lim} and F_{target} with high probability.



Reference points

B_{msy} is defined for this stock as the equilibrium SSB that corresponds to the $F_{35\%SPR}$. B_{lim} is 30% B_{msy} (B_{lim} = 15 724 t). $B_{trigger}$ is approved to be 75% B_{msy} ($B_{trigger}$ = 39 310 t). F_{lim} corresponds to $F_{35\%SPR}$ (F_{lim} = 0.171) and F_{target} is 85% of F_{lim} (F_{target} = 0.145).

Projections

Stochastic projections of the stock dynamics from 2026 to the start of 2028 were conducted. All scenarios assumed that the Yield for 2026 is the established TAC (15 360 t). F_{bar} is the mean of the F at ages 3-5 and is used as the indicator of overall fishing mortality.

The stock is projected to be in the Cautious Zone starting in 2027. Four scenarios were considered for the year 2027: F_{bar} = 0 and the three levels defined for stocks in the Cautious Zone (fishing mortality along the leaf lower edge, midrib and upper edge).

	Total Biomass	SSB	Yield
F_{bar}=0			
2026	63228 (56629 - 70987)	44861 (39607 - 51065)	15360
2027	49128 (42537 - 56774)	36982 (31283 - 43310)	0
2028	50035 (43290 - 57882)	38095 (32621 - 44667)	-
F lower edge leaf (median=0.109)			
2026	63228 (56629 - 70987)	44861 (39607 - 51065)	15360
2027	49128 (42537 - 56774)	36982 (31283 - 43310)	10086
2028	39829 (33191 - 47629)	28119 (22761 - 34600)	-
F midrib leaf (median=0.131)			
2026	63228 (56629 - 70987)	44861 (39607 - 51065)	15360
2027	49128 (42537 - 56774)	36982 (31283 - 43310)	11756
2028	38119 (31525 - 45943)	26489 (21186 - 32970)	-
F upper edge leaf (median=0.140)			
2026	63228 (56629 - 70987)	44861 (39607 - 51065)	15360
2027	49128 (42537 - 56774)	36982 (31283 - 43310)	12452
2028	37423 (30828 - 45239)	25809 (20489 - 32230)	-

			Cautious Zone		
		F=0	F lower edge leaf (median=0.109)	F midrib leaf (median=0.131)	F upper edge leaf (median=0.140)
Yield (50%)	2026	15360	15360	15360	15360
	2027	0	10086	11756	12452
$P(F>F_{lim})$	2026	6%	6%	6%	6%
	2027	<1%	1%	8%	15%
$P(SSB<B_{lim})$	2026	<1%	<1%	<1%	<1%
	2027	<1%	<1%	<1%	<1%
	2028	<1%	<1%	<1%	<1%
$P(F>F_{target})$	2026	30%	30%	30%	30%
	2027	<1%	7%	28%	42%
$P(SSB<B_{trigger})$	2026	9%	9%	9%	9%
	2027	70%	70%	70%	70%
	2028	60%	99%	>99%	>99%
$P(SSB_{2028}>SSB_{2026})$		<1%	<1%	<1%	<1%
$(SSB_{2028} - SSB_{2026}) / SSB_{2026}$		-16%	-38%	-41%	-43%

Under all the scenarios during the projected years (including F=0), the stock will remain in the Cautious Zone (below $B_{trigger}$) with a probability of at least 60%; furthermore, the median biomass at the beginning of 2028 is projected to be lower relative to 2026.

Under all scenarios, the probability of F_{bar} exceeding F_{lim} is less than or equal to 15% in 2027.

Assessment

A Bayesian SCAA model, introduced at the 2018 benchmark, was used as the basis for the assessment of this stock with data from 1988 to 2025.

The next full assessment for this stock will be in 2027.

Human impacts

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

Biological and environmental interactions

Redfish, shrimp and small cod are important prey items for cod. There are strong trophic interactions between these species on the Flemish Cap.

The Flemish Cap (3M) Ecosystem Production Unit (EPU), with the exception of a short-lived increase in 2005-2009, has shown a fairly stable total biomass over time despite the changes in individual stocks. This indicates no major changes in overall ecosystem productivity.

Ecosystem sustainability of catches

The impact of bottom fishing activities on 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.

3M cod is included in the piscivores guild of the Flemish Cap (3M) Ecosystem Production Unit (EPU). Other NAFO managed stocks in this guild and EPU are 3M redfish and 2+3KLMNO Greenland halibut. The Catch/TCI for 2025 was below the 2TCI ecosystem reference point (3M Piscivore $Catch_{2025}$/TCI=1.62).

Fishery

Cod is caught in directed trawl and longline fisheries and as bycatch in the directed redfish trawl fishery. The fishery is regulated by quota. New technical regulations were introduced in 2021, in particular a closure of the directed fishery in the first quarter as well as sorting grids to protect juveniles.

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

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
TAC	13.9	11.1	17.5	8.5	1.5	4.0	6.1	11.7	12.6	15.4
Catch[1]	13.9	11.5	17.5	8.5	2.1	4.0	6.2	10.6	12.5	

[1]CESAG estimates

Special comments

Scientific Council notes the increased uncertainty in the assessment and projections due to the lack of data (Age Length Keys and Maturity Ogives) since 2023. The increased uncertainty is unquantified and not reflected in the risk table.

Sources of information

SCS Doc. 26/05, 26/06, 26/09 and SCR 26/03, 26/023.

Redfish in Division 3M

Deferred to September 2026.

American plaice in Division 3M Advice June 2026 for 2027-2029

Recommendation for 2027 - 2029

Scientific Council is not in a position to apply the PA framework due to inability to estimate the PA reference points at this time.

The stock has increased to above the time series mean, but this increase has been slow and dependent on past good recruitments and low levels of removals. Stock growth has been observed under current catches (200-400 t), but recruitment has been poor since 2018. Scientific Council considers that there is no sufficient supporting evidence that the stock would be able to sustain increased removals at this time.

Management objectives

No explicit management plan or management objectives have been defined by the Commission. Convention general principles are applied.

Convention Principle	Status	Comment
Restore to or maintain at B_{msy}		$B_{trigger}$ and B_{lim} undefined, stock status unknown
Eliminate Overfishing (Stock)		F_{lim} undefined, no directed fishing, F is low
Eliminate Overfishing (Ecosystem)		Total EPU catches < 2TCI
Apply Precautionary Approach		No reference points defined
Minimize harmful impacts on living marine resources and ecosystems		No directed fishing
Preserve marine biodiversity		Cannot be evaluated

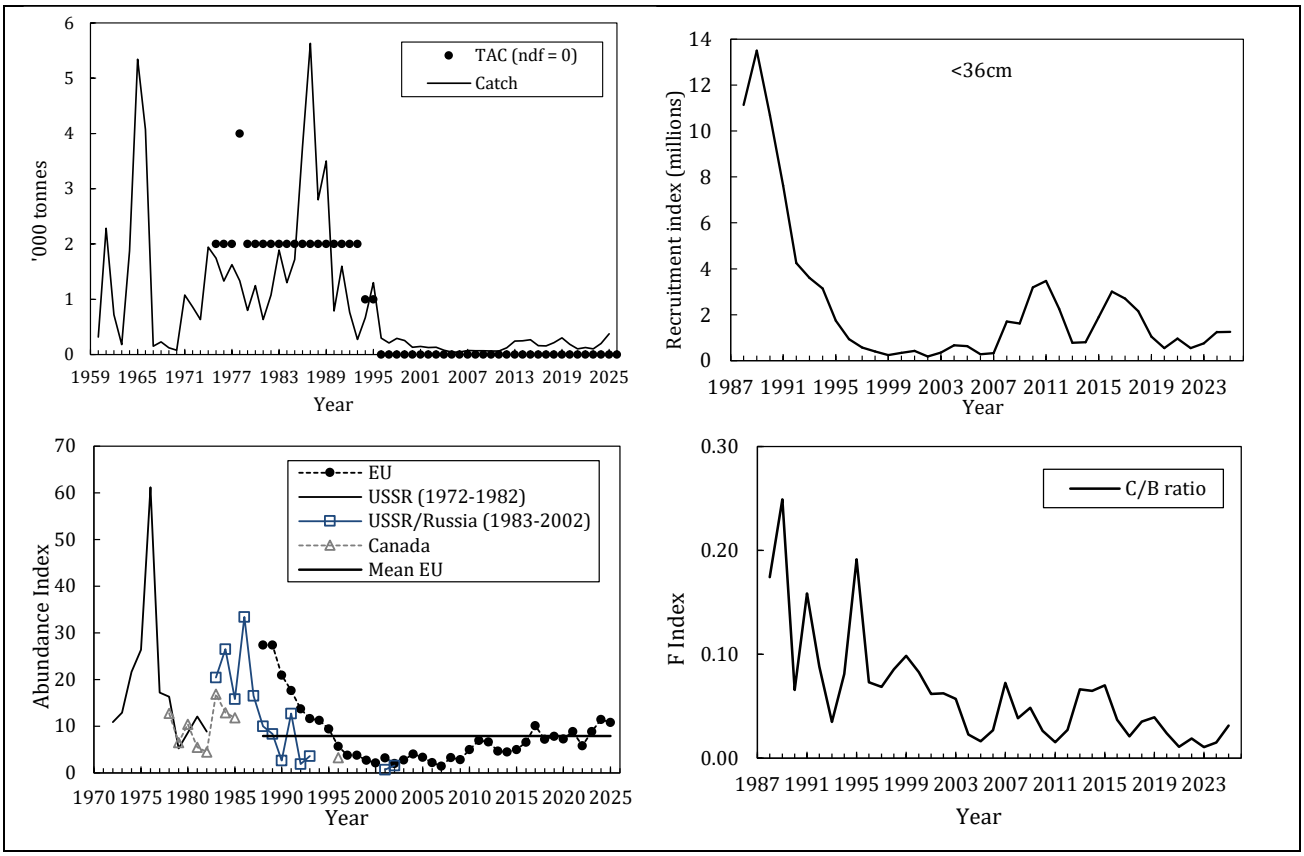
OK
Intermediate
Not accomplished
Unknown

Management unit

The American plaice stock on the Flemish Cap (Div. 3M) is considered to be a distinct population.

Stock status

The survey biomass index increased from 2007 mainly due to two recruitment pulses in 2008-2012 and 2015-2018, and increased to levels above the average for the entire series. However, recruitment has been poor since 2018 and the fishing mortality index remains around low levels within its time series.



Reference points

Scientific Council is not able to provide proxies for biomass or fishing mortality reference points at this time.

Projections

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

Assessment

No analytical assessment was performed. Survey indices and and fishery data were used to monitor the stock.

The next full assessment is planned for 2029.

Human impacts

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

Biological and environmental interactions

The stock occurs mainly at depths shallower than 600 m on the Flemish Cap. American plaice diet in the Flemish Cap (3M) EPU is typically dominated by invertebrates. Brittle stars and sea urchins are the most common prey but shrimp and amphipods have also been important.

The Flemish Cap (3M) Ecosystem Production Unit (EPU), with the exception of a short-lived increase in 2005-2009, has shown a fairly stable total biomass over time despite the changes in individual stocks. This indicates no major changes in overall ecosystem productivity.

Ecosystem sustainability of catches

The impact of bottom fishing activities on 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.

Div. 3M American plaice is included in the benthivore guild of the Flemish Cap (3M) Ecosystem Production Unit (EPU). The other NAFO managed stock in this guild and EPU is 3M shrimp. The Catch/TCI for 2025 was below the 2TCI ecosystem reference point (3M Benthivore $Catch_{2025}$/TCI=0.02).

Fishery

American plaice is caught as bycatch in otter trawl fisheries, mainly the cod and redfish fisheries. From 1979 to 1993 a TAC of 2 000 t was in effect for this stock. A reduction to 1 000 t was agreed for 1994 and 1995 and a moratorium was agreed to thereafter.

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

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
TAC	ndf	ndf	ndf	ndf	ndf	ndf	ndf	ndf	ndf	ndf
Catches [1]	0.2	0.2	0.3	0.2	0.1	0.1	0.1	0.2	0.4	

ndf No directed fishing.
1 CESAG estimates

Special comments

No special comments

Sources of information

SCR Doc. 23/024; 26/03, 20; SCS Doc. 24/06, 11; 25/08,09; 26/05, 06, 10

Redfish in Divisions 3LN Advice June 2026 for 2027-2028

Recommendation for 2027 and 2028

Given that Division 3LN redfish is assessed using an index-based assessment, Scientific Council is unable to provide projections for the range of Fs required in the NAFO Advice table. Divs. 3LN redfish is estimated to be above the biomass series average and there is a 19% risk of being below B_{lim}, therefore the stock is not in the Critical Zone of the NAFO Precautionary Approach Framework. Relative fishing mortality is low and remains well below the time series high seen in the early 1990's.

Given that catches over the most recent five years have allowed the stock to increase (in terms of the point estimate), Scientific Council advises a catch consistent with these levels (4 804 t to 12 131 t, averaging 8 705 t).

Management objectives

No explicit management plan or management objectives have been defined by the Commission. Convention general principles are applied.

Convention Principle	Status	Comment
Restore to or maintain at B_{msy}		$B \geq B_{lim}$, $B_{trigger}$ undefined
Eliminate Overfishing (Stock)		F_{lim} undefined, F is considered to be low
Eliminate Overfishing (Ecosystem)		Total EPU catches < 2TCI
Apply Precautionary Approach		B_{lim} defined, other B and F reference points undefined
Minimize harmful impacts on living marine resources and ecosystems		Directed fishery, VME closures in effect, Effectiveness of bycatch regulations uncertain
Preserve marine biodiversity		Cannot be evaluated

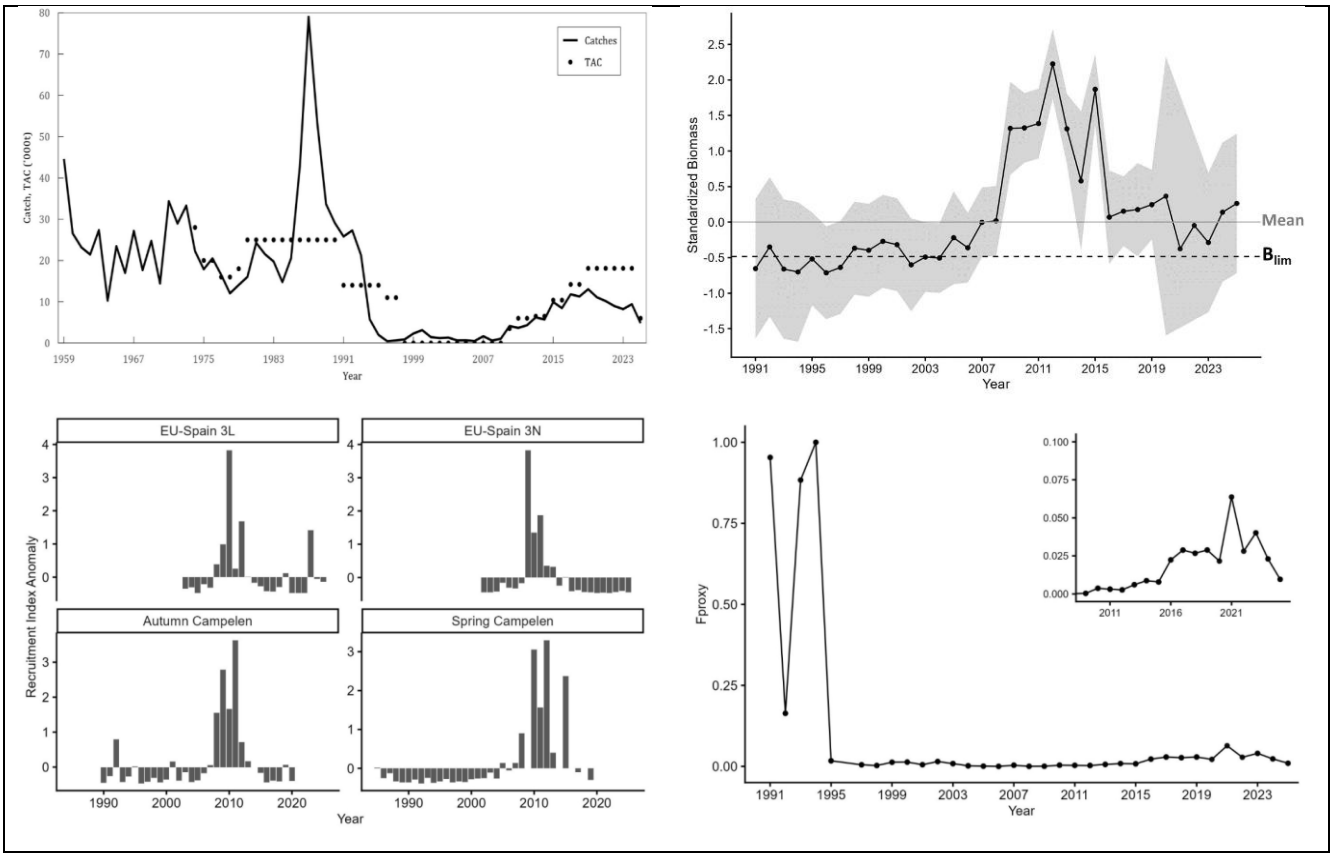
OK
Intermediate
Not accomplished
Unknown

Management unit

The management unit is defined as NAFO Divisions 3LN. This stock includes two species of redfish in Divisions 3L and 3N, the deep-sea redfish (*Sebastes mentella*) and the Acadian redfish (*Sebastes fasciatus*) that have been commercially fished and reported collectively as redfish in fishery statistics.

Stock status

The stock has increased since 2023. There is a 19% risk of the stock being below B_{lim} in 2025. Recruitment (abundance 15-20 cm) has been below the long-term average since the mid-2010s in all surveys, with the exception of the 2023 EU-Spain survey in 3L. Relative fishing mortality has been decreasing in recent years, remaining well below the time series high seen in the early 1990's.



Reference points

A biomass limit reference point (B_{lim}) is based on the combined mean standardized survey biomass of 3N EU-Spain, Canadian autumn Campelen and spring Campelen surveys for the period 1991-2005. This period was chosen as it represented a time when stock biomass recovered from a prolonged period at a low level.

Assessment

No analytical assessment was performed.

This assessment is based on a combined 3L and 3N EU-Spain, Canadian autumn Campelen and spring Campelen survey mean standardized index.

The next assessment is scheduled for 2028.

Human impacts

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

Biology and environmental interactions

There are three species of the genus Sebastes with distribution overlapping in several areas of Northwest Atlantic, the deep sea redfish (*Sebastes mentella*), Acadian redfish (*Sebastes fasciatus*) and golden redfish (*Sebastes norvegicus*).

Redfish diet in the Grand Bank (3LNO) EPU typically includes large zooplankton species (e.g. amphipods, euphausiids), small forage fishes (e.g. sandlance and capelin), and shrimp.

The Grand Bank (3LNO) Ecosystem Production Unit (EPU) continues to experience low productivity conditions, with EPU biomass below pre-collapse levels (pre-1990s). Rebuilding has been observed since the 1990s, but

declines across multiple trophic levels and stocks occurred in the mid 2010s. Positive signals have been observed since these declines, with EPU biomass near the post-collapse highs of the early-mid 2010s.

Ecosystem sustainability of catches

The impact of bottom fishing activities on 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. Some areas in the Grand Bank (3LNO) EPU have been closed to bottom fishing to protect sponge and coral species.

3LN redfish is included in the piscivores guild of the Grand Bank (3LNO) Ecosystem Production Unit (EPU). Other NAFO managed stocks in this guild within the EPU include 3O redfish, 3NO cod, 3NOPs white hake and 2+3KLMNOPs Greenland halibut. The Catch/TCI for 2025 was below the 2TCI ecosystem reference point (3LNO Piscivore $Catch_{2025}$/TCI=1.43).

Fishery

Between 1959 and 1960, reported catches dropped from 44 600 to 26 600 t, fluctuating over the next 25 years (1960-1985) around an average level of 21 000 t. Catches increased to a 79 000 t high in 1987 and declined steadily to a 450 t minimum in 1996. A moratorium on directed fishing for this stock was implemented in 1998. Catches remained at relatively low levels (450-3 000 t) until 2009. From 2011 onwards–catches steadily increased to 13 050 t in 2019, the highest level recorded since 1993. Since then, catches have been decreasing and have remained below the TAC. In 2025, total catch was estimated to be 4 804 t.

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

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
TAC	14.2	14.2	18.1	18.1	18.1	18.1	18.1	18.1	6.0	6.0
Catches[1]	11.8	11.3	13.1	11.1	10.2	9.0	8.2	9.4	4.8	

[1]CESAG estimates

Special comments

Redfish are known to have variable and episodic recruitment, with potentially large periods of time between recruitment pulses and poorly understood 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 Doc. 26/01, 02, 26; SCS Doc. 26/06, 07, 10

American plaice in Divisions 3LNO Advice June 2026 for 2027 and beyond

Recommendation for 2027 and beyond

The Scientific Council did not undertake a full assessment for this stock. Advice for American plaice in Divs. 3LNO is provided based on an Interim Monitoring Report which indicates that there is no change in the status of this stock. Scientific Council reiterates the advice that, in accordance with the rebuilding plan, there should be no directed fishing on American plaice in Divs. 3LNO until an assessment indicates a very low probability of being below B_{lim}. Bycatch of American plaice should be kept to the lowest possible level and restricted to unavoidable bycatch in fisheries directing for other species.

During the 2025 Annual meeting, the Commission requested that in June 2026, advice should be provided for 2027-2028 for Divs. 3LNO American plaice. Consistent with the SC's recommendations since June 2024 and considering the workload of the SC, a full assessment was not performed.

An Interim Monitoring Report updating the most recent survey indices and catch was prepared by the Scientific Council and presented in plenary. Based on current information there is no change in the status of this stock.

SC reiterates that there will be no full assessment until interim monitoring shows that conditions have changed or a benchmark process has been completed. SC has identified this stock as a priority for undertaking a benchmark process, and a proposed workplan to facilitate this work is outlined in Commission request #12. This workplan is expected to be completed in early 2028, with a full assessment of American plaice in 3LNO in June 2028.

Witch flounder in Divisions 3NO Advice June 2026 for 2027-2028

Recommendation for 2027 and 2028

Scientific Council projected the fishing mortality scenarios for 2027 to 2028 as defined for stocks in the Cautious Zone of the NAFO PA Framework. It is projected that the stock will remain below $B_{trigger}$ with an annual probability of 94 to 97% and there remains an annual risk of 14 to 20% that the stock will be below B_{lim}.

Catches between 131 t and 647 t in 2027 and between 205 t and 801 t in 2028 are consistent with the HCR from the NAFO PA.

Management objectives

No explicit management plan or management objectives have been defined by the Commission. Convention General Principles are applied.

Convention Principle	Status	Comment
Restore to or maintain at B_{msy}	Intermediate	$B_{lim} \leq B < B_{trigger}$ (Cautious Zone)
Eliminate Overfishing (Stock)	OK	$F \leq$ Upper F range indicated by the PA
Eliminate Overfishing (Ecosystem)	OK	Total EPU catches < 2TCI
Apply Precautionary Approach	OK	All PA reference points defined
Minimize harmful impacts on living marine resources and ecosystems	Intermediate	Directed fishery, VME closures in effect, Effectiveness of bycatch regulations uncertain
Preserve marine biodiversity	Unknown	Cannot be evaluated

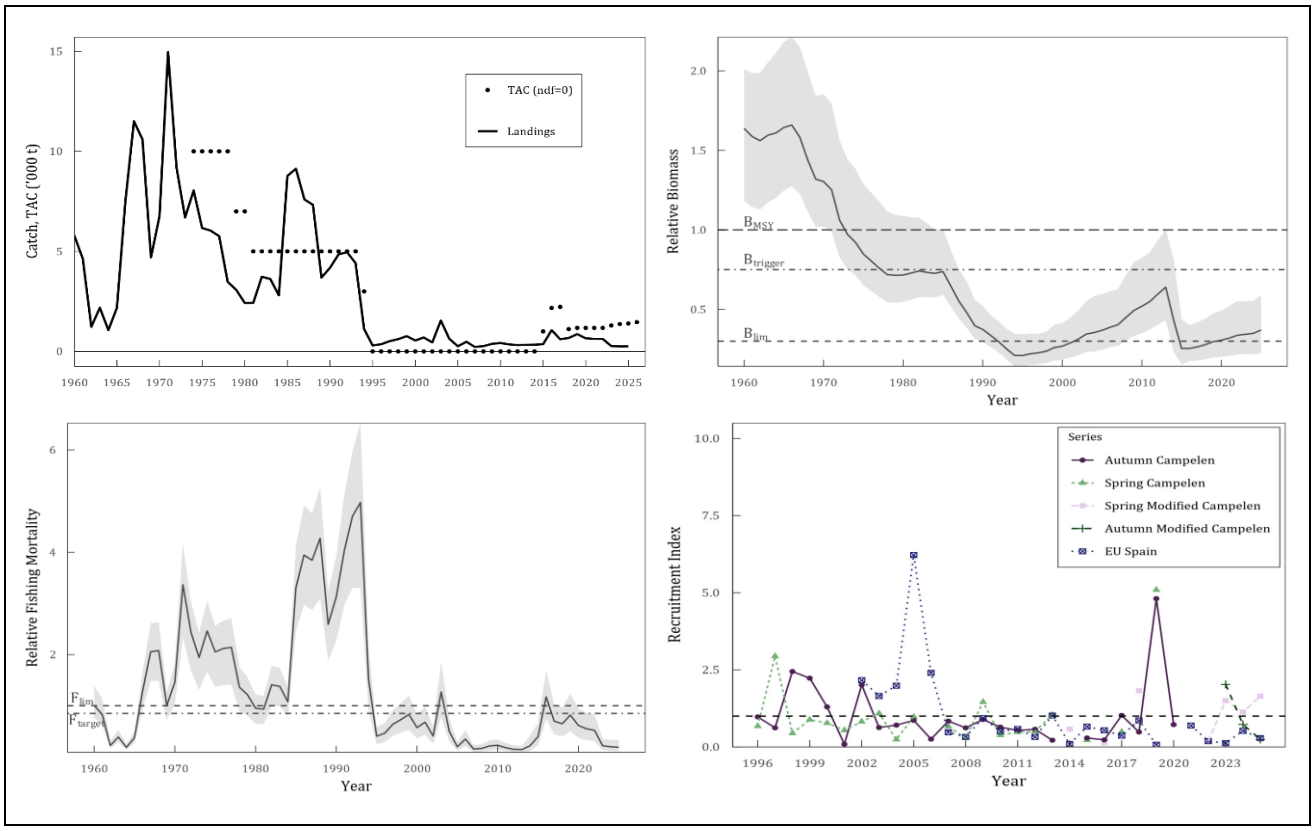
OK
Intermediate
Not accomplished
Unknown

Management unit

The management unit is NAFO Divisions 3NO. The stock mainly occurs in Div. 3O along the southwestern slopes of the Grand Bank.

Stock status

The stock is in the Cautious Zone. The stock has increased slightly since 2015 and is estimated at 37% B_{msy}. There is a very high risk (>99%) of the stock being below $B_{trigger}$ and a very low risk (<1%) of F being above F_{lim}=F_{msy} or $F_{trigger}$. There is a 28% risk of the stock being below B_{lim}. Recent recruitment appears to be average.



Reference points

B_{lim} is 30% B_{msy}, $B_{trigger}$ is 75% B_{MSY}, F_{lim} is $F_{msy,}$ and F_{target} is 85% F_{msy} (COM-SC Doc. 24-03).

Projections

Stochastic projections were conducted for $Catch_{2026}$ = TAC_{2026} (1 461 t). As per the NAFO PA Framework for stocks in the Cautious Zone, fishing mortality was applied along the leaf lower edge, midrib and upper edge. Projections were also conducted for F=0.

There is a high annual probability (94–97%) of the stock remaining in the Cautious Zone from 2027 to 2028 under the PA leaf. There remains an annual probability of 14–20% of being in the Critical Zone from 2027 to 2028 under the PA leaf. With the exception of 2026 (52% risk of *F* exceeding F_{msy} in 2026), fishing mortality is projected to remain low if the F values along the PA leaf are adhered to. Projections show a high probability (>99%) that the stock will grow from 2026 to 2029.

Catch 2026 = 1 461 t (TAC)			
Year	*F*	Yield ('000t) Median	Start of year relative Biomass (B/B_{msy}) Median (80% CI)
F = 0			
2026	0.060	1.461	0.40 (0.24, 0.60)
2027	0	0	0.42 (0.25, 0.63)
2028	0	0	0.46 (0.27, 0.69)
2029	-	-	0.50 (0.30, 0.74)
Lower Edge Leaf			
2026	0.060	1.461	0.40 (0.24, 0.60)
2027	0.005	0.131	0.42 (0.25, 0.63)
2028	0.007	0.205	0.45 (0.27, 0.67)
2029	-	-	0.49 (0.30, 0.71)
Midrib Leaf			
2026	0.060	1.461	0.40 (0.24, 0.60)
2027	0.013	0.326	0.42 (0.25, 0.63)
2028	0.017	0.461	0.45 (0.27, 0.66)
2029	-	-	0.49 (0.30, 0.69)
Upper Edge Leaf			
2026	0.060	1.461	0.40 (0.24, 0.60)
2027	0.026	0.647	0.42 (0.25, 0.63)
2028	0.030	0.801	0.45 (0.27, 0.66)
2029	-	-	0.47 (0.30, 0.68)

Catch 2026 = 1 461 t (TAC)					
Cautious Zone		F = 0	F lower edge leaf	F mid rib leaf	F upper edge leaf
Yield ('000 t) (50%)	2026	1 461 t	1 461 t	1 461 t	1 461 t
	2027	0 t	131 t	326 t	647 t
	2028	0 t	205 t	461 t	801 t
$P(F>F_{lim})$	2026	52%	52%	52%	52%
	2027	<1%	<1%	<1%	<1%
	2028	<1%	<1%	<1%	<1%
$P(B<B_{lim})$	2026	22%	22%	22%	22%
	2027	20%	20%	20%	20%
	2028	14%	14%	14%	14%
	2029	10%	10%	10%	10%
$P(F>F_{target})$	2026	70%	70%	70%	70%
	2027	<1%	<1%	<1%	<1%
	2028	<1%	<1%	<1%	<1%
$P(B<B_{trigger})$	2026	98%	98%	98%	98%
	2027	97%	97%	97%	97%
	2028	94%	96%	96%	96%
	2029	90%	94%	94%	95%
$P(B_{2029}>B_{2026})$		>99%	>99%	>99%	>99%
$(B_{2029}-B_{2026})/B_{2026}$		23%	20%	19%	17%

Assessment

A Schaefer surplus production model in a Bayesian framework was used for the assessment of this stock. The results indicated the same trend as previous assessments. Input data comes from research surveys and the fishery.

The next full assessment of this stock will be in 2028.

Human impacts

Mainly fishery related mortality. Other sources (e.g. pollution, shipping, and oil-industry) are undocumented.
Biological and environmental interactions

Witch flounder in NAFO Divs. 3NO are distributed mainly along the tail and southwestern slopes of the Grand Bank. Witch flounder diet in the Grand Bank (3LNO) EPU is dominated by polychaetes and amphipods.

The Grand Bank (3LNO) Ecosystem Production Unit (EPU) continues to experience low productivity conditions, with EPU biomass below pre-collapse levels (pre-1990s). Rebuilding was observed since the 1990s, but declines across multiple trophic levels and stocks occurred in the mid 2010s. Positive signals have been observed since these declines, with EPU biomass near the post-collapse highs of the early-mid 2010s.

Ecosystem sustainability of catches

The impact of bottom fishing activities on 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. Some areas in the Grand Bank (3LNO) EPU have been closed to bottom fishing to protect sponge and coral species.

3NO witch flounder is included in the benthivore guild of the Grand Bank (3LNO) Ecosystem Production Unit (EPU). Other NAFO managed stocks in this guild within the EPU include 3LNOPs thorny skate, 3LNO yellowtail flounder, 3LNO American plaice, and SSAR shrimp. The Catch/TCI for 2025 was below the 2TCI ecosystem reference point (3LNO Benthivore $Catch_{2025}$/TCI=0.92).

Fishery

While the fishery was reopened to directed fishing in 2015 and is exploited by otter trawl, witch flounder are caught primarily as bycatch in bottom otter trawl fisheries for yellowtail flounder, redfish, skate, silver hake, Atlantic cod and Greenland halibut.

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

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
TAC	2.2	1.1	1.2	1.2	1.2	1.2	1.3	1.4	1.4	1.5
Catch[1]	0.7	0.7	0.9	0.7	0.6	0.6	0.3	0.2	0.3	

[1] CESAG estimates

Special comments

It is unclear if the recruitment index (survey number of fish <21 cm) is representative of the stock. Assuming that it is, recent recruitment appears to be average.

Sources of Information

SCR Docs 26/XXX, 002, 001; SCS 26/05, 06, 07, 10.

Thorny skate in Divisions 3LNO and Subdivision 3Ps Advice June 2026 for 2027 and beyond

Recommendation for 2027 and beyond

The Scientific Council is unable to carry out a full assessment or an Interim Monitoring Report for this stock due to the lack of a Designated Expert. Updated advice for thorny skate in Divs. 3LNOPs cannot be provided at this time. In the absence of new science advice, Scientific Council recommends increased precaution in the management of this stock until an assessment can be conducted.

During the 2025 Annual meeting, the Commission requested that in June 2026, advice should be provided for 2027-2028 for Divs. 3LNO thorny skate. The Designated Expert position for this stock has been vacant since 2025. The lack of a Designated Expert for this stock prevented the Scientific Council from being able to carry out a full assessment or an Interim Monitoring Report. This situation will persist until a DE is appointed.

The relevant data for this stock can be found in previous Scientific Council reports, in the National Research Reports for the year 2025, and in the survey SCRs.

b) Monitoring of Stocks for which Multi-year Advice was Provided in 2023, 2024 or 2025

i) Interim monitoring updates of these stocks were conducted, and Scientific Council reiterates its previous advice as follows:

Recommendation for yellowtail flounder in Divisions 3LNO for 2026-2027: Scientific Council projected the fishing mortality scenarios defined for stocks in the Healthy Zone of the PA Framework. All scenarios are projected to maintain the stock above $B_{trigger}$ with a probability of 96% or higher. F_{target} corresponds to catches of 24 290 t and 22 000 t in 2026 and 2027, respectively. These catch levels have risks of no more than 25% of exceeding F_{lim}.

Recommendation for redfish in Division 3O for 2026-2028: The stock has decreased since 2012 and there is a 62% risk of the stock being below B_{lim} in 2024. To be consistent with the NAFO Precautionary Approach, Scientific Council advises that no directed fishery should occur in 2026, 2027, and 2028. Bycatch should be kept at the lowest possible level.

Recommendation for cod in Divisions 3NO for 2022 and beyond: No directed fishing from 2022 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. There will be no full assessment until interim monitoring shows that conditions have changed.

Recommendation for capelin in Divisions 3NO for 2022 and beyond: No directed fishery. There will be no full assessment until interim monitoring shows that conditions have changed.

Recommendation for alfonsino stocks in Division 6G for 2022 and beyond: The substantial decline in CPUE and catches on the Kükenthal Peak in the past year indicates that the stock may be depleted. SC advises to close the fishery until biomass increases to exploitable levels. There will be no full assessment until interim monitoring shows that conditions have changed.

Recommendation for roughhead grenadier in Subareas 2 and 3: There will be no new assessment until monitoring shows that conditions have changed.

ii) In some cases, interim monitoring updates of stocks was not possible and Scientific Council is unable to reiterate its previous advice:

Recommendation for white hake in Divisions 3NO and Subdivision 3Ps for 2027 and beyond: The Scientific Council is unable to carry out an Interim Monitoring Report for this stock due to the lack of a Designated Expert. In the absence of new science advice, Scientific Council recommends increased precaution in the management of this stock until an assessment can be conducted.

c) Ecosystem Components of the Stock Advice

As part of the stock advice, Annex A of the Commission's request for Scientific Advice provides guidance on the provision of advice: *In relation to Tier 1 of the Roadmap Scientific Council should provide annually catch information in relation to 2TCI, including recent cumulative catch levels and a scoping of expected cumulative catch levels. Ecosystem summary sheets should be monitored annually and updated on a five-year cycle.*

i) Interim monitoring of Ecosystem Conditions in the Grand Bank (3LNO) and Flemish Cap (3M) Ecosystem Production Units (EPUs)

Scientific Council responded:

The interim monitoring of ecosystem conditions for 2024-2025 indicated that the changes observed in these EPUs are in line with already identified patterns and trends for these ecosystems, and therefore, do not meet the "significant ecological changes" criterion required to trigger an update of the Ecosystem Summary Sheets (ESSs) out of schedule.

The next regular update of the ESSs for the Grand Bank (3LNO) and Flemish Cap (3M) EPUs is scheduled for 2028.

The Ecosystem Designated Expert (EDE) position for the Grand Bank (3LNO) EPU remains vacant. If this position is not filled with sufficient time in advance for the work to be done, the 2028 regular update of the ESS for this EPU cannot be completed.

As part of the implementation of the NAFO Roadmap for an Ecosystem Approach to Fisheries (EAF), Ecosystem Summary Sheets (ESSs) provide a synoptic view on the state of NAFO ecosystems and their management regime, and constitute a tool for strategic assessment, advice and planning. ESSs have been developed for the Grand Bank (3LNO) and Flemish Cap (3M) Ecosystem Production Units (EPUs) (SCS 23/18), and are intended to undergo regular updates every 5 years. After a delay of one year due to workload, the next regular update of the ESSs for these EPUs is scheduled to be produced by Scientific Council (SC) at its June 2028 meeting.

In the years between regular updates, ecosystem conditions in both EPUs are monitored annually. This interim monitoring is focused on the detection of significant ecological changes, in which case an out-of-schedule ESS update needs to be triggered.

The evaluation of significant ecological changes is focused on an expert judgment examination of: a) trends in ocean climate and oceanographic features, b) trends and structure of the fish community, and c) trends in trophic relationships (e.g. diet composition, stomach content weights).

The interim monitoring of ecosystem conditions for 2024-2025 indicated that the changes observed in the Grand Bank (3LNO) and Flemish Cap (3M) EPUs are in line with already identified patterns and trends for these ecosystems, and therefore, do not meet the "significant ecological changes" criterion required to trigger an out-of-schedule update of the ESSs.

The Ecosystem Designated Expert (EDE) position for the Grand Bank (3LNO) EPU remains vacant. If this position is not filled with sufficient time in advance for the work to be done, the 2028 regular update of the ESS for this EPU cannot be completed.

References

NAFO, 2023. Report of the Scientific Council Meeting, 02-15 June 2023 Halifax, Nova Scotia. NAFO SCR Document 23/18.

ii) Report on Ecosystem Sustainability of Catches

Scientific Council responded:

Since 2005 the Grand Bank (3LNO) and the Flemish Cap (3M) Ecosystem Production Units (EPUs) have shown aggregate catch levels by functional guild which are consistent with the productivity of the EPUs and the avoidance of a high risk of ecosystem overfishing.

For the Grand Bank (3LNO) EPU, scoped catch levels for 2026-2027 indicate that piscivore guild catches would be below the 2TCI Ecosystem Reference Point in 2026 and increase to the 2TCI level in 2027.

For the Flemish Cap (3M) EPU, scoped catch levels for 2026-2027 indicate that piscivore guild catches would exceed the 2TCI Ecosystem Reference Point in 2026 but decline below it the following year.

Approach:

Total Catch Index (TCI): This index is an indicator of the level of aggregated catch for a given functional guild (aggregate of species) that is consistent with the current productivity of the ecosystem (ecosystem sustainability). The comparison of aggregate catches with TCI is informative of the risk of ecosystem overfishing.

NAFO has adopted 2TCI as an ecosystem reference point to inform on ecosystem overfishing.

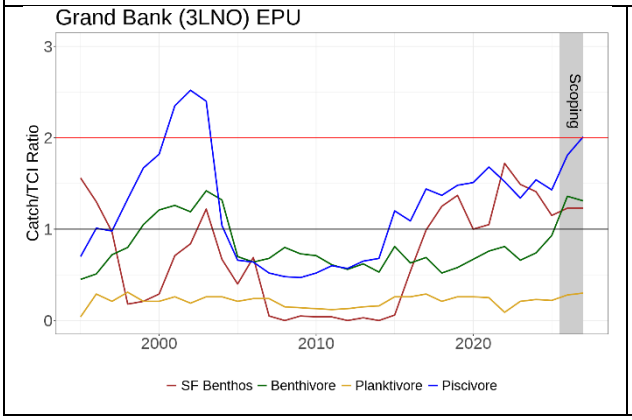
Analysis includes reported catches up to 2025, and the scoping of likely catches for 2026-2027. The 2026 scoping is based on adopted catch limits for 2026. The 2027 scoping is based on adopted catch limits in the case of multi-year management decisions or assuming the maximum catch level from the 2026 Scientific Council (SC) advice for 2027.

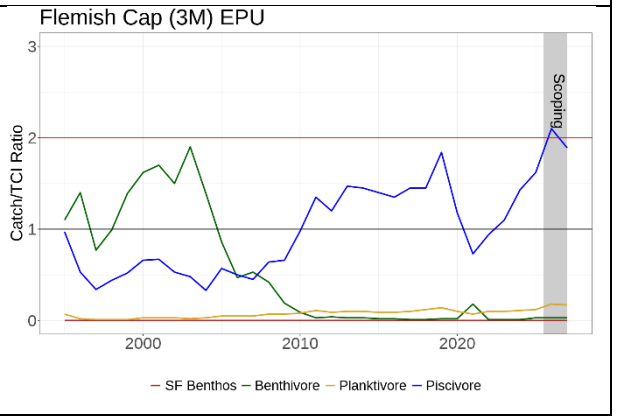
Generally,

- for stocks in the Healthy zone, catch is assumed at F_{target},

- for stocks in the Cautious zone, catch is assumed at $F_{upper\ leaf}$,

- for stocks where SC recommended catches differ from these definitions, it is assumed the recommendation is followed.





Summary:

During the 1960-1995 period, Ecosystem Production Units (EPUs) in the Newfoundland and Labrador, and Flemish Cap bioregions, experienced sustained catch levels consistent with ecosystem overfishing.

Since 2005 aggregated catches for all functional guilds have been below the 2TCI Ecosystem Reference Point in the Grand Bank (3LNO) and the Flemish Cap (3M) EPUs.

The catch levels for 2025 indicate an intermediate risk of ecosystem overfishing on both the Flemish Cap (3M) and the Grand Bank (3LNO) EPUs.

The piscivore guild catches in the Grand Bank (3LNO) EPU are scoped to be below the 2TCI Ecosystem Reference Point in 2026, and increase to the 2TCI level in 2027, which corresponds to a high risk of ecosystem overfishing.

The piscivore guild catches in the Flemish Cap (3M) are scoped to exceed the 2TCI Ecosystem Reference Point in 2026, which corresponds to a high risk of ecosystem overfishing, but declining below 2TCI in 2027.

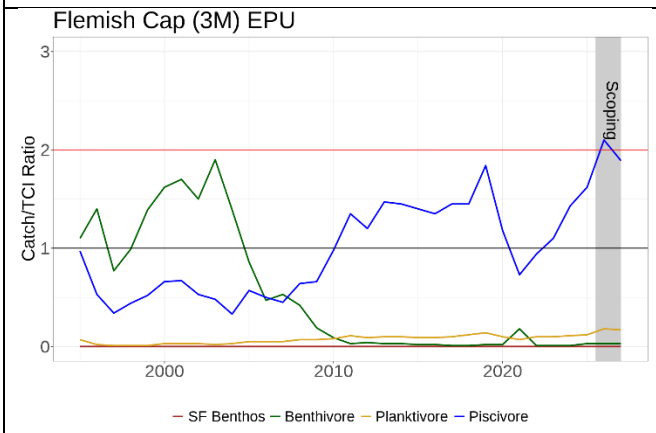
Risk of ecosystem overfishing:

Catch > 2TCI: high risk of ecosystem overfishing

Catch between 1 and 2 TCI: intermediate risk of ecosystem overfishing

Catch < TCI: low risk of ecosystem overfishing

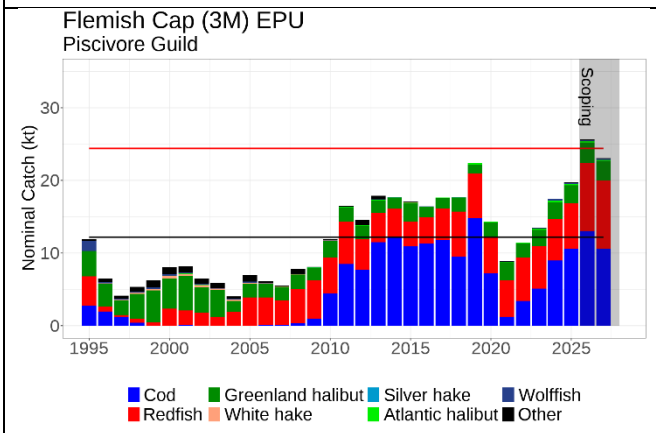
Flemish Cap (3M) Ecosystem Production Unit (EPU)



Overview

2025 catches for all functional guilds were below 2TCI, indicating that fishing levels have been consistent with preventing a high risk of ecosystem overfishing.

Piscivore guild catches for 2026-2027 are scoped to exceed the 2TCI Ecosystem Reference Point in 2026, which corresponds to a high risk of ecosystem overfishing, but decline below 2TCI in 2027.



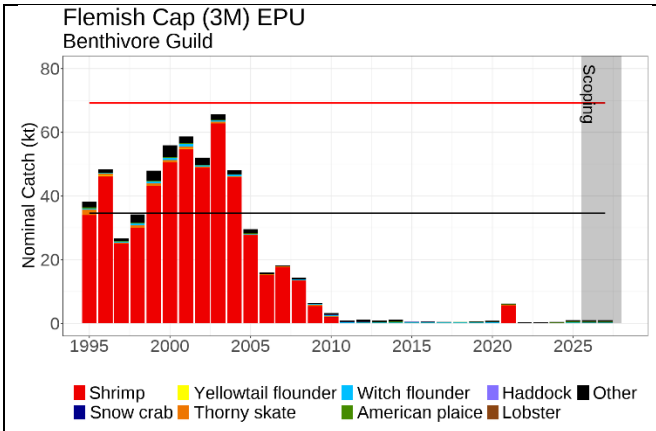
Piscivores Guild: intermediate risk of ecosystem overfishing

Current 2TCI=24kt

Catches are dominated by redfish, Greenland halibut and Atlantic cod.

Redfish (3M), Greenland halibut (2+3KLMNO) and Atlantic cod (3M) stocks are managed by NAFO.

Catches for 2026-2027 are scoped to be above the 2TCI Ecosystem Reference Point in 2026 and decline below it in 2027.



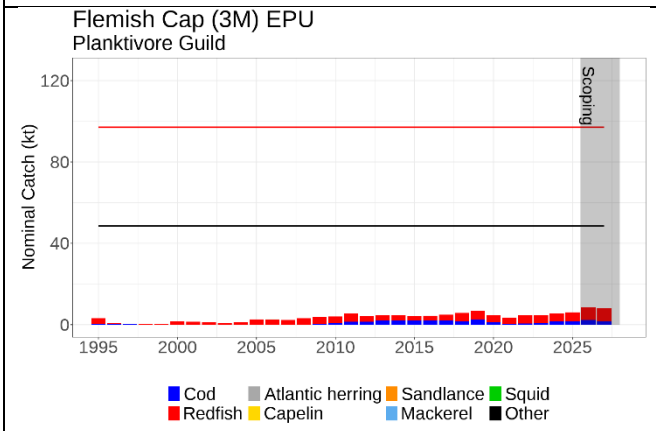
Benthivores Guild: low risk of ecosystem overfishing

Current 2TCI=69kt

Catches are dominated by shrimp.

Shrimp (3M) stock is managed by NAFO.

Catches for 2026-2027 are scoped to be below TCI.



Planktivore Guild: low risk of ecosystem overfishing

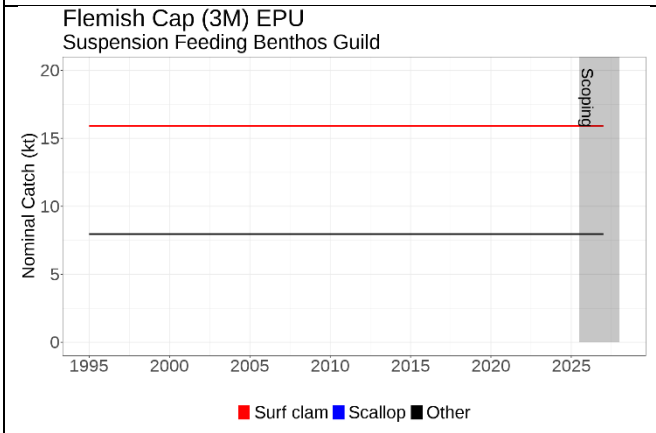
Current 2TCI=97kt

There are no fisheries directed to planktivores in this EPU.

Catches are dominated by younger ages of Atlantic cod and redfish.

A fraction of Atlantic cod and redfish catches is mapped to this functional guild to account for the planktivore production of these stocks during the early part of their life histories.

Catches for 2026-2027 are scoped to be below TCI.

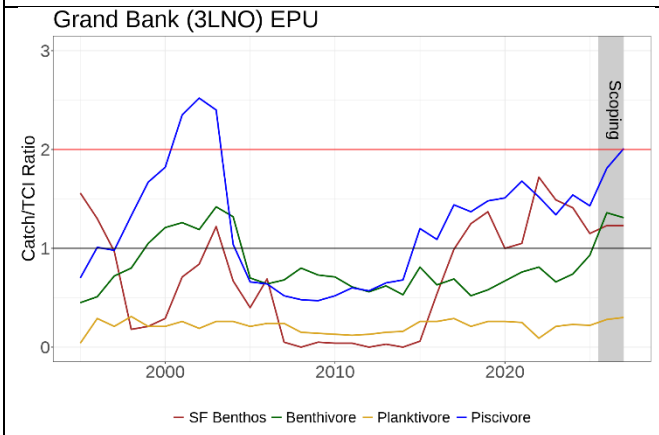


Suspension Feeding Benthos Guild: low risk of ecosystem overfishing

Current 2TCI=159kt

There are no fisheries directed to Suspension Feeding Benthos in this EPU.

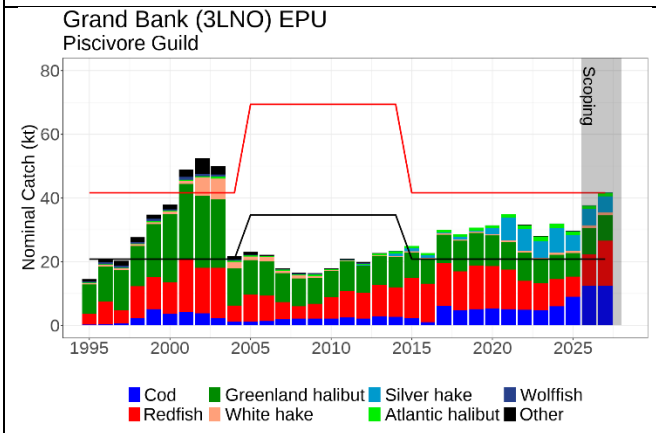
Grand Bank (3LNO) Ecosystem Production Unit (EPU)



Overview

2025 catches for all functional guilds were below 2TCI, indicating that fishing levels have been consistent with preventing a high risk of ecosystem overfishing.

Piscivore guild catches are scoped to be below the 2TCI Ecosystem Reference Point in 2026, and increase to the 2TCI level in 2027, which corresponds to a high risk of ecosystem overfishing.



Piscivores Guild: intermediate risk of ecosystem overfishing

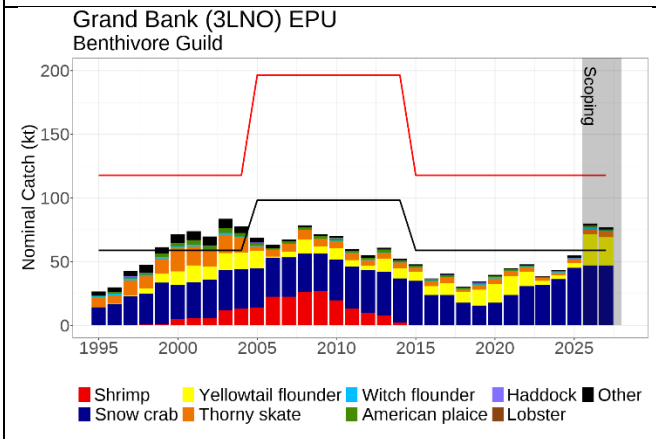
Current 2TCI=42kt

Catches are dominated by redfish, Greenland halibut, Atlantic cod, and silver hake.

Redfish (3LN and 3O stocks), Greenland halibut (2+3KLMNO) and Atlantic cod (3NO - moratorium) stocks are managed by NAFO, while the Atlantic cod (2J3KL) stock is managed by Canada.

Catches of silver hake have been increasing since 2018, likely linked to ecosystem changes related to warming trends. This increase indicates that a fishery on this species could be emerging.

Catches for 2026-2027 are scoped to be below the 2TCI Ecosystem Reference Point in 2026, and increase to the 2TCI level in 2027.



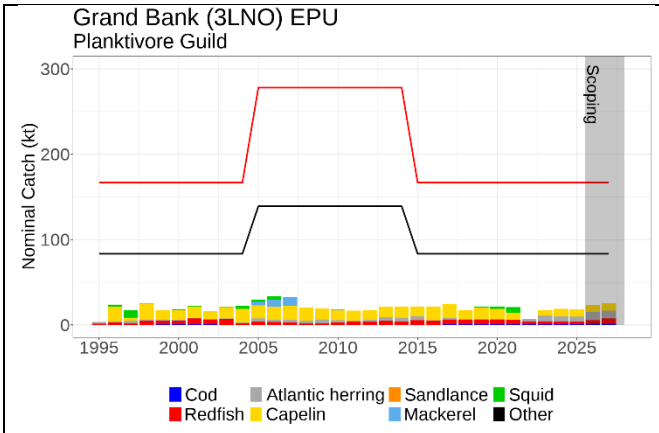
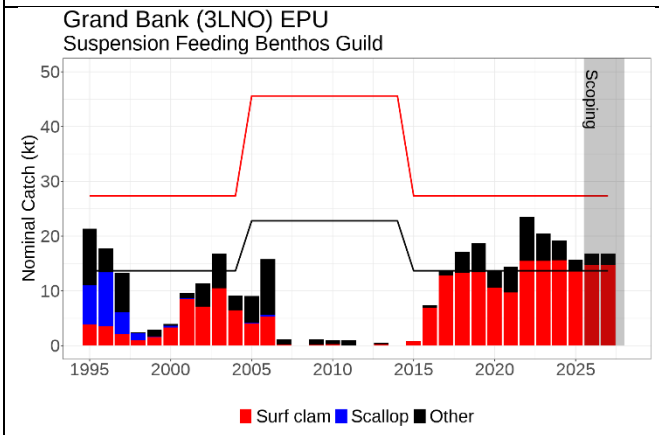
Benthivores Guild: low risk of ecosystem overfishing

Current 2TCI=118kt

Catches are dominated by yellowtail flounder and snow crab.

Yellowtail flounder (3LNO) is managed by NAFO, while the snow crab (3LNO) is managed by Canada.

Catches for 2026-2027 are scoped to be between 1 and 2 TCI.

	**Planktivore Guild: low risk of ecosystem overfishing** Current 2TCI=167kt Catches are dominated by capelin (2J3KL). Capelin (2J3KL) is a stock managed by Canada. A fraction of Atlantic cod and redfish catches is mapped to this functional guild to account for the planktivore production of these stocks during early part of their life histories. Catches for 2026-2027 are scoped to be below TCI.
	**Suspension Feeding Benthos Guild: intermediate risk of ecosystem overfishing** Current 2TCI=27kt Catches are dominated by surf clam. The surf clam fishery is managed by Canada. Catches for 2026-2027 are scoped to be between 1 and 2 TCI.

iii) Development of TCI app

As part of the implementation of Tier 1 of the NAFO Roadmap for an Ecosystem Approach to Fisheries, SC has developed a prototype application, provisionally named "TCI app", for a rapid and interactive evaluation of the impacts of candidate Total Allowable Catch (TAC) values on the risk of exceeding the 2TCI Ecosystem Reference Point. This application enables managers to input the TACs being considered for decisions in a given year, and see in real time what the impact of those options is on the scoped Catch/TCI ratios for the corresponding functional guild and EPU. The goal of the TCI app is to facilitate the evaluation and discussion by the Commission (COM) of the likely ecosystem impacts associated with alternative TAC options.

This prototype application will be presented at the 2026 WG-EAFFM meeting for consideration and initial feedback from managers. While next steps remain conditional to the input to be received at WG-EAFFM, SC intent would be to make this prototype application available to Contracting Parties' delegations at the 2026 NAFO Annual Meeting. The goal of this initial distribution aims at gathering feedback from managers about the TCI app, including its usability in real life conditions, user interface design, app features, and type and format of the information displayed. This feedback will be gathered through a companion questionnaire to be distributed with the app, and used to improve the final design of the TCI app.

If COM finds this application useful, once the app development process is completed, the TCI app is intended to become a companion tool to the standard SC advice, regularly updated and available to COM at the NAFO Annual Meeting.

d) Special Requests for Management Advice

i) Monitor the status of Greenland halibut in Subarea 2 + Divisions 3KLMNO annually to compute the TAC using the agreed Management Procedure and determine whether exceptional circumstances are occurring. If exceptional circumstances are occurring, the exceptional circumstances protocol will provide guidance on what steps should be taken (request #2, Commission priority).

Scientific Council responded:

The TAC for 2027 derived from the Management Procedure is 14 351 t. This is slightly lower than the TAC for 2026. This TAC is also less than the mean expectation from the projections during the last MSE review; it reflects the survey-based target and slope components of the MP, which indicate only limited recent improvement in the stock indices compared to the most likely situation forecast for the stock at the time of the review.

Scientific Council advises that Exceptional Circumstances are not occurring.

A Management Procedure (MP) for Greenland halibut in Subarea 2+Divs. 3KLMNO was adopted by the Commission in 2024. The MP combines a "target based" and "slope based" rule, detailed below. For the current TAC calculation, sufficient data are available to use all five survey indices in the MP (Table i.1). The full set of control parameters for the adopted MP are shown in Table i.2. All data inputs used to calculate the TAC for 2027 are shown in Table i.3.

Table i.1. Survey indices available for use in the most recently adopted MP.

	2021	2022	2023	2024	2025
Canada Autumn 2J3K	✓	✗	✓	✓	✓
Canada Autumn 3LNO	✗	✗	✓	✓	✓
EU-Spain 3L	✗	✗	✓	✓	✓
EU-Spain 3NO	✓	✓	✓	✓	✓
EU 3M 0-1400m	✓	✓	✓	✓	✓

*Target based (**t**)*

The target rule is:

$$\mathrm{TAC}_{y+1}^{target} = \mathrm{TAC}_y(1 + \gamma(J_y - 1)) \qquad (1)$$

where TAC_y is the TAC recommended for year y, γ is the "response strength" tuning parameter, J_y is a composite measure of the immediate past level in the mean weight per tow from surveys (I_y^i) that are available to use for calculations for year y; five survey series are used, with i = 1, 2, 3, 4, and 5 corresponding respectively to Canada Autumn 2J3K, Canada Autumn 3LNO, EU-Spain 3L, EU-Spain 3NO and EU 3M 0-1400m:

$$J_y = \sum_{i=1}^{5} \frac{1}{(\sigma^i)^2} \frac{J_{current,y}^i}{J_{target}^i} \Big/ \sum_{i=1}^{5} \frac{1}{(\sigma^i)^2} \qquad (2)$$

with $(\sigma^i)^2$ being the estimated variance for index i (estimated in the SCAA model fitting procedure),

$$J^i_{current,y} = \frac{1}{q}\sum_{y'=y-q}^{y-1} I^i_{y'} \quad (3)$$

$$J^i_{target} = \alpha\frac{1}{5}\sum_{y'=2011}^{2015} I^i_{y'} \quad \text{(where } \alpha \text{ is a control/tuning parameter for the MP)} \quad (4)$$

and q indicating the period of years used to determine current status. Note the assumption that when a TAC is set in year y for year $y+1$, indices will not at that time yet be available for the current year y. Missing survey values are treated as missing in the calculation using the rule, as was applied in the MSE testing. In such cases, q in equation (3) is reduced accordingly.

*Slope based (**s**)*

The slope rule is:

$$\mathrm{TAC}^{slope}_{y+1} = \mathrm{TAC}_y[1 + \lambda_{up/down}(s_y - X)] \quad (5)$$

where $\lambda_{up/down}$ and X are tuning parameters, s^i_y is a measure of the immediate past trend in the survey-based mean weight per tow indices, computed by linearly regressing lnI^i_y, vs year y' for $y' = y-5$ to $y' = y-1$, for each of the five surveys considered, with:

$$s_y = \sum_{i=1}^{5}\frac{1}{(\sigma^i)^2}s^i_y \Big/ \sum_{i=1}^{5}\frac{1}{(\sigma^i)^2} \quad (6)$$

with the standard error of the residuals of the observed compared to model-predicted logarithm of survey index i (σ^i) as estimated in the SCAA base case operating model. Missing survey values are treated as missing in the calculation using the rule, as was applied in the MSE. In such cases, the slope for each index, s^i_y, in equation (6) is calculated from the available values within the last five years.

*Combination Target and Slope based (**s+t**)*

For the target and slope based combination:

1) $\mathrm{TAC}^{target}_{y+1}$ is computed from equation (1),
2) $\mathrm{TAC}^{slope}_{y+1}$ is computed from equation (5), and
3) $\mathrm{TAC}_{y+1} = \mu(\mathrm{TAC}^{target}_{y+1} + \mathrm{TAC}^{slope}_{y+1})/2$, where μ is a tuning parameter.

Finally, constraints on the maximum allowable annual change in TAC are applied, viz.:

$$\text{if} \quad \mathrm{TAC}_{y+1} > \mathrm{TAC}_y(1+\Delta_{up}) \quad \text{then} \quad \mathrm{TAC}_{y+1} = \mathrm{TAC}_y(1+\Delta_{up}) \quad (7)$$

and

$$\text{if} \quad \mathrm{TAC}_{y+1} < \mathrm{TAC}_y(1-\Delta_{\mathrm{down}}) \quad \text{then} \quad \mathrm{TAC}_{y+1} = \mathrm{TAC}_y(1-\Delta_{\mathrm{down}}) \quad (8)$$

During the MSE process, this inter-annual constraint was set at 10%, for both TAC increases and decreases, and these constraints were adopted as part of the adopted MP.

Following the MP using the agreed survey data, the recommended TAC for 2027 is 14 351 t (Table i.3). This is slightly lower (<1% different) than the TAC for 2026 of 14 729 t. This TAC is also less than the mean expectation from the projections during the last MSE review; it reflects the survey-based target and slope components of the MP, which indicate only limited recent improvement in the stock indices compared to the most likely situation forecast for the stock at the time of the review (Figs. i.1, i.2, and i.3).

Table i.2. Control parameter values for the adopted MP. The parameters μ, α, and X were adjusted to achieve a median biomass equal to B_{msy} for the exploitable component of the resource biomass in 2044 for the Base Case SCAA Operating Model.

μ	0.963
γ	0.15
q	3
α	0.972
λ_{up}	1
λ_{down}	2
X	-0.0056
Δ_{up}	0.1
Δ_{down}	0.1

Table i.3. Data used in the calculation of the TAC for 2027. The weights given to each survey in obtaining composite indices of abundance (target rule) and composite trends (slope rule) are proportional to the inverses of the squared values of the survey error standard deviations σ^i listed below.

	Canada Autumn 2J3K	Canada Autumn 3LNO	EU-Spain 3L	EU-Spain 3NO	EU 3M 0-1400m
2011	26.736	2.206	14.614	7.093	26.152
2012	23.504	1.712	14.674	7.373	19.198
2013	29.792	2.531	17.312	5.463	19.110
2014	33.336		24.090	6.239	23.921
2015	22.290	0.869	23.897	9.486	47.517
2016	18.541	1.314	21.265	8.796	28.298
2017	15.104	1.246	34.828	16.627	42.665
2018	17.054	1.887	21.747	7.875	29.803
2019	16.285	1.872	29.695	8.824	16.887
2020	15.840	2.714			13.230
2021	21.153			8.090	16.310
2022				10.284	13.492
2023	19.972	1.736	23.797	10.926	27.457
2024	35.880	1.930	24.618	7.922	20.615
2025	23.718	1.562	22.478	6.342	20.650
s^i_{2026}	0.0698	-0.0528	-0.0285	-0.0748	0.0896
$J^i_{current,2026}$	26.523	1.743	23.631	8.397	22.907
J^i_{target}	26.372	1.778	18.388	6.931	26.418
σ^i	0.230	0.254	0.239	0.405	0.299
$1/(\sigma^i)^2$	18.904	15.500	17.507	6.097	11.186
		TAC_{2026}	14 729 t	TAC^{target}_{2027}	14 876 t
		s_{2026}	0.0079	TAC^{slope}_{2027}	14 928 t
		J_{2026}	1.066	TAC_{2027}	14 351 t

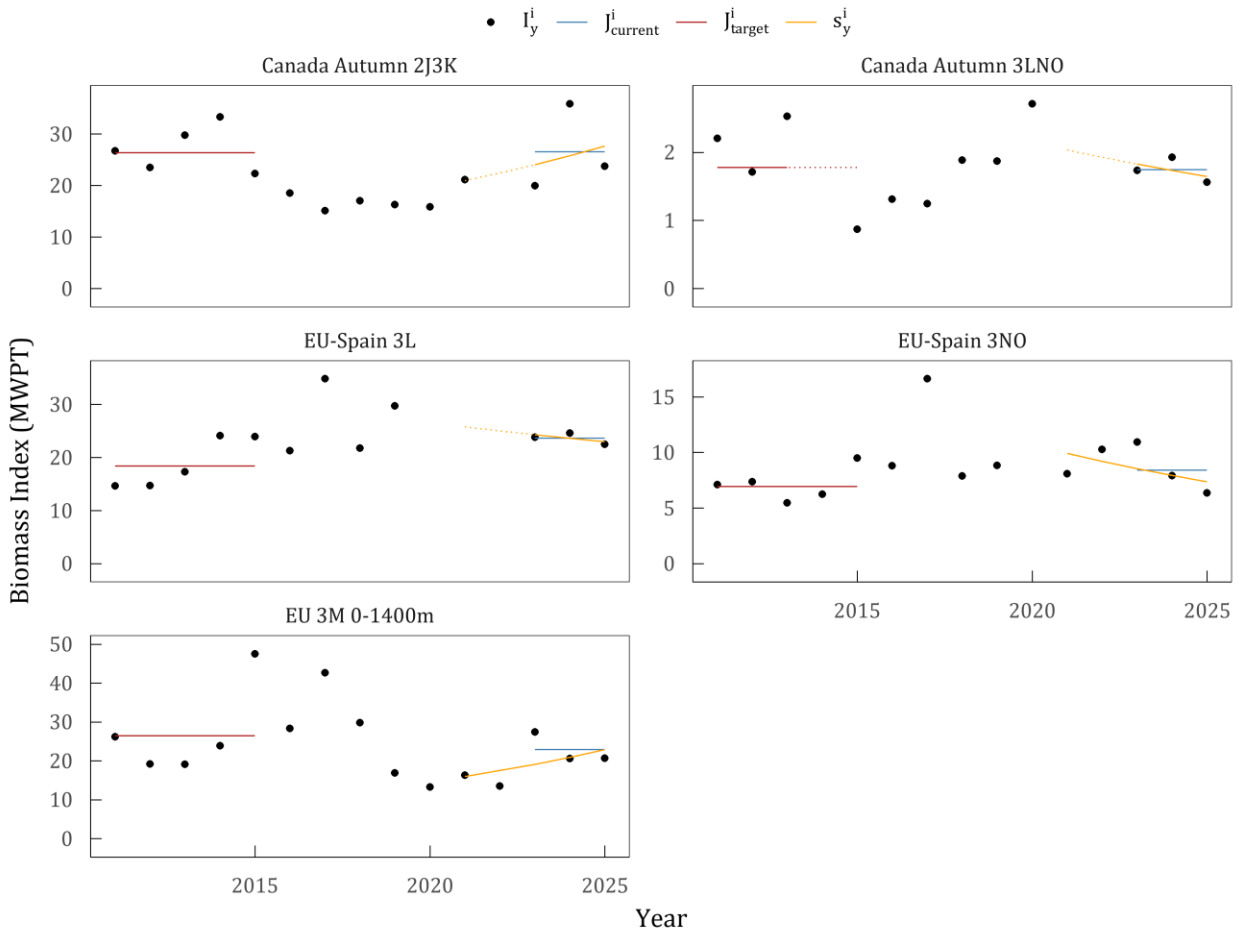


Figure i.1. Input for the Greenland halibut in Subarea 2 + Divs. 3KLMNO MP along with visual representation of the target and slope based components of the rule. The red line represents the target (2011-2015 average; J^i_{target}), the blue line the current levels (2023 - 2025 average; $J^i_{current}$), and the orange line depicts recent log-linear trends (2021 - 2025 slope; s^i_y). Survey data are from Canadian Autumn surveys in Divs. 2J3K, Canadian Autumn surveys in Divs. 3LNO, EU-Spain surveys in Div. 3L, EU-Spain surveys in Divs. 3NO, and EU Flemish Cap surveys (to 1400m depth) in Div. 3M. Missing values within the last five years are not used in the calculation of the composite measure of the immediate past level and slope for the TAC calculation using the MP; dotted lines indicate interpolated values across missing periods for visualization only.

Exceptional Circumstances

In 2026, the SC evaluated each of the criteria indicated in the Exceptional Circumstances Protocol, as described below.

The following criteria provide the basis to determine whether Exceptional Circumstances apply:

1. Missing survey data:

- *More than two values missing, in a five-year period, from a survey used in the MP;*
- *Missing more than two of the five survey indices from the terminal year*[1]*.*

[1] Terminal year refers to the most recent year with survey data, currently 2025.

SC notes that the Canadian Autumn 2J3K survey was incomplete in 2025 and that missed areas are inhabited by Greenland halibut. However, the areas covered were similar in 2019, when the missed strata had minimal impact on the mean weight per tow indices used in the Harvest Control Rule (HCR) (SCR Doc. 20/004). Consistent with the decision to include the 2019 index, SC agreed to include the 2025 Canadian Autumn 2J3KL index in the MP calculation. Therefore, Exceptional Circumstances do not presently arise from missing survey data.

2. The composite survey index used in the MP, in a given year, is above or below the 90 percent probability envelopes projected by the base case operating models from SSM and SCAA under the MS.

The composite survey index for 2026 falls within the 90% probability envelopes from the base case SCAA and SSM operating models (Figs. i.2 and i.3). SC concludes that this does not constitute Exceptional Circumstances.

3. TACs are established that are not generated from the MP.

The TAC established for 2026 was generated from the MP adopted in 2024. This does not constitute Exceptional Circumstances.

The following elements will require application of expert judgment to determine whether Exceptional Circumstances are occurring:

1. the five survey indices relative to the 80, 90, and 95 percent probability envelopes projected by the base case operating models (SSM and SCAA) for each survey;

Nearly all survey indices obtained since 2023 were within the 95% probability envelopes of both the SCAA and SSM base-case operating models (28 of 30 comparisons), and most were within the 80% envelopes (19 of 30; Figs. i.2 and i.3). SC concludes that this does not constitute occurrence of Exceptional Circumstances.

2. survey data at age four (the age before recruitment to the fishery) compared to its series mean to monitor the status of recruitment;

All available recruitment indices indicate that the 2021 year class was below average. While this warrants continued monitoring, it is not currently considered an Exceptional Circumstance (Fig. i.4).

3. discrepancies between catches and the TAC calculated using the MP.

The TAC for 2025 was 14 791 t. The catch in 2025 was 14 513 t (<2% difference). SC concludes that this does not constitute Exceptional Circumstances as catches have been tracking the MP outputs closely (Fig. i.5).

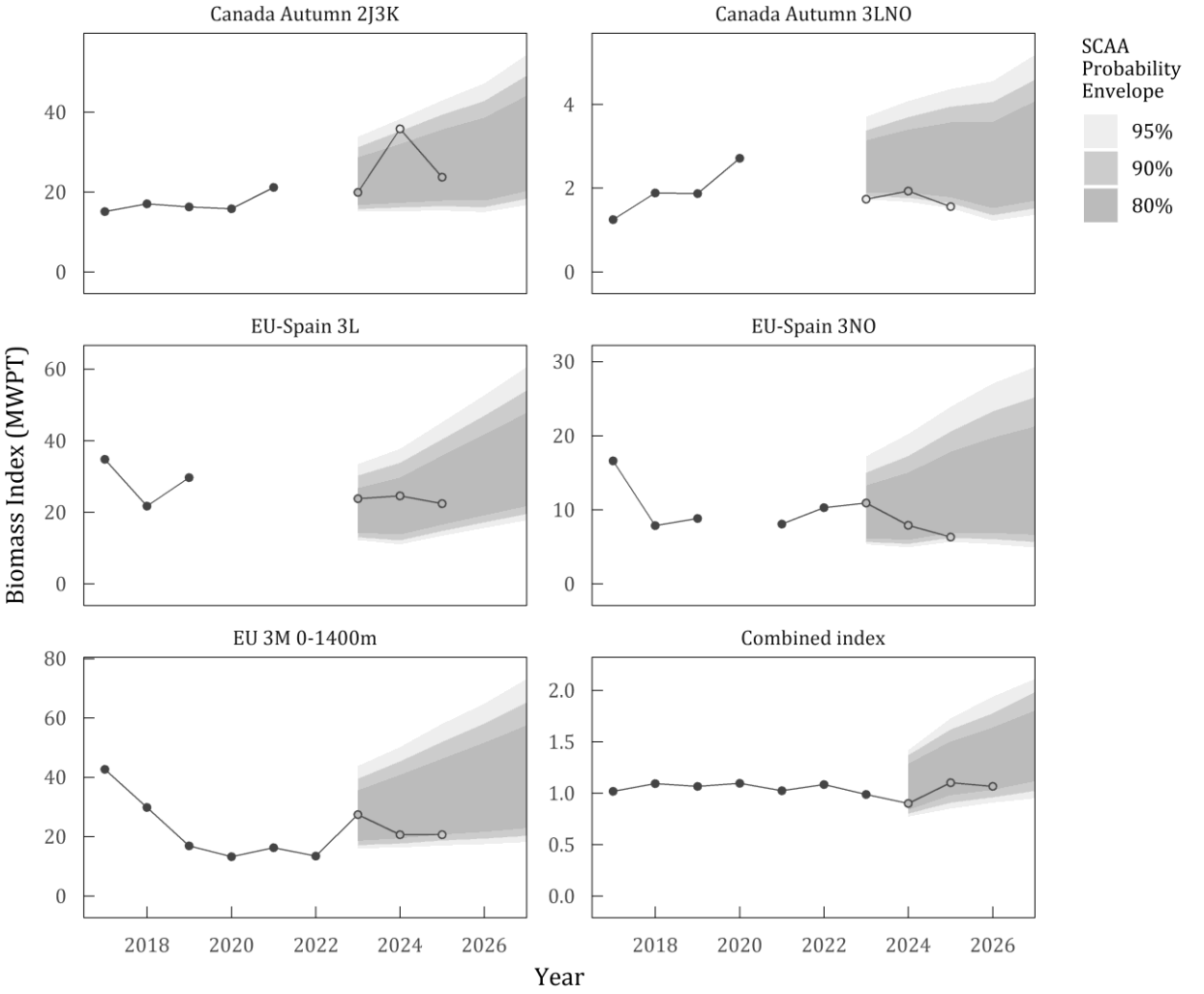


Figure i.2. Greenland halibut in Subarea 2 + Divs. 3KLMNO. Mean weight per tow from Canadian Autumn surveys in Divs. 2J3K, Canadian Autumn surveys in Divs. 3LNO, EU-Spain surveys in Div. 3L, EU-Spain surveys in Divs. 3NO and EU Flemish Cap surveys (to 1400m depth) in Div. 3M. The figure also shows the combined index[2] used in the target based component of the MP. For the survey and combined indices, 80%, 90% and 95% probability envelopes from the **SCAA** base case simulation are shown. Index values observed from 2023 onward are shown using open circles.

[2] The probability envelopes for the combined index (shaded regions) includes the EU-Spain 3L series: however, the observed combined index (point) for 2024 and 2025 excludes the EU-Spain 3L series.

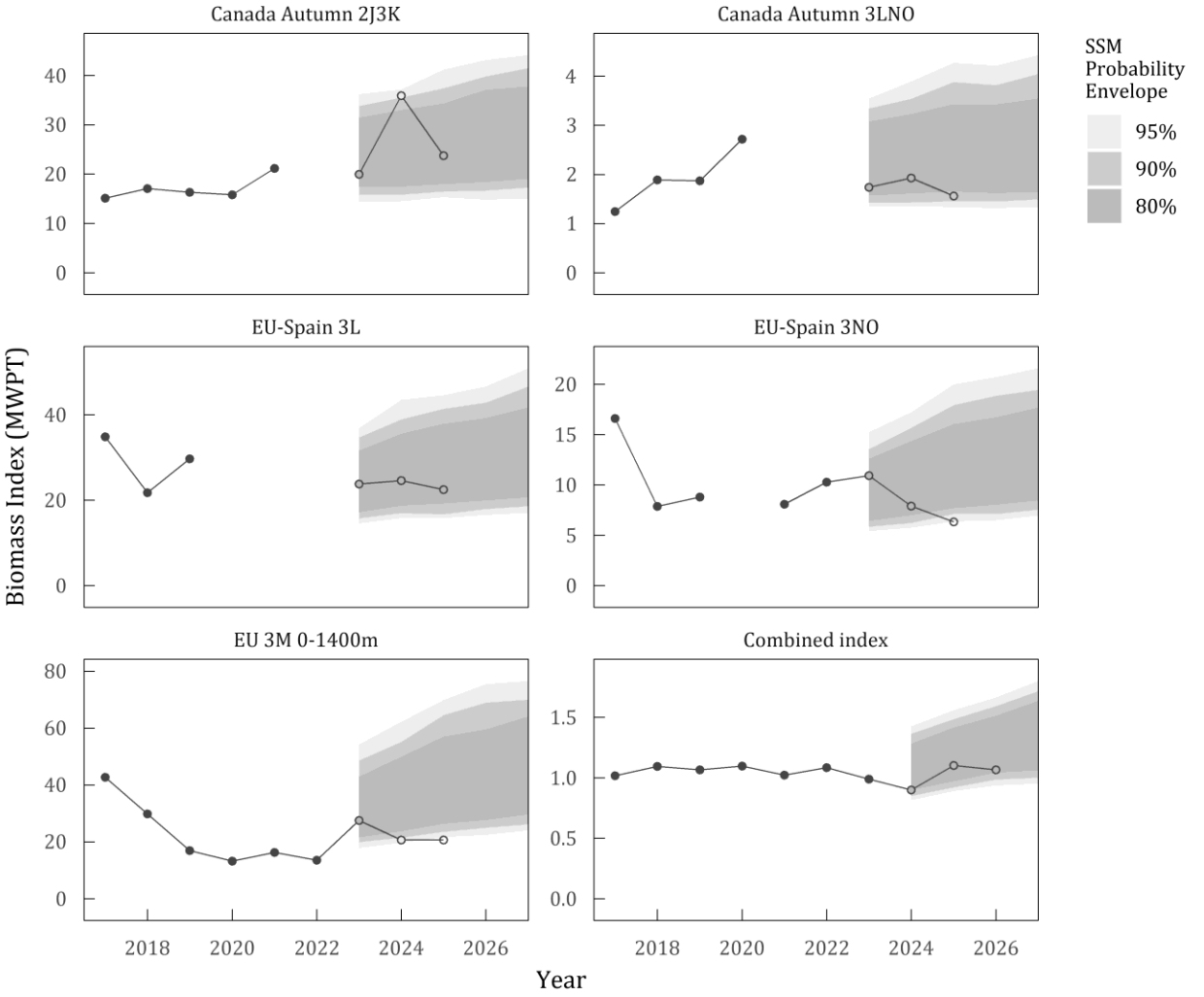


Figure i.3. Greenland Halibut in Subarea 2 + Divs. 3KLMNO. Mean weight per tow from Canadian Autumn surveys in Divs. 2J3K, Canadian Autumn surveys in Divs. 3LNO, EU-Spain surveys in Div. 3L, EU-Spain surveys in Divs. 3NO, and EU Flemish Cap surveys (to 1400m depth) in Div. 3M. The figure also shows the combined index[2] used in the target based component of the MP. For the survey and combined indices, 80%, 90% and 95% probability envelopes from the **SSM** base case simulation are shown. Index values observed from 2023 onward are shown using open circles.

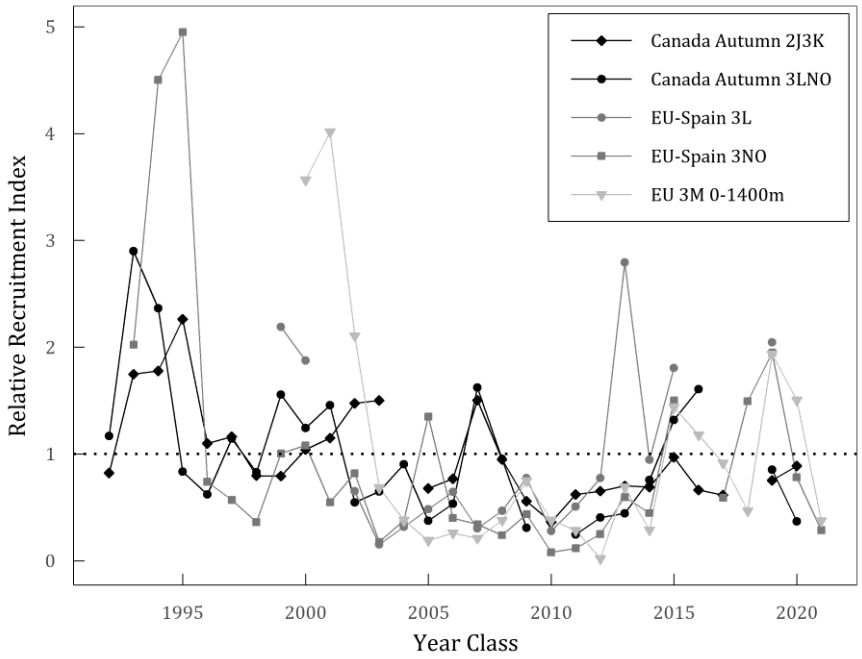


Figure i.4. Greenland halibut in Subarea 2 + Divs. 3KLMNO. Relative recruitment (age 4) indices, shown in relation to year class, from Canadian Autumn surveys in Divs. 2J3K, Canadian Autumn surveys in Divs. 3LNO, EU-Spain survey in Divs. 3NO, EU-Spain in Div. 3L, and EU survey of Flemish Cap. Each series is scaled to its average, which then corresponds to the horizontal dotted line at 1.

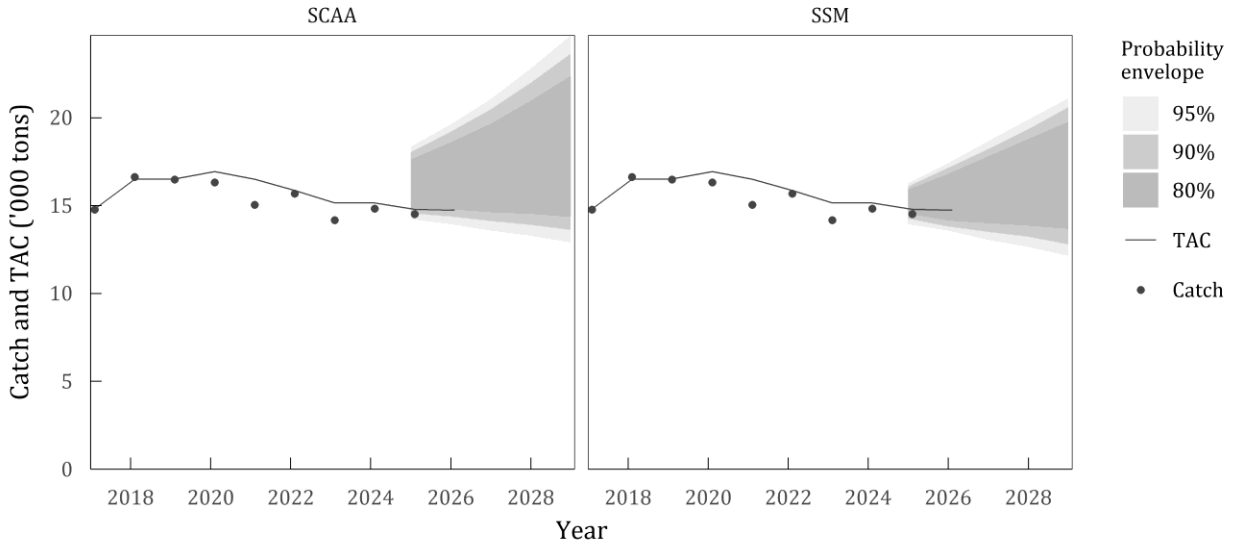


Figure i.5. Greenland halibut in Subarea 2 + Divs. 3KLMNO: TACs and catches. The figure also shows 80%, 90% and 95% probability envelopes from the **SCAA** and **SSM** base case simulation projections of future TACs.

References

Rideout, R.M., 2020. Do spatial coverage issues in the 2019 Canadian (NL) RV bottom trawl surveys influence the suitability of survey indices for use in NAFO stock assessments? NAFO SCR Document 20/004.

ii) Continue to advance work on the 3LN redfish MSE processes during 2025-2026 (request #3, Commission priority).

Scientific Council responded:

Scientific Council notes that efforts have been made to explore the feasibility of a Management Strategy Evaluation (MSE) for 3LN redfish since 2023.

Scientific Council considers that it is worthwhile to continue to explore the development of operating models for an MSE of the 3LN redfish stock, but advances on this will be subject to resource availability and work prioritization. SC reiterates that benchmark processes are considered a higher priority than MSE at this time. SC will continue evaluating the progress made to assess whether sufficient advances in data, understanding and modelling can support a viable MSE process for 3LN redfish as work progresses.

During the 2025 SC June meeting, SC considered that it was worthwhile to continue to explore the development of operating models (OMs) for an MSE of the 3LN redfish stock, taking into account that it remains a difficult stock for which to develop an operating model. A subgroup was constituted to explore these options, while also providing guidance to this group on the key aspects that needed to be addressed (SCS 25/13).

The subgroup presented its additional work at the June 2026 SC meeting to obtain guidance on how the work should proceed. While showing clear progress on some of the identified shortcomings (e.g. a model that includes a recruitment pulse to represent episodic recruitment, and a series of models that include an environmental covariate to capture changes in productivity over time), this additional work is as yet unable to adequately reproduce the full 2010-2015 increases in survey indices, and the potential implications of considering the juvenile vs adult split for the modelling of the stock dynamics has yet to be investigated.

These recent results, together with the collective body of work completed to date, indicate that progressing to an MSE for this stock remains challenging from a scientific standpoint.

The stock is characterized by substantial uncertainty in the understanding and modeling of its biology and population dynamics, including species mixing, episodic recruitment pulses and historical data. MSE is an internationally recognized framework designed specifically to evaluate harvest strategies in the presence of such uncertainties, and would be expected to provide a better basis for robust management advice than a single assessment model.

Accordingly, SC considers that it is still worthwhile to continue to explore the development of operating models for an MSE of the 3LN redfish stock, but advances on this will be subject to resource availability and work prioritization. SC reiterates that benchmark processes are considered a higher priority than MSE at this time. SC will continue evaluating the progress made to assess whether sufficient advances in data, understanding and modelling can support a viable MSE process for 3LN redfish as work progresses.

References

NAFO, 2025. Report of the Scientific Council Meeting, 29 May -12 June 2025 Halifax, Nova Scotia. NAFO SCS Document, 25/13.

iii) Develop stock summary sheets for NAFO managed stocks that are evaluated using MSE processes (request #4).

Scientific Council responded:
Scientific Council has developed an initial example Stock Summary Sheet for an MSE-managed stock, using Greenland halibut in Subarea 2 + Divisions 3KLMNO. Further development and implementation will be based on Commission feedback on this example and will depend on Scientific Council capacity.

Scientific Council has developed an example summary sheet for an MSE-managed stock, using Greenland halibut in Subarea 2 + Divisions 3KLMNO as an example. The example follows the general style of existing NAFO stock summary sheets, but has been adapted for the MSE paradigm.

Scientific Council notes that the summary sheet could provide a concise front-end for advice currently communicated through the response to Commission Request #2. However, the technical details supporting the TAC calculation and Exceptional Circumstances evaluation will still need to be documented.

The aim of Scientific Council is to update the summary sheets of the MSE-managed stocks every year.

Scientific Council requests guidance from the Commission for adoption of this summary sheet and on how it wishes to receive advice for stocks managed using adopted Management Procedures. Options include:

1. retaining the current reporting approach, without producing a summary sheet as a communication product;
2. incorporating MSE-managed stocks into the regular advice request (Commission Request #1), with technical details provided in the STACFIS report and advice communicated through a summary sheet; or
3. communicating advice through the summary sheet and the status of the stock via the STACFIS report, with technical details on the TAC calculation and Exceptional Circumstances evaluation provided under a simplified Commission Request #2.

The initial example summary sheet for an MSE-managed stock for Greenland halibut in Subarea 2 + Divisions 3KLMNO is as follows:

Greenland Halibut in Subarea 2 + Divs. 3KLMNO Advice June YEAR for YEAR

Recommendation for YEAR (the advice below is an example of potential advice)

The TAC for YEAR for 2+3KLMNO Greenland halibut derived from the Management Procedure is VALUE t.

SC advises that Exceptional Circumstances are XXX.

Management approach

Greenland halibut in Subarea 2 and Divs. 3KLMNO is managed using a Management Procedure (MP) adopted by the Commission in YEAR. The MP generates TAC advice using survey-based indicators of stock level and trend.

The MP was selected through Management Strategy Evaluation (MSE). During the MSE, Candidate Management Procedures (CMPs) were tested against agreed Management Objectives under a broad range of possible stock, fishery, and survey scenarios.

The MP adopted combines a target-based rule and a slope-based rule. The target-based component responds to whether recent survey levels are above or below target levels, while the slope-based component responds to whether recent survey trends are increasing or decreasing. The combined rule averages the target-based and slope-based TAC calculations, with a 10% constraint on inter-annual TAC increases and decreases.

Management objectives

The following Management Objectives have been specified for this stock:

Restore to within a prescribed period of time or maintain at B_{msy}.
The risk of failure to meet the B_{msy} target and interim biomass targets within a prescribed period of time should be kept moderately low.
Low risk of exceeding F_{msy}.
Very low risk of going below an established threshold.
Maximize yield in the short, medium and long term.
The risk of steep decline of stock biomass should be kept moderately low.
Keep inter-annual TAC variation below an established threshold.

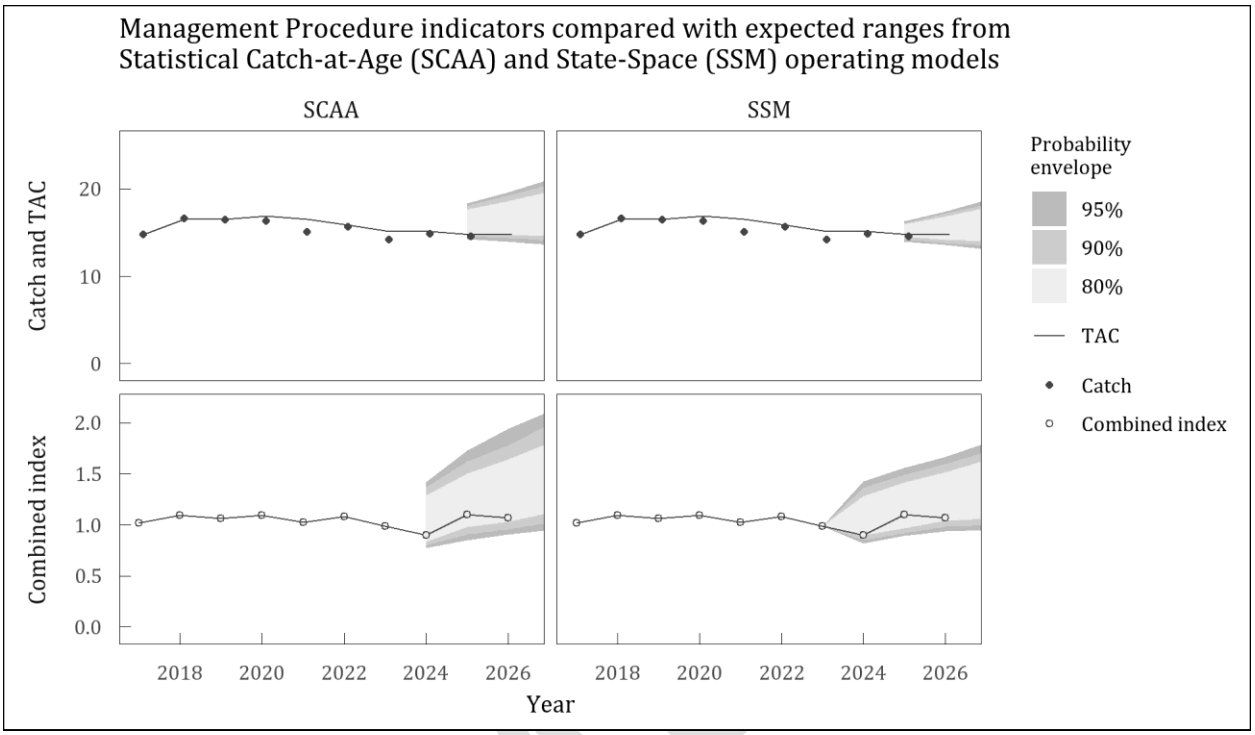
The adopted MP was selected as it was projected to meet these objectives across a broad range of tested conditions.

Management unit

The Greenland halibut stock occupying Subarea 2 and Divs. 3KLMNO is considered to be a separate population.

Management Procedure progression

The MP remains applicable for the current TAC calculation. Scientific Council evaluated the criteria in the Exceptional Circumstances Protocol and advises that Exceptional Circumstances are not occurring.



Evaluation of Exceptional Circumstances Protocol

Criterion	Status	Comment
Missing survey data	✓	All five survey indices had sufficient recent data to be included in the MP. The YEAR Canadian Autumn 2J3K survey was incomplete, but Scientific Council agreed to include the index in the MP calculation.
Composite survey index	✓	The composite survey index falls within the VALUE% probability envelopes from both base-case operating models.
TAC generated from MP	✓	The TAC established for YEAR was generated from the MP adopted in YEAR.
Individual survey indices	✓	Nearly all survey indices obtained since YEAR were within the VALUE% probability envelopes of both base-case operating models, and most were within the VALUE% envelopes.
Recruitment	⚠	All available recruitment indices indicate that the YEAR class was below average. This warrants continued monitoring but is not currently considered an Exceptional Circumstance.
Catch relative to TAC	✓	The TAC for YEAR was VALUE t. The catch in YEAR was VALUE t.
Overall status	✓	Scientific Council advises that Exceptional Circumstances are not occurring.

Assessment

The MSE was based on two core operating model frameworks: an age-structured statistical catch-at-age model (SCAA) and a state-space model (SSM). CMPs were tested across 14 operating model scenarios representing alternative assumptions about the stock, fishery, surveys, recruitment, natural mortality, selectivity and TAC implementation. Most scenarios were evaluated under both the SCAA and SSM frameworks.

The next update of the base-case operating models is scheduled for YEAR, inline with the scheduled review of the MP.

Human impacts

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

Biological and environmental interactions

2+3KLMNO Greenland halibut stock extends over multiple Ecosystem Production Units (EPUs), including the Labrador Shelf (2GH), the Newfoundland Shelf (2J3K), and the Grand Bank (3LNO) within the Newfoundland-Labrador (NL) Bioregion, and the Flemish Cap (3M) EPU within the Flemish Cap Bioregion. Greenland halibut diet varies over the stock area and over time, but common prey items include shrimp, small forage fishes (e.g. capelin, sandlance), squid and redfish.

The NL Bioregion continues experiencing low productivity conditions, with EPU biomasses below pre-collapse levels (pre-1990s). Rebuilding was observed since the 1990s, but declines occurred across EPUs in the mid 2010s. Positive signals have been observed since these declines, with EPU biomasses generally near or approaching post-collapse highs in recent years.

The Flemish Cap EPU, with the exception of a short-lived increase in 2005-2009, has shown a fairly stable total biomass over time despite the changes in individual stocks. This indicates no major changes in overall ecosystem productivity.

Ecosystem sustainability of catches

The impact of bottom fishing activities on 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. Some areas in the Grand Bank (3LNO) EPU, and a number of areas in the Flemish Cap (3M) EPU have been closed to bottom fishing to protect VMEs.

2+3KLMNO Greenland halibut is included in the piscivores guild. In the Grand Bank (3LNO) EPU other NAFO managed stocks within this guild include Divs. 3LN and 3O redfish, 3NO cod, and 3NOPs white hake. The Catch/TCI for YEAR in this EPU was below the 2TCI ecosystem reference point (3LNO Piscivore $Catch_{YEAR}$/TCI=VALUE).

In the Flemish Cap (3M) EPU other NAFO managed stocks within the piscivores guild include 3M redfish and 3M cod. The Catch/TCI for YEAR in this EPU was below the 2TCI ecosystem reference point (3M Piscivore $Catch_{YEAR}$/TCI=VALUE).

Fishery

Greenland halibut in Subarea 2 and Divs. 3KLMNO are caught in directed mobile-gear and fixed-gear fisheries, including bottom trawl, gillnet, and longline fisheries. The fishery is regulated by TAC. TACs for 2018–2024 were based on the MP adopted in 2017, while TACs from 2025 onward are based on the MP adopted by the Commission in 2024.

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

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
TAC	VALUE	VALUE	VALUE	VALUE	VALUE	VALUE	VALUE	VALUE	VALUE	VALUE
Catch[1]	VALUE	VALUE	VALUE	VALUE	VALUE	VALUE	VALUE	VALUE	VALUE	--

[1]CESAG estimates

Sources of information

SCS Doc. XX/nn; SCR Doc. XX/nnn; FC Doc. XX/mm; COM Doc XX/mmm.

iv) Develop a reference document detailing the ecosystem roadmap, for completion by the 2026 Annual Meeting (request #5).

Scientific Council responded:

The NAFO Roadmap for an Ecosystem Approach to Fisheries (EAF) is the framework NAFO is following to deliver on the NAFO Convention commitment to implement an ecosystem approach for the management of fisheries resources. Although this framework has been described and/or acknowledged in multiple NAFO documents, there is no single, formally adopted document by the Commission that provides a detailed description of the Roadmap.

The Scientific Council has produced a document describing the Roadmap. This revised version incorporates the feedback received from managers on the preliminary draft circulated at WG-EAFFM in 2025.

This Roadmap document will be tabled for discussion at the 2026 WG-EAFFM meeting and is intended to be the basis for a submission to the Commission at the 2026 NAFO annual meeting for possible adoption.

The NAFO Roadmap for an Ecosystem Approach to Fisheries (EAF) is the framework NAFO is following to deliver on the NAFO Convention commitment to implement an ecosystem approach for the management of fisheries resources. This framework has been described and/or acknowledged in multiple NAFO documents and it has a broad presence and influence on NAFO work. Despite that, there is no NAFO document formally adopted by Commission (COM) that provides a detailed description of the Roadmap in a single reference document.

To address this, COM requested in 2024 for SC to develop a reference document detailing the ecosystem roadmap, with a timeline of 1-3 years for the delivery of the requested document. SC expedited the production of a preliminary draft of the Roadmap document, and tabled it at the 2025 WG-EAFFM meeting to engage and seek feedback from managers on the content and structure of the document.

The preliminary draft document was structured in three sections focused on:

- Policy context. This section described the NAFO Convention and related policy instruments that articulate the concepts and commitment to EAF.
- General structure of the Roadmap. This section provided a conceptual description of the framework based on the summary included in the 2024 WG-EAFFM Report, the 2019 primary publication, and the many descriptions on the Roadmap available across NAFO documents.
- Current implementation. This section provided a summary description of the pieces of the Roadmap already implemented and currently in development, with indications on how these pieces support the NAFO decision-making process (i.e. making explicit the linkages between tools and intended outcomes).

Feedback on this draft document was received at the 2025 WG-EAFFM meeting, as well as through written comments from CPs submitted to SC prior to the 2025 NAFO Annual Meeting. Additional comments and clarifications were gathered during the 2025 NAFO Annual Meeting.

The overall feedback from managers on the preliminary draft document was positive, and included a series of specific suggestions that ranged from content to editorial. The main elements of this feedback were:

- Removal of the “Current implementation” section. The content of this section was deemed useful, but considered to be potentially too dynamic for a framework to be adopted by COM, which is expected to have a degree of stability over time.
- Emphasize the adaptive nature of the Roadmap. While the draft already included this idea, managers indicated that a more explicit indication that the Roadmap is not intended as a prescriptive approach would be useful.

- Include a more explicit reference to climate change. The Roadmap already includes and considers climate change, but in light of the recent COM Resolution 2/23 (COM Doc. 23-13), managers indicated that a stronger reference to climate change within the documents was warranted.
- Revise the document to ensure that the quotes of the NAFO Convention fully respect the original text, and intent.

All of the above elements were addressed in the revised version of the document. The implementation section was removed from the document, and its content summarized in SCR 25/049. The other comments were explicitly addressed in the revised version, and the language suggestions put forward by managers were used as basis for some of the edits included in the final document produced by SC.

This Roadmap document will be tabled for discussion at the 2026 WG-EAFFM meeting and is intended to be the basis for a submission to the COM at the 2026 NAFO annual meeting for possible adoption as the framework guiding NAFO on the implementation of EAF.

References

NAFO, 2023. Addressing the Impact of Climate Change on NAFO Fisheries. NAFO COM/Doc. 23-13.

Koen Alonso, M., 2025. The Northwest Atlantic Fisheries Organization (NAFO) Roadmap for an Ecosystem Approach to Fisheries: A summary of its implementation and level of development as of December 2025. NAFO SCR Doc. 25/049.

v) Continue the development of a centralized data repository using ArcGIS online to host the data and data-products for scientific advice, in conjunction with the NAFO Secretariat (request #6a).

Scientific Council responded:

Scientific Council noted progress in development of the centralized ArcGIS Online repository and supported further work to improve data accessibility, traceability, and reproducibility. Priorities included retention of published layers with appropriate metadata, refinement of metadata and tagging standards, maintenance of workflow documentation, clarification of license management, and further development of Research Vessel trawl data request templates. Scientific Council also emphasized appropriate recognition of data contributors and the drafting of standard acknowledgement text.

WG-ESA reviewed uploaded data layers to ArcGIS Online and supported prioritising layers for the upcoming SAI reassessment, with a subsequent focus on archiving historical versions to maintain data lineage. It was agreed that all published data layers should be retained, including those later found to contain errors, with appropriate metadata flags to indicate their limitations. The use of tags to improve searchability (e.g. by SAI assessment year) was also recommended.

The WG-ESA considered the standard metadata form effective, noting the need to balance completeness and usability. Inclusion of key information such as measurement units was encouraged, while recognising that metadata requirements may vary by data type.

The ArcGIS StoryMap developed to document workflows was considered valuable and should be maintained and updated as required. Licensing arrangements were clarified, with Viewer Licences to be managed centrally by the Secretariat.

SC noted the extensive discussion by WG-ESA (SCS Doc. 25/16) on Research Vessel (RV) trawl data requests which highlighted the need to refine the draft template, including clearer definitions in the Data Dictionary and alignment with data provider formats. SC agreed that full time-series datasets should be requested to preserve reproducibility, while acknowledging challenges in tracking post-processing changes. Broad data requests, clear articulation of intended use, and appropriate access controls for pre-processed data are recommended.

The importance of recognising data providers was emphasised, with support for standardised acknowledgement text and consideration of co-authorship where appropriate.

SC endorsed plans for continued intersessional work, including refinement of metadata standards, ongoing data uploads, licence management documentation, further development and testing of RV trawl data request mechanisms, and drafting of standard acknowledgement text.

References

NAFO, 2025. Report of the Scientific Council Working Group on Ecosystem Science and Assessment, 4 - 12 November 2025, Madrid, Spain. NAFO SCS Doc. 25/16.

vi) Work towards the reassessment of VMEs and impact of bottom fisheries on VMEs for 2027; including potential management options in the reassessment of bottom fisheries (request #6b).

Scientific Council responded:

Scientific Council updated the delineation of VMEs in the NRA using data from the research vessel surveys conducted between 1995-2024. The general areas of the updated VMEs are highly consistent with prior analyses. SC notes the estimated areas of most VME functional groups increased relative to the 2019 assessment, with Large Gorgonian Corals and Black Corals showing comparatively little change. The largest increase was observed for Small Gorgonian Corals, which also identified new polygons on the Flemish Cap, some of which overlap with existing closures and thereby increase their conservation value. Despite these changes in estimated area, there was high spatial congruence between the 2019 and 2025 analyses.

Scientific Council agreed to a workplan for the 2027 reassessment of SAI and associated management options for NAFO bottom fisheries. Scientific Council also noted that, due to changes in available resources after the 2025 WG-ESA meeting, several of the secondary SAI indicators used in the 2021 SAI assessment cannot be updated for the 2027 assessment. However, the primary SAI indicators (proportion of VME protected, VME at risk and VME impacted) will be recalculated using the newly updated VME and fishery effort data sets, and used in the 2027 assessment of SAI and management options. The 2021 assessment showed that considering secondary SAI metrics did not change the overall outcome of the assessment from when it was conducted solely on the basis of primary SAI metrics, but secondary metrics were useful to further consolidate the assessment results.

The current planning and delivery are highly dependent on the location and format of the 2026 WG-ESA meeting.

Reassessment of VMEs

SC has completed the reassessment of vulnerable marine ecosystems (VMEs) component of the work required to fully address Commission Request #6b. Updated kernel density estimation analyses (KDE) and new species distribution models (SDMs) were completed and the KDE polygons for each of the VMEs were reviewed and where necessary modified in light of the predicted distributions. Full details are provided in four SCRs (SCR Docs. 25/036REV, 25/047REV; SCR Docs. 25/035REV, 24/063) and summarized in the report of the 2025 WG-ESA meeting (SCS Doc. 25/16)Here, the conclusions of that work are further summarized to highlight the areas of significant concentration that will be used to assess the impact of bottom fisheries on VMEs.

KDE is an established method to determine spatial hotspots (i.e. areas of relatively high biomass/abundance) and was used by NAFO in the past to identify significant biomass concentrations of VME indicator taxa (SCS Doc. 13/024; SCS Doc. 19/25). It only considers the spatial distribution of biomass and does not incorporate any environmental data. In support of the NAFO reassessment of Significant Adverse Impacts (SAI) on VMEs, which includes a review of the closed areas to protect VMEs in the NAFO Regulatory Area, KDE of Large-sized Sponges, Sea Pens, Small and Large Gorgonian Corals, Erect Bryozoans, Sea Squirts (*Boltenia ovifera*), and Black Corals were undertaken using all available research vessel (RV) survey biomass data (1995–2024) (SCR Doc. 25/036REV).

For the first time, subgroups of some of the VME functional groups had sufficient data to warrant application of the KDE analyses. These included two families and one suborder of sponges (Tetillidae, Polymastiidae, Astrophorina), four sea pen genera (*Balticina*, *Funiculina*, *Pennatula*, and *Anthoptilum*) and two species of small gorgonian coral (*Acanella arbuscula* and *Radicipes gracilis*). These analyses allowed for a visual and quantitative comparison with their corresponding functional group VMEs to determine if there is adequate protection for these taxa when the functional group alone is considered. For the majority of the subgroups, there is a large proportion of their VME area that lies outside of their respective VME functional group and therefore should be taken into account when evaluating closed areas and significant adverse impacts on VMEs in the NAFO Regulatory Area.

The results of the KDE analyses are detailed in SCR Doc. 25/036REV) with supporting text, tables and figures leading to the selection of the RV catch threshold to define the VMEs. For Tube-dwelling (Cerianthid) Anemones and Sea Lilies (Crinoids), updated distribution maps were provided, drawing on data from RV trawl surveys, NEREIDA rock dredge samples and NEREIDA underwater imagery.

Species distribution modeling (SDM) predicts the presence/absence or abundance/biomass of a species or habitat (the response variable) from environmental variables thought to influence it (the predictor variables). Predicted distributions, built using Random Forest classification trees, have been estimated for Large-Sized Sponges, Sea Pens, Black Corals, Large Gorgonian Corals, Small Gorgonian Corals, Erect Bryozoans, and Sea Squirts (mostly a single species, *Boltenia ovifera*) VME functional groups, as well as for the subgroups (SCR Docs. 25/035REV, 24/063). Additionally, predictive models of sponge grounds and bryozoan habitats were generated using data from catches above the weight threshold from the KDE used to identify the VME, in order to better understand the conditions supporting the significant concentrations. The additional models of VME functional group subtaxa were used to compare the results of the predicted distributions of individual taxa versus that of their functional group. For the first time these SDMs were performed using a common set of environmental predictors.

Full details of the biological and environmental data, model fitting, variable importance and evaluation of model performance are presented in SCR Docs. 25/035REV, 24/063, and data have been uploaded to the NAFO Sharepoint. All models generally scored high accuracy across the validation statistics, giving confidence to their prediction surfaces. The uncertainty in the prediction surfaces, and the areas of model extrapolation (where the model predicts habitat suitability outside the range of environmental conditions used to train the model) were identified and considered in the VME delineation process, as they correspond to areas where predictions are less reliable.

The correspondence between the KDE-generated VME polygons and areas of predicted occurrence derived from SDMs was examined and used to modify the polygons (SCR Doc. 25/035REV) to eliminate areas where the taxon was *not predicted to occur with high probability* (as was done previously; SCS Doc. 13/024; SCS Doc. 19/25). Of the 16 VME Indicator taxa, 10 had modifications to one or more of their polygons (SCR 25/035REV, SCS Doc. 25/16). No modifications were made to the Sea Pen functional group, the sea pen subgroups *Balticina* and *Funiculina*, the Black Corals functional group, the Large Gorgonian Corals functional group and the small gorgonian coral *Acanella arbuscula*.

The updated VME delineations (Fig. vi.1) were highly consistent with prior analyses (SCR Doc. 19/058, NAFO SCS Doc. 20/14). This indicates that the general areas where VMEs are located are increasingly well defined, where additional data contributes to refining the boundaries for the better known taxa and incrementally improves the delineations for the taxa with less information.

In general, there was an increase in area for all VME functional group indicators over the area estimated in 2019 (Table vi.1), with the Large Gorgonian Corals and Black Corals showing the least change. This is despite high similarity in the density threshold selected to delineate the VME polygons. For the Small Gorgonian Corals, the selection of the lower weight threshold (0.065 kg/RV tow) contributed to the large increase in area for that VME indicator. This produced Small Gorgonian Corals KDE VME polygons on the Flemish Cap (Fig. vi.2A), which

in some cases overlap with the existing closures, increasing their conservation value. Spatially, there was high congruence between the analyses performed in 2019 (SCR Doc. 19/058) and the present analyses, which further improved after the modifications were mapped (Fig. vi.2).

Table vi.1. Values of the significant concentration threshold (kg) from research vessel catches and total area (km^2) of VME polygons for the years 2013, 2019 and 2025. Area of VME for 2025 is given for the final modified KDE VME.

VME Indicator	Research Vessel Catch Threshold (kg) for Identifying VME Polygons			Area of VME (km^2)		
	2025	2019	2013	2025	2019	2013
Large-Sized Sponges	100	100	75	28317	24218	19824
Sea Pens	1.5	1.3	1.4	9441	8498	6983
Small Gorgonian Corals	0.065	0.2	0.15*	13050	4540	307
Large Gorgonian Corals	0.7	0.6	0.6	5339	5007	3506
Sea Squirts	0.25	0.35	0.3	5212	4077	2193
Erect Bryozoans	0.2	0.2	0.2	5541	3491	6587
Black Corals**	0.4	0.4	-	2894	2631	-

*In 2013 KDE analyses were performed for Divisions 3NO and in 2019 and 2025 the Divisions 3LMNO were combined.
** KDE analyses on Black Corals catches were performed for the first time in 2019.

The VME areas inside area closures ('Closed Area Protected') according to the NAFO Conservation and Enforcement Measures (SCS Doc. 25/16), inside the fishing footprint but outside a VME closure ('Unprotected'), and outside the fishing footprint and closed areas ('Conditionally Protected') are shown in Table vi.2 for each of the VME taxa for which KDE analyses were generated (see SCR Doc. 19/058 for illustrations and comparative tables with the 2013 and 2019 results for common taxa). As in 2019, protection for the Erect Bryozoans and the Sea Squirts (*Boltenia*) is almost non-existent. Almost all (≥ 99%) of their VME areas fall in Unprotected area which means that they are extremely vulnerable to significant adverse impacts of fishing. A similar situation occurs for Small Gorgonian Corals, which have 82% of their area unprotected. The greatest protection overall is afforded to the Large-Sized Sponges and Large Gorgonian Corals (Table vi.2).

For the new data on the subgroups (Table vi.3), it is clear that taxon-specific protections should be examined for the Polymastiidae sponges and all subgroups of sea pens, but for *Funiculina* and *Pennatula* in particular. The spatial overlap between the subtaxa and their corresponding functional group is provided in SCR Doc. 25/047REV.

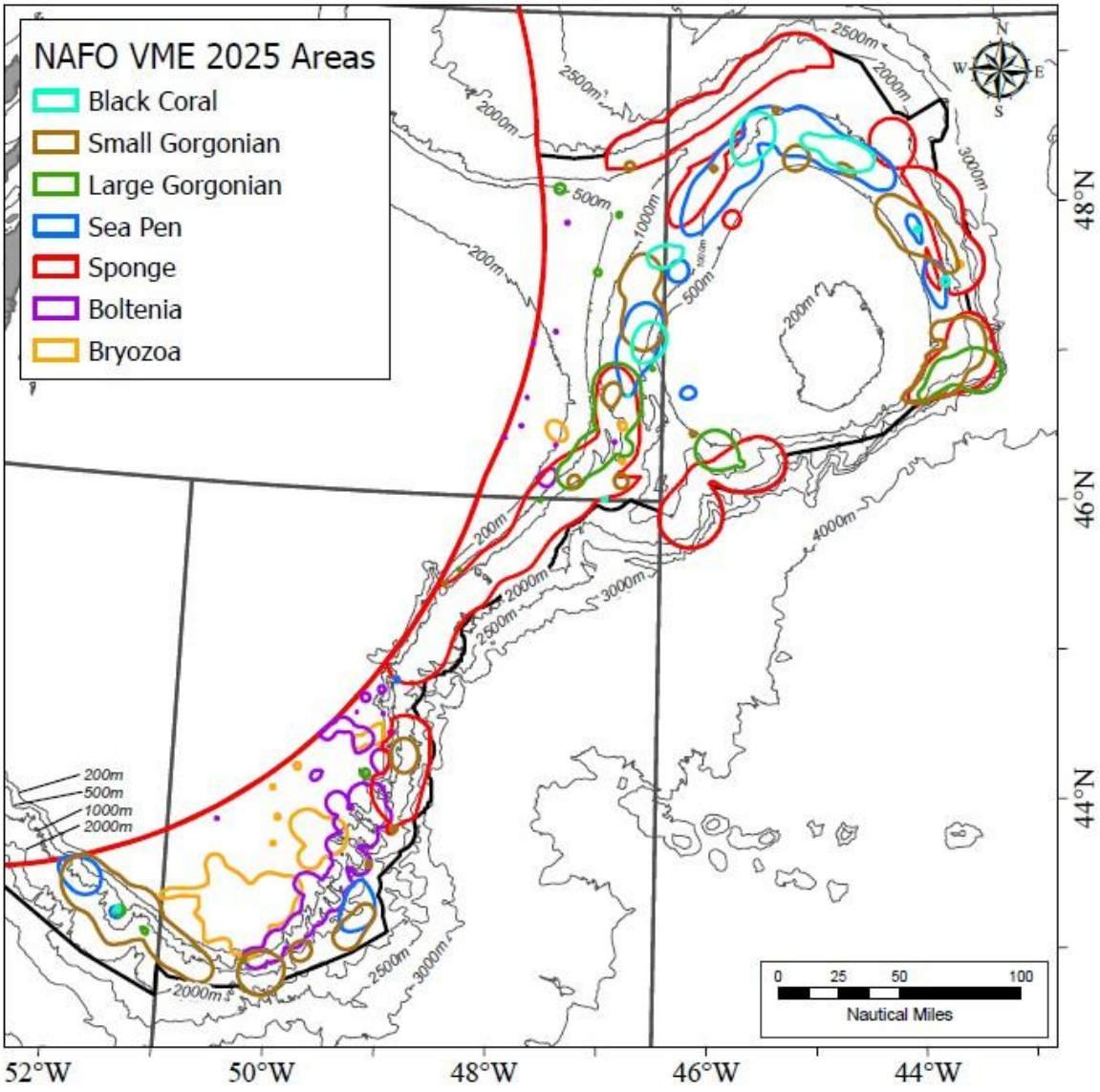


Figure vi.1. Overview map of the locations of the final modified 2025 KDE VME taxa polygons (Large-Sized Sponges, Sea Pens, Small Gorgonian Corals, Large Gorgonian Corals, Erect Bryozoans, Sea Squirts (*Boltenia ovifera*), and Black Corals) in the NAFO Regulatory Area colour coded by taxon. Black line is the fishing footprint and the red solid line is the Canadian Exclusive Economic Zone.

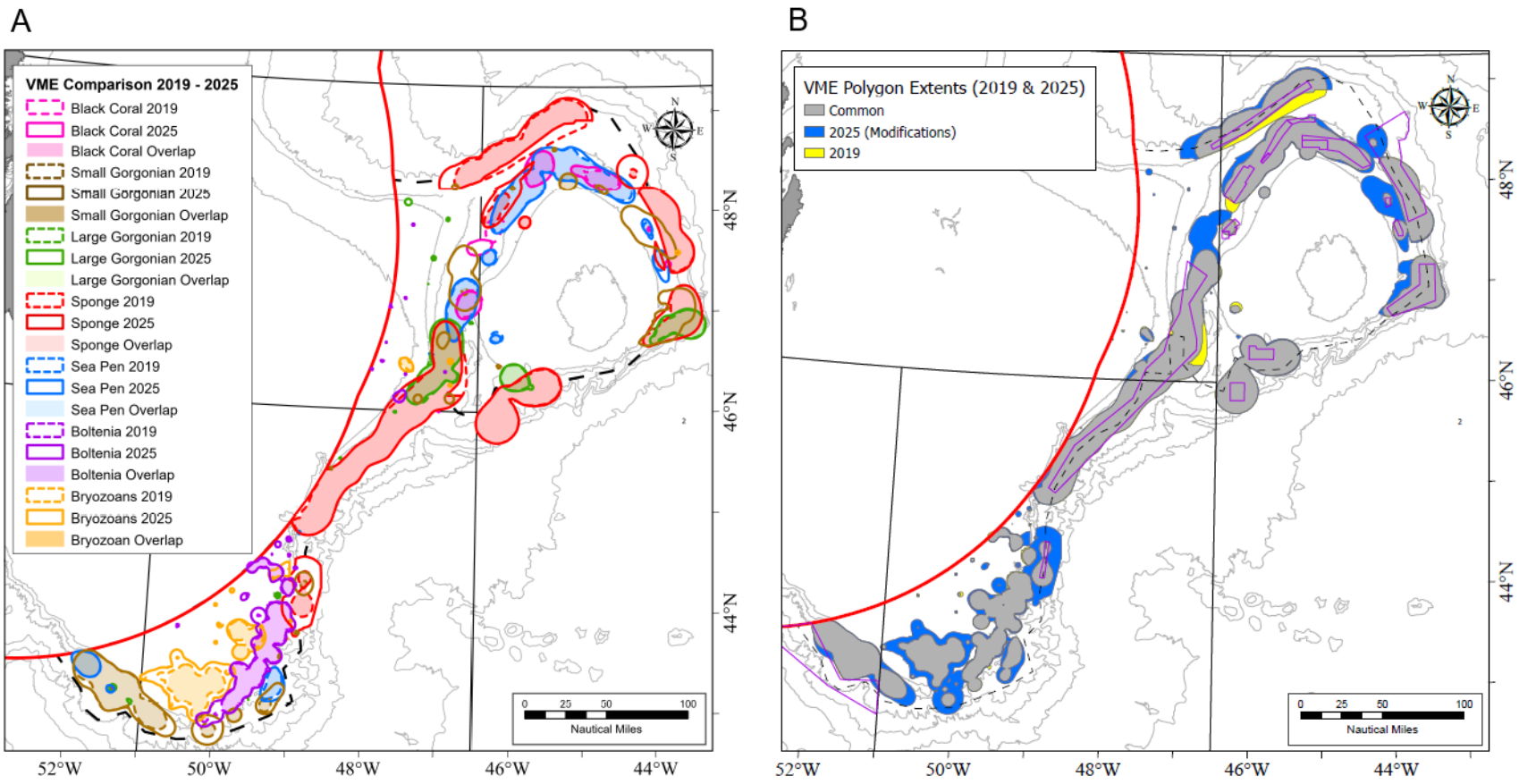


Figure vi.2. Overview map of the location of the KDE VME taxa polygons (Large-Sized Sponges, Sea Pens, Small Gorgonian Corals, Large Gorgonian Corals, Erect Bryozoans, Sea Squirts (*Boltenia ovifera*), and Black Corals) in the NAFO Regulatory Area. **A)** Colour coded by taxon. For all taxa the polygons determined and accepted from the 2019 analysis are shown in dashed line and compared with those from the 2025 analyses in solid lines. Areas of overlap between the polygons produced in each year are shaded. Dashed black line is the fishing footprint and the red solid line is the Canadian Exclusive Economic Zone. **B)** Areas of overlap between the polygons produced in each year (2019 and 2025) are shaded grey; new VME area identified in 2025 is shaded blue; former VME area identified in 2019 but no longer considered is shaded yellow.

Table vi.2. Total areas (km²) of VME polygons generated in 2025 that are Closed Area Protected, Conditionally Protected, and Unprotected in NAFO Divisions 3LMNO. The percentage of total area of each treatment is also shown. Areas represent the KDE VME polygons after the modifications were made.

VME Indicator	Total Area of 2025 VME (km²) after Modifications	Closed Area Protected		Conditionally Protected		Total Protected (Closed Area + Conditionally Protected)		Unprotected	
		Area (km²)	Percent Total (%)	Area (km²)	Percent Total (%)	Area (km²)	Percent Total (%)	Area (km²)	Percent Total (%)
Large-Sized Sponges	28317	10620	38	7618	27	18238	64	10079	36
Tetillidae	24071	7220	30	4137	17	11357	47	12713	53
Polymastiidae	11462	2875	25	17	0	2892	25	8570	75
Astrophorina	26704	8807	33	3932	15	12739	48	13965	52
Sea Pens	9441	2824	30	4	0	2828	30	6614	70
Anthoptilum	9012	2341	26	0	0	2341	26	6671	74
Balticina	23141	3903	17	243	1	4146	18	18993	82
Funiculina	2466	306	12	0	0	306	12	2160	88
Pennatula	9619	1372	14	298	3	1670	17	7949	83
Black Corals	2894	1124	39	5	0	1129	39	1764	61
Large Gorgonian Corals	5339	3118	58	336	6	3454	65	1885	35
Small Gorgonian Corals	13050	2106	16	308	2	2414	18	10636	82
Acanella arbuscula	4144	133	3	0	0	133	3	4011	97
Radicipes gracilis	6466	1030	16	0	0	1030	16	5436	84
Erect Bryozoans	5541	31	1	7	0	38	1	5502	99
Sea Squirts	5212	2	0	0	0	2	0	5210	100

Table vi.3. The unmodified KDE VME areas (SCR Doc. 25/036REV) for each of the Large-Sized Sponges, Sea Pen and Small Gorgonian Corals subgroups which overlap with that of their respective functional group taxon are indicated (Common Area). The percentage of the common area of the subgroup area (VME Taxon Area) is also indicated as well as the percentage of the subgroup area lying outside the functional group.

VME Group	VME Group Area (km^2)	VME Taxon	VME Taxon Area (km^2)	Common Area (km^2)	Percent Common Area of VME Taxon Area (%)	VME Taxon Area Outside VME Group Area (km^2)	Percent VME Taxon Area Outside VME Group Area (%)	Number of VME Taxon Polygons Outside of VME Group Area
Large-Sized Sponges	33144.2	Tetillidae	30029.3	16322.8	54.4	13706.5	45.6	5
		Polymastiidae	11851.7	4608.5	38.9	7243.2	61.1	17
		Astrophorina	29197.3	20414.2	69.9	8783.1	30.1	4
Sea Pens	9441.1	Anthoptilum	9305.7	7309.9	78.6	1995.8	21.4	2
		Balticina	23141.3	8945.4	38.7	14195.9	61.3	5
		Funiculina	2465.6	505.6	20.5	1960.0	79.5	1
		Pennatula	10252.2	2899.4	28.3	7352.8	71.7	10
Small Gorgonian Corals	13379.7	Acanella arbuscula	4143.6	4130.7	99.7	13.0	0.3	0
		Radicipes gracilis	7078.7	1682.0	23.8	5396.7	76.2	2

Workplan for the assessment of SAI and management options

SC agreed on a workplan for the assessment of SAI and management options in fulfilment of the reassessment of NAFO bottom fisheries required in 2027. The critical tasks of the workplan, which must be completed ahead of the assessment of SAI and determination of the management options, are: (i) a finalised set of VME polygons, including VME functional types and new specific VME functional sub-types (this task is now completed), (ii) the creation of new VME biomass grid using a revised methodology, (iii) an updated VMS fisheries effort data layer, and (iv) the integration of the VMS and log-book data. The planned update of some of the secondary SAI assessment metrics, that had been considered at WG-ESA, are no longer feasible for the 2027 assessment due to changes in available resources. The metrics in question may include: (i) the fishing (VMS) stability index, (ii) overlapping VME polygons, (iii) overlapping functional polygons, (iv) VME fragmentation index, and (v) VME closure adequacy 'consistency' index. However, the primary assessment indicators of SAI (proportion of VME protected, VME at risk, and VME impacted) will be updated using the new VME biomass grid, VME polygons and fishing effort data layers. The 2021 assessment showed that considering secondary SAI metrics did not change the overall outcome of the assessment from when it was conducted solely on the basis of primary SAI metrics, but secondary metrics were useful to further consolidate the assessment results. For the determination of the management options, the scientific trade-off approach applied in the 2020 assessment (reported in 2021) will be the basis for the 2027 assessment. However, additional consultation with managers in developing the management options is planned for the 2027 assessment (Table vi.4). The core data layers required will be compiled as part of the SAI assessment and will include: (i) VMS fishery data (2011 – 2024 effort as tracks in km. km^{-2}. yr^{-1}), (ii) integrated VMS and log-book data for catch and landings (2016 – 2024), (iii) updated VME biomass grid (km^2), and (iv) updated VME polygons. When evaluating the management options, SC also considered it important to include if possible: (i) information on the proposed area climate sensitivity, refugia status and connectivity, (ii) relevant information on the long-term fishing patterns in the NRA, e.g. the historic fishing patterns described in Kulka and Pitcher (2001), and (iii) comparable information on the Canadian snow crab fishery (e.g. VMS, catch and landings data), which is especially relevant for the Bryozoan and *Boltenia* sp. VMEs on top of the tail of the Grand Bank. Any other information related to fishing activities that CPs may deem important for SC to include as part to this process could be brought forward at the 2026 WG-EAFFM meeting for consideration and discussion on feasibility.

The process and sequence of analysis to be undertaken as part of the SAI, along with the sequence of specific tasks to be undertaken for the management options, is especially important, and is summarised as follows:

1. In the first instance the reassessment of SAI and the management options will focus on the 7 defined and currently mapped VME functional types (VME polygons), as was the case in the 2nd reassessment: (i) sea pen, (ii) black corals, (iii) small gorgonian, (iv) large gorgonian, (v) large sponge, (vi) bryozoan, and (vii) sea squirts (*Boltenia* sp.).
2. VME polygons for these functional types, which identify significant VME biomass located outside current closures and at risk of SAI, will be delineated and any associated commercial fishing effort and catch levels will be determined.
3. The VME at risk and potentially subject to fishing activity (from Step 2) will be assessed to determine possible management options (either as new VME fishery closures and/or adjustments to the boundaries of existing VME fishery closures). This analysis will also include snow crab fishery data, where available. Central to this and all additional steps in designing management options is achieving the best possible balance between the objectives of reaching a low/acceptable risk of SAI whilst minimizing impacts on fishing activities.
4. The potential management options determined by Step 3 will be further assessed to accommodate any newly identified VME subgroup polygons where appropriate (e.g. new genera of sea pens, sponges, gorgonians).
5. The potential management options determined by Step 4 will be further assessed with respect to (i) climate sensitivity, (ii) connectivity, and (iii) historic fishing patterns.

Timeline of the management option evaluation process is provided in Table vi.4.

Table vi.4. Timeline of key processes/ events to deliver finalised set of management options as part of the next reassessment of bottom fisheries. The steps in this table are conditional on the previous steps. Note: the current planning and delivery are highly dependent on the location and format of the 2026 WG-ESA meeting.

Stage / Timing	Process / Event	Key Outputs / Results	Purpose / Outcome
By March 2027 (latest)	Intersessional online meeting of WG-ESA	Maps and tables summarising results of all analytical steps, including draft management options	Present and review scientific outputs and supporting evidence for improving VME closures design to minimize the risk of SAI
March/ April 2027	Participation of managers in WG-ESA/ WG-EAFFM intersessional meeting	Direct engagement and communication of scientific rationale and methodology, including early sharing of draft management options	Early involvement of managers to inform and gather initial feedback on draft management options ahead of the SC meeting where the management options will be formalized
June 2027 (SC)	Scientific Council	Proposed management options (e.g. new VME closures and/or boundary adjustments)	Scientific review of the SAI-VME assessment and management options, and development of the formal SC advice to COM on these matters
July 2027 (WG-EAFFM)	Review by WG-EAFFM	Further evaluation and potential refinement of proposed management options	Potential agreement on a finalised set of management options to be recommended to COM for adoption
If required (2027)	Additional intersessional WG-EAFFM	Further discussion of management options	Resolve outstanding issues (if needed)
September 2027 Annual Meeting	Submission to Commission	Final agreed management options	Consideration for adoption and implementation

The current planning and delivery are highly dependent on the location and format of the 2026 WG-ESA meeting.

References

Kenchington, E., Lirette, C., Murillo, F.J., Hayes, V., Sacau, M., and Gonçalves, P., 2025a. Identification of Vulnerable Marine Ecosystems in the NAFO Regulatory Area Combining Kernel Density Analyses, Species Distribution Modeling and Empirical Data. NAFO SCR Doc. 25/036REV.

Kenchington, E., Lirette, C., Sacau, M., Murillo, F.J., and Wang, Z., 2025b.. Vulnerable Marine Ecosystems in the NAFO Regulatory Area: Updated Kernel Density Analyses of Vulnerable Marine Ecosystem Indicators. NAFO SCR Doc. 25/047REV

Kenchington, E., Lirette, C, Murillo, F.J., Beazley, L, and Downie, A. L., 2019. Vulnerable Marine Ecosystems in the NAFO Regulatory Area: Updated Kernel Density Analyses of Vulnerable Marine Ecosystem Indicators. NAFO SCR Doc. 19/058.

Kulka, D. W., and Pitcher, D. A., 2001. Spatial and Temporal Patterns in Trawling Activity in the Canadian Atlantic and Pacific. ICES CM Document, ICES CM 2001/R:02: 55.

Murillo, F.J., Abalo Morla, S., Downie, A.-L., Lirette, C., Paulin, N., Wang, Z., Devred, E., Clay, S., Sacau, M., Nozères, C., Koen-Alonso, M., Gullage, L., Caetano, M., Gonçalves, P., and Kenchington, E., 2025. Vulnerable Marine Ecosystems in the NAFO Regulatory Area: Updated Species Distribution Models

of Selected Vulnerable Marine Ecosystem Indicators (Large and Small Gorgonian Corals, Erect Bryozoans and Sea Squirts). NAFO SCR Doc. 25/035REV.

Murillo, F.J., Downie, A.-L., Abalo Morla, S., Lirette, C., Paulin, N., Wang, Z., Devred, E., Clay, S., Sacau, M., Nozères, C., Koen-Alonso, M., Gullage, L., and Kenchington, E., 2024. Vulnerable Marine Ecosystems in the NAFO Regulatory Area: Updated Species Distribution Models of Selected Vulnerable Marine Ecosystem Indicators (Large-Sized Sponges, Sea Pens and Black Corals). NAFO SCR Doc. 24/063.

NAFO, 2025. Report of the Scientific Council Working Group on Ecosystem Science and Assessment, 4 - 12 November 2025, Madrid, Spain. NAFO SCS Doc. 25/16.

NAFO, 2020. Report of the Scientific Council, 28 May -12 June 2020. NAFO SCS Doc. 20/14 (Rev.).

NAFO, 2019. Report of the 12th Meeting of the NAFO SC Working Group on Ecosystem Science and Assessment (WG-ESA) – November 2019. NAFO SCS Doc. 19/25.

NAFO, 2013. Report of the 6th Meeting of the NAFO Scientific Council Working Group on Ecosystem Science and Assessment (WG-ESA) [Formerly SC WGEAFM]. NAFO SCS Doc. 13/024.

vii) Develop materials on the potential of submitting NAFO coral bottom fishing closed areas as OECMs for discussion at the 2026 WG-EAFFM meeting (request #6c).

Scientific Council responded:

Scientific Council has drafted an OECM submission for coral VME from which a working paper has been compiled by the NAFO secretariat. Scientific Council notes that the fishery closure Area 10 (which supports large sponge VME in addition to sea pen VME) is currently included in the proposed coral OECM. However, Area 10 was excluded from the sponge OECM submission owing to its overlap with oil and gas exploration activities.

At WG-EAFFM in 2024 it was agreed that a draft submission for a coral OECM should be developed, to complement the existing OECM submissions for large sponge VME and seamount fishery closures.

SC has drafted an OECM submission for corals which presents relevant material for all existing coral VME fishery closures for sea pen, gorgonian and black corals VMEs. Specifically, VME fishery closures 7, 7a, 8, 9, 10, 11, 11a, 12, 13, 14a and 14b, are included in the coral OECM as shown in Figs. vii.1 and vii.2. In consultation with the NAFO Secretariat, a working paper has been drafted for consideration by WG-EAFFM in 2026.

SC notes that the VME fishery closure Area 10 (which supports both large sponge VME and sea pen VME) is currently included in the proposed coral OECM. However, Area 10 was excluded from the sponge OECM submission owing to its overlap with oil and gas exploration activities.

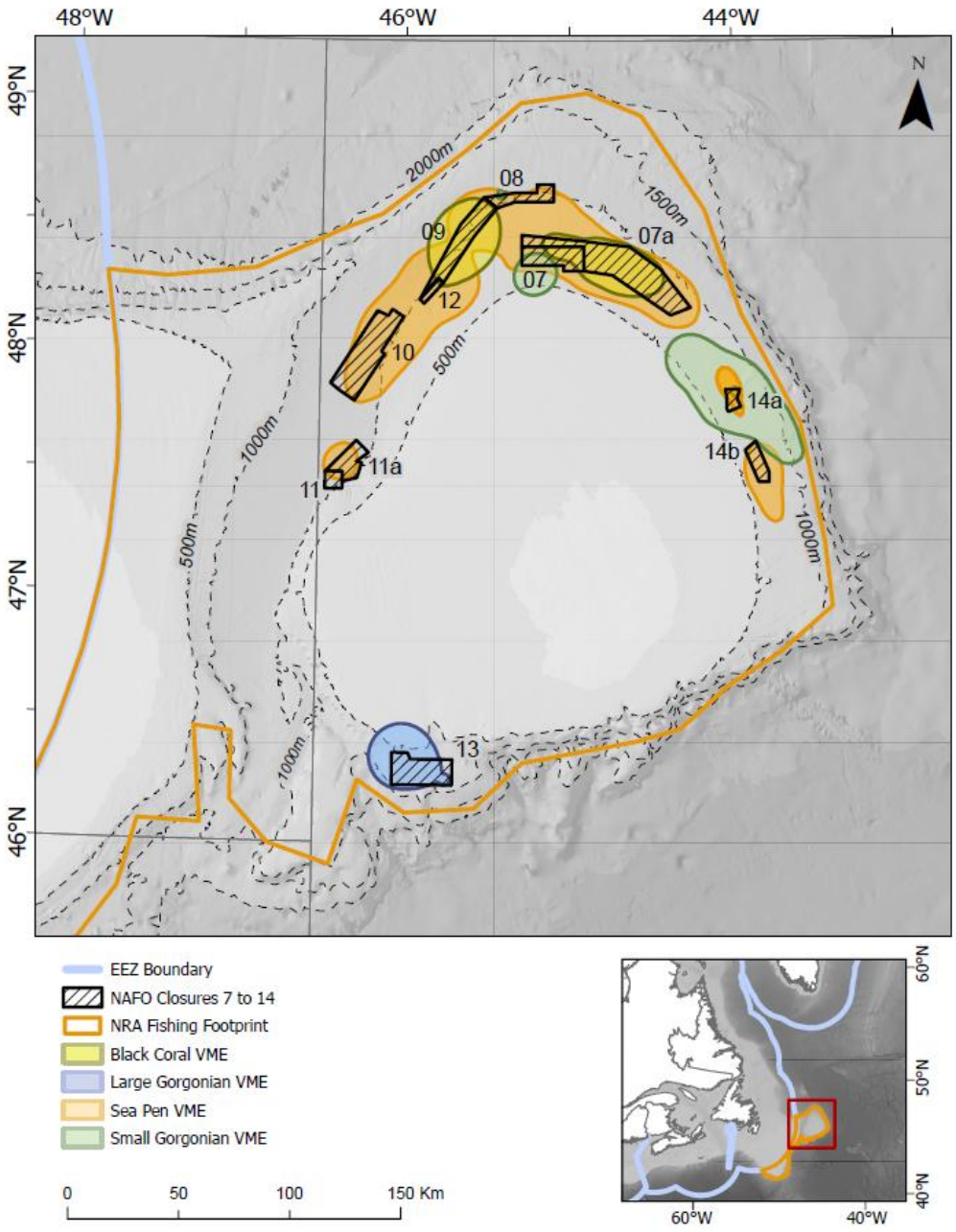


Figure vii.1. Fishery closures which protect sea pen, large and small gorgonian and black corals VMEs. Note, not all of the VME polygons and VME fishery closures are shown on this map – e.g. it excludes large sponge VME and fishery closures which were included in the sponge OECM and which protect large gorgonian coral VME in Flemish Pass (Area 2) and on the southeast slope of Flemish Cap (Area 4). The VME polygons that are in this figure correspond to the 2025 VME reassessment and represent only those polygons that are overlapping with the closures.

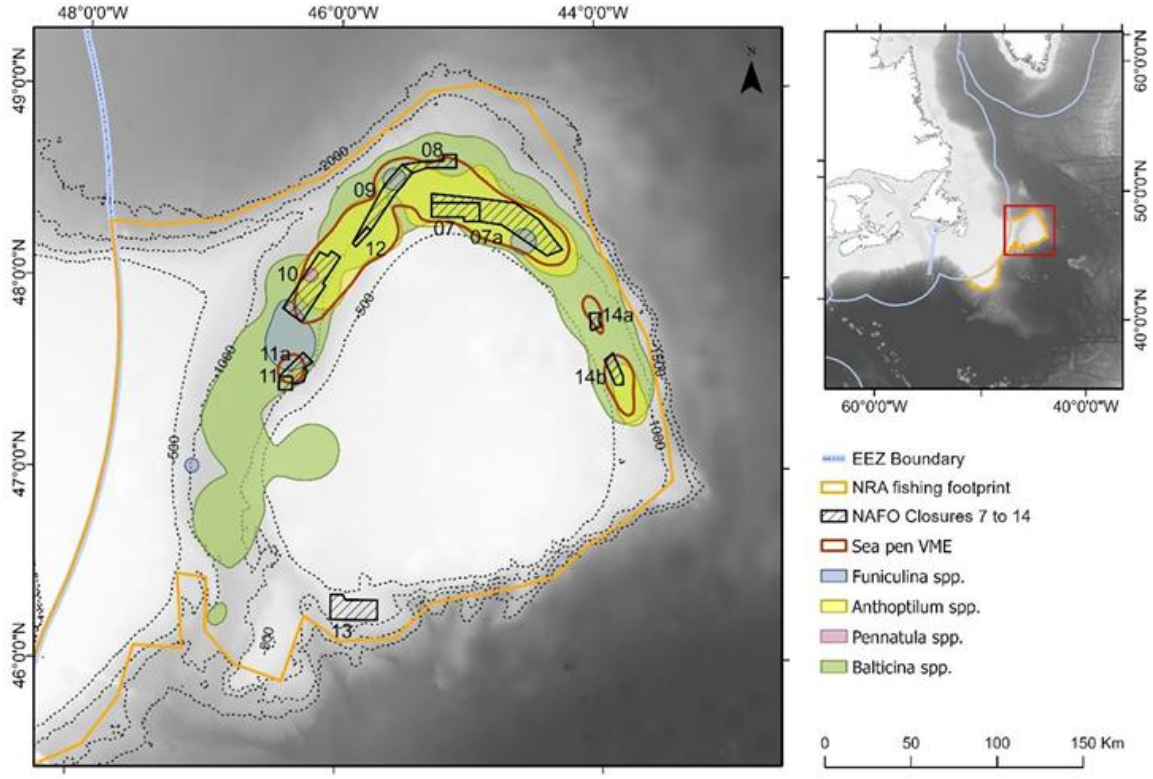


Figure vii.2. The fishery closures which protect subgroups of sea pen VME indicator taxa in the NRA (sea pen genera Funiculina, Anthoptilum, Pennatula and Balticina VMEs) that are considered for inclusion in the coral OECM submission. Also, the extent of the corresponding sea pen functional VME polygon is shown. Note, not all of the VME fishery closures and VME polygons are shown on this map – e.g. it excludes large sponge, gorgonian and black coral VME polygons, it also excludes VME fishery closures for sponge in Flemish Pass (Area 2) and on the southeast slope of Flemish Cap (Area 4) which overlap with large gorgonian VME.

viii) Develop reference points to facilitate the implementation of the Revised NAFO Precautionary Approach Framework, for stocks that currently do not have them (request #7).

Scientific Council responded:

Due to the lack of Chair, the PA-WG could not meet in 2026. The work required to derive Reference Points (RPs) for stocks with a full assessment in 2026, for which reference points have not yet been developed for application in the PAF, could not be done prior to the June 2026 Scientific Council meeting. Work was conducted during this meeting, but the PA RPs for only two stocks with full assessment in 2026 (3NO witch flounder and Greenland halibut Sub. 1A inshore Uummannaq) were developed, and another one was deferred to September (3M redfish).

The PA RPs for the 3M shrimp and the F_{msy} for Northern shrimp in Subarea 0 and Subarea 1 will be developed during the September 2026 Scientific Council Shrimp Assessment Meeting.

During the WG-PA in December 2024 meeting, it was agreed that the Designated Experts (DEs) for the stocks that are scheduled to undergo a full assessment in a given year would work towards the development of Reference Points (RPs) that can be used in the revised Precautionary Approach Framework (PAF) that year. DEs should try to use different methods to estimate their RPs, based on the approaches proposed by Scientific Council (SCS Doc. 23/07).

Due to the lack of Chair, the PA-WG could not meet in 2026. The work required to derive RPs for stocks with a full assessment in 2026, for which reference points have not yet been developed for application in the PAF, could not be done prior to the June 2026 SC meeting. During the WG-RBMS meeting of April 2026, it was decided that the work will be undertaken during the 2026 June Scientific Council meeting where possible.

Progress to date for the stocks with a full assessment in June 2026 is as follows:

- The full set of PA RPs were not developed for: Greenland halibut Sub. 1A inshore for Disko Bay and Upernavik, demersal redfish and deep-sea redfish in SA 1, wolffish in SA 1 (Atlantic and spotted), American plaice in Div. 3M and redfish in Divs. 3LN.
- The scheduled/requested full assessments for 3LNO American plaice and 3LNOPs thorny skate were not conducted and so PA RPs were not developed.
- PA RPs were developed for Greenland halibut Sub. 1A inshore Uummannaq and witch flounder in Divs. 3NO.
- Cod in Div. 3M: PA RPs were developed in 2025. No change this year.
- Redfish in Div. 3M: Deferred to September 2026.

PA RPs for 3M shrimp and the F_{msy} for the Northern shrimp in Subarea 0 and Subarea 1 will be calculated during the September 2026 Scientific Council Shrimp Assessment Meeting.

It is possible that in the coming years, as the PAF is applied to more stocks, further refinement of the PA Framework may be necessary.

References

NAFO, 2023. Report of the NAFO Precautionary Approach Working Group (PA-WG), 28 February 2023, by Webex. NAFO SCS Document 23/07.

ix) Continue to update the 3-5 year work plan, which reflects requests arising from the 2025 Annual Meeting, other multi-year stock assessments and other scientific inquiries already planned for the near future (request #8).

Scientific Council responded:

Scientific Council updated the 2026-2027 annual plan and identified priorities and provided some early estimates of resource requirements and gaps.

Scientific Council work continues to fall to a small number of scientists who are over-burdened with requests.

Scientific Council work in 2025-2026 included, but was not limited to, single species stock assessments including the implementation of the revised PA framework, calculation of the Subarea 2 + 3KLMNO Greenland halibut management procedure TAC and testing of exceptional circumstances, advances in 3LN redfish MSE models, identification of priority stocks requiring benchmark assessments, planning for SAI-VME and development of management options, reassessment of VME areas, completion of the Roadmap summary, and the climate change scoping request.

Noting the fullness of the agenda within the June SC meeting, Scientific Council **recommends** *a subgroup be formed to explore efficiencies in the drafting, editing and reviewing of reports within SC.*

Scientific Council continues to be concerned about all vacancies within Scientific Council. If these positions are not filled in September 2026 there is a risk that work may not be complete. For example, if a Designated Expert for SA 3 + 4 squid is not nominated prior to the September meeting, the interim monitoring for squid cannot be completed

SC updated the 2026-2027 annual workplan.

This workplan is evergreen and is updated and reviewed each June and September to include all Commission and coastal States requests as well as SC work carried out of its own accord. The most recent workplan is available on the Commission SharePoint (annual meeting /relevant documents).

The work plan was first requested by the Commission in 2018 in response to Scientific Council concerns over increased workload. SC identified an increase in requests as well as an increased number of SC and WG

meetings in recent years in parallel to a decrease in SC members actively participating at the June meetings. It has remained difficult to fully address all requests over the year.

SC has reported a preliminary estimation of the resources required for that plan. Such estimation will serve as basis for monitoring of the resources required to carry out the workplan. The resources required and resource gaps will be estimated with more precision over time.

SC has also outlined current priorities.

SC reiterates that the work plan should facilitate a more concrete discussion of trade-offs between effort dedicated to scientific activities, including addressing new versus the current/strategic requests. This rarely happens because the work falls to a small number of scientists who are over-burdened with recurring requests, often pressured to deliver, and therefore are incapable of delivering on new, strategic requests. This is in addition to other daily work they do unconnected to NAFO.

SC notes the previous challenges with coordinating the workplan and the Commission requests. The Commission has proposed a new process to be implemented in 2026 (COM 25-15) and the effectiveness of this initial implementation will be evaluated by SC over the coming year.

SC emphasized the importance of stability in the work plan, i.e. that new requests should be clearly justified as they will have impact on delivering existing work plan items.

The 2025-2026 workload in preparation for the June 2026 meeting included:

- thirteen full stock assessments, of which ten were completed (Div. 1A inshore Disko Bay Greenland halibut, Div. 1A inshore Uummannaq Greenland halibut, Div. 1A inshore Upernavik Greenland halibut, SA 1 demersal and deep sea redfish, SA 1 Atlantic wolffish, SA 1 spotted wolffish, Div. 3M cod, Div. 3M American plaice, Divs. 3LN redfish, Divs. 3NO witch flounder) and one was deferred to September 2026 (3M redfish). The remaining two full assessments could not be undertaken: 3LNO American plaice due to workload constraints and 3LNOPs thorny skate due to the absence of a Designated Expert,
- implementation of the revised PA framework (requiring the development of new reference points and of new ways to develop and communicate advice),
- monitoring of ecosystems via interim monitoring of ESS,
- assessment of ecosystem sustainability of catches (2TCI analysis),
- calculation of the Subarea 2 + 3KLMNO Greenland halibut management procedure (MP) TAC and testing of exceptional circumstances,
- 11 Interim Monitoring Reports,
- advances in 3LN redfish MSE operating models,
- identification of priority stocks requiring benchmark assessments,
- review of the northern shrimp South Stock Assessment Region MSE operating models,
- completion of the Arc GIS data repository,
- reassessment of Vulnerable Marine Ecosystem (VME areas),
- planning for SAI-VME and development of management options,
- completion of the Roadmap summary document, and
- the climate change scoping impact request.

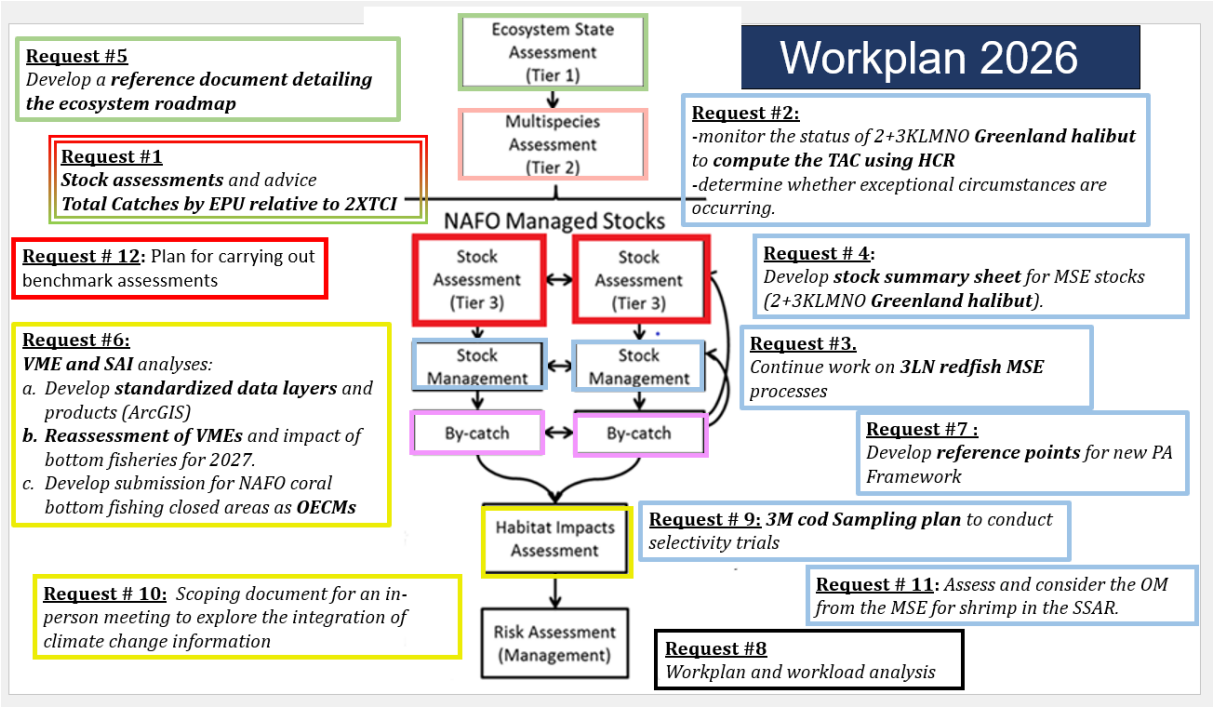
Noting the fullness of the agenda within the June SC meeting, SC **recommends** *a subgroup be formed to explore efficiencies in the drafting, editing and reviewing of reports within SC.*

SC continues to be concerned about all vacancies within SC. If these positions are not filled in September 2026 there is a risk that work may not be complete. For example, if a DE for SA 3 + 4 squid is not nominated prior to the September meeting, the interim monitoring for squid cannot be completed.

For 2026-2027, key SC activities are expected to include three full stock assessments in June, three stock assessments in September, initial work on 3LNO American plaice and 3NO cod benchmark assessments, development and review of management options for VME protection, and a mid cycle MSE assessment of Greenland halibut in 2+3KLMNO.

For 2027-2028, key SC activities are expected to include eight stock assessments in June, three stock assessments in September, completion of 3LNO American plaice and 3NO cod benchmark assessments, update of the TCI framework and data update, and the full update of the ecosystem summary sheets.

An update was provided to SC on the Third Performance Review focused on the assessment of the scientific process within NAFO. As for the focus of the Third Performance Review, an early review by SC can contribute significantly to the development of the Terms of Reference (ToRs), for example, providing an opportunity to flag gaps in the draft ToRs for further consideration of the WG prior to presentation to Commission. For that, SC is requesting an opportunity to review the ToRs for the Performance Review before they are presented to the Joint COM/SC session in September 2026.



References

NAFO, 2025. Process – The Commission's Request for Scientific Advice. NAFO COM Doc. 25-15 [Adopted].

x) Explore the development of a sampling plan to conduct selectivity trials in the cod fishery in 3M. The objective is to collect data to test the effectiveness and impact of using sorting grids to improve the selectivity of cod and other species (request #9):

Scientific Council responded:

A sampling plan, designed to be developed in collaboration with industry, was presented and it was revised by Scientific Council. The aim of this sampling plan is to conduct selectivity trials in the cod trawl fishery in 3M with the objective of collecting data to test the effectiveness and impact of using sorting grids when using 130 mm mesh to improve the selectivity of cod and other species. A report in the form of an SCR document with the results of the trials will be presented at the June NAFO Scientific Council meeting that occurs during the subsequent year in which the trials are conducted.

In 2020 the Commission adopted technical measures that were implemented in January 2021, to try to protect the productivity of the Division 3M cod stock. These measures include the closure of the directed fishery for Div. 3M cod during the first quarter of the year, as well as the mandatory use of sorting grids in the trawl fishery when using 130mm mesh. The impact of these measures was analyzed at the 2025 June Scientific Council meeting. The results from this analysis were inconclusive as to whether the use of sorting grids was having a direct effect on selectivity. In 2025, with the objective of collecting data to test the effectiveness and impact of using sorting grids to improve the selectivity of cod and other species, the Commission requested the SC to explore the development of a sampling plan to conduct selectivity trials in the cod fishery in 3M.

A sampling plan was developed and will be implemented in collaboration with industry. This was presented to SC. After some discussion, some of the aspects of the original plan, mainly regarding the depths across which this study will occur, were changed. The plan is as follows:

- **Objectives:** The main objective of the sampling plan is to collect data to study the relative selectivity of the trawl gear type "Pedreira" of 130 mm mesh size with rigid "Sort V" sorting grids used in the cod fishery (the test gear) compared to the trawl gear type "Pedreira" 130 mm mesh size used for all other groundfish fisheries (the control gear). The objective is to study the overall selectivity of the sorting grids and codend together. As specific objectives we have to estimate and compare the selectivity of the two gears for cod and redfish in Div. 3M.
- **Method:** a twin trawl Paired-gear method as depicted in Fig. x.1 is proposed.
- **Survey Area**: Flemish Cap at depths consistent with those fished with the targeted cod trawl fishery.
- **Vessel:** It is proposed to conduct the selectivity trials during a commercial trip on a commercial trawl vessel with the capacity to work with twin trawlers that normally fish cod in NAFO.
- **Survey Time Frame:** 30 hauls, each lasting no more than 4 hours. This sample size was consistent with previous gear trials.
- **Survey Period:** May – June.
- **Research staff:** At least three scientists would be required to carry out sampling and data collection; if possible, four scientists would be preferable.
- **Survey Strata:** Two strata with a boundary at 250 m are proposed.
- **Data collection:** Information on the characteristics of the fishing gear and the vessel will be recorded, as well as information of the details of each haul. The catch in each gear will be length measured species by species when possible, focusing in cod and redfish.
- **Data analysis and reporting of survey results:** The aim is primarily to analyze the selection data collected in the trials using the logit size selection model, however, depending on the compiled data and results, it may be possible to use different models to compare the results. A report in the form of an SCR document will be presented at the June NAFO SC meeting that occurs during the subsequent year in which the trials are conducted.

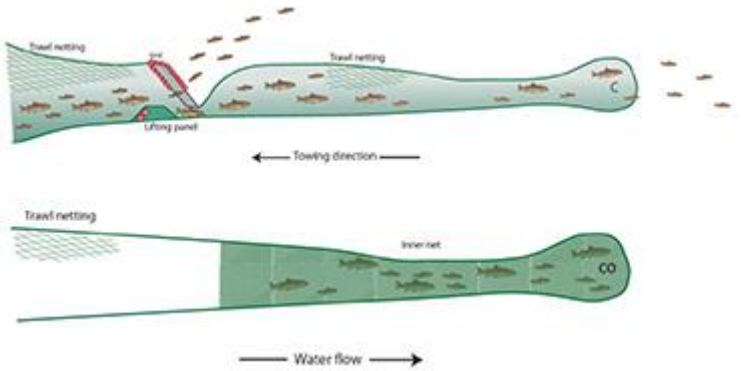


Figure x.1. Illustration of the paired-gear method showing the test (above) and the control (below) gear codend (from Grimaldo *et al.*, 2016)

References

Grimaldo, E., Sistiaga, M., Herrmann, B., & Larsen, R. B., 2016. Trawl Selectivity in the Barents Sea Demersal Fishery. In Fisheries and Aquaculture in the Modern World. InTech. https://doi.org/10.5772/63019.

xi) Draft a scoping document for a potential in-person meeting to explore approaches for further integrating information related to climate change throughout Scientific Council operations (request #10).

Scientific Council responded:

A scoping document was developed, outlining the objectives, structure, and expected outcomes for a potential in-person meeting to explore approaches for further integrating information related to climate change throughout Scientific Council operations. This document will be tabled at the 2026 WG-EAFFM for discussion and presented to COM during the 2026 NAFO Annual meeting.

The NAFO Commission (COM) Resolution 2/23 (COM Doc. 23-13) resolved for NAFO to "consider the current and future impacts of climate change on NAFO managed stocks, non-target species, and associated ecosystems in the Convention Area, including, inter alia, as appropriate, in its decision making, and through its work in the Ecosystem Roadmap".

As requested by the Commission SC developed, in collaboration with the NAFO Secretariat, a scoping document outlining the objectives, structure, and expected outcomes for a proposed in-person meeting. The meeting would focus on establishing a path for the systematic implementation of climate change considerations in the scientific advice, and across the regular operations of SC.

This scoping document will be tabled at the 2026 WG-EAFFM for discussion and presented to COM during the 2026 NAFO Annual meeting.

References

NAFO, 2023. Addressing the Impact of Climate Change on NAFO Fisheries. NAFO COM/Doc. 23-13.

xii) Assess and consider the operational model underlining the MSE developed for the SSAR stock of shrimp by Canada (request #11).

Scientific Council responded:

The operating models for Northern shrimp in the South Stock Assessment Region developed by Canada were considered by Scientific Council to be suitable for application in the NAFO context, and conceptually broadly consistent with other operating models developed by NAFO. As requested by the Commission and based on additional guidance from WG-RBMS, this was not an in-depth review. It was focused on the general adequacy of the operating models in terms of their suitability for application in the NAFO context.

Revised Stock Structure

A revised stock structure for Northern shrimp in the Northwest Atlantic based on distribution, dispersal, and life history information has resulted in a change in the spatial scale of assessment for Northern Shrimp from six assessment areas to two stock assessment regions - North and South. The Southern Stock Assessment Region (SSAR) includes Shrimp Fishing Area (SFA) 6, southern part of SFA 5 and NAFO Divs. 3LNO.

This understanding of stock structure had previously been accepted by SC at the September 2025 NAFO Scientific Council and STACFIS Shrimp Assessment Meeting.

In addition, spatiotemporal models of Northern Shrimp density were developed and applied in Canada to shrimp in the SSAR to calculate annual biomass indices from survey data, which is consistent with a previous request from Scientific Council (SCS Doc. 25/13).

New stock assessment modeling framework (SISCALS)

Canada developed a model to assess Northern shrimp in the SSAR (SISCALS). This model was peer-reviewed and accepted during a Canadian assessment framework review meeting in December 2024.

The SISCALS model is a Bayesian size-structured stock assessment model that estimates Northern shrimp recruitment, biomass, time-varying natural mortality rates, exploitation rates, biological reference points, and status relative to reference points. This model is the basis for the operating models used in an MSE that has been implemented in Canada.

Two operating models were developed based on two future recruitment scenarios: one using recruitment from the time series (1996-2019) and the other from a more recent recruitment period (2010-2019) reflecting lower recent productivity.

A summary of the processes and publications (and pre-publications) associated with the development and use of the operating models was provided including a detailed timeline of the various milestones.

SC response

As requested by the Commission and based on additional guidance from WG-RBMS, this was not an in-depth review. It was focused on the general adequacy of the operating models in terms of their suitability for application in the NAFO context. The operating models were considered by SC to be suitable for application in the NAFO context, and conceptually broadly consistent with other operating models developed by NAFO.

Harvest control rules and performance statistics were not considered by SC as they were not part of the request. SC's understanding is that further discussion on the MSE will take place at the August 2026 WG-RBMS meeting and the September 2026 Commission meeting.

References

NAFO, 2025. Report of the Scientific Council Meeting, 29 May -12 June 2025 Halifax, Nova Scotia. NAFO SCS Document, 25/13: 1-229.

xiii) Consider a plan for carrying out benchmark assessments and include this in the 3-5 year work plan (request #12).

Scientific Council responded:

Scientific Council recommends that a benchmark process be undertaken to develop assessment models for American plaice in Divs. 3LNO and Atlantic cod in Divs. 3NO, with a target completion date of June 2028. In the meantime, these stocks will continue to be monitored with Interim Monitoring Reports.

Scientific Council notes that additional resources will be required to facilitate this work. This should be considered in NAFO budgetary discussions and work planning.

In June 2025 the SC recommended "that a prioritization exercise be undertaken by the end of June 2026 in order to identify 1-2 stocks for benchmark processes over the short term". Discussion of candidate stocks considered data availability (e.g. surveys, ages), ongoing model development, current assessment frameworks and frequency, stock status, and SC and DE capacity.

SC **recommends** that *a benchmark process be undertaken to develop assessment models for American plaice in Divs. 3LNO and Atlantic cod in Divs. 3NO.* These stocks are proposed to undergo this process together in order to capitalize on shared expertise for review, and consideration of shared data sources, common ecosystem considerations, etc.

Both of these stocks are considered to be in the Critical Zone of the NAFO PA Framework and are being monitored by SC using Interim Monitoring Reports. The lack of accepted analytical assessment models limits the ability of SC to advise on population dynamics or to update estimates of stock size relative to accepted reference points. While development of candidate assessment models has been ongoing for both Atlantic cod in 3NO (SCR 22/039, 040) and American plaice in 3LNO (SCR 21/020, 032), further work is needed to advance these, and in the case of American plaice, to address unconverted Canadian survey series. Sufficient review of age-based population models cannot be undertaken within SC without a dedicated process.

The proposed work plan by Scientific Council is as follows:

Expected Delivery	Meeting Type	Proposed Workplan
February 2027	Intersessional (virtual) (3 days)	Formal data review, main model structures to explore.
June 2027	June Meeting (SC)	Update to SC on modelling progress, discussion on continued development. Seek SC endorsement on data inputs and model structures. Interim monitoring for 3NO Atlantic cod and 3LNO American plaice.
Early 2028	Intersessional (hybrid) (4.5 days)	Working meeting to review and refine candidate assessment models. Finalize model selection.
May 2028	Intersessional (virtual 1 day, paired with STACREC)	Report on benchmark conclusions, seek SC endorsement to proceed to assessments.
June 2028	June Meeting (SC)	Full assessments of 3NO Atlantic cod and 3LNO American plaice.

This workplan aims for completion for June 2028, however Scientific Council notes that timelines are notional and subject to revision based on workload, capacity, and challenges with technical aspects of the work. Additional resources will be required to facilitate this work (e.g. DE time, analytical support, intersessional work, in-person model review meetings), and this should be considered in NAFO budgetary discussions and work planning.

Two external reviewers are required to support this process. Contract(s) should be issued for the duration of the benchmark (i.e. from data review to final model selection). The reviewers would be expected to participate in the model review meeting in-person. The contract should specify TORs, scope, deliverables, and timelines as defined by the SC.

The following provides preliminary budget estimates of the resources required to support this benchmark process. As the in-person portion of the model review meeting may be hosted in Halifax at the NAFO Secretariat office or by a Contracting Party, two options are presented.

Category	Estimated Cost (CAD)	Notes
External Reviewers		
Contracts for reviewers	$60,000	If reviewers are recruited from within NAFO CPs, then the associated reviewer compensation costs may not apply.
Total	**$60,000**	
Meeting for model review and development		
Option 1: Meeting hosted in Halifax, NS		
Venue and logistics	$500	Meeting hosted at the NAFO Headquarters
Administrative and coordination support	$0	
Invited reviewers	$14,000	Travel support for two invited experts
Contingency (10%)	$1,450	Unexpected expenses
Total	**$15,950**	
Option 2: Meeting hosted outside of Halifax, NS		
Venue and logistics	$0	Hosted by CP
Administrative and coordination support	$20,000	Travel, accommodations, and associated costs for NAFO Secretariat staff
Invited reviewers	$14,000	
Contingency (10%)	$3,400	Unexpected expenses
Total	**$37,400**	

SC notes that there are additional stocks which could benefit from benchmark processes, however it would not be feasible to deliver on more than two stocks at this time. Other identified stocks are described here briefly, including note of some main challenges which precluded their prioritization by SC at this time:

3M American plaice: Currently an index-based assessment. Last accepted analytical assessment was in 2020 (SCR Doc. 20/039). Age data are not currently available. Early development of a SPiCT surplus production model for this stock was presented in June 2026 but was not accepted. However, this approach should be further explored, and it is likely that progress can be made within STACFIS without a dedicated benchmark process. Indices suggest a recent increase in this stock.

3LNOPs thorny skate: Currently an index-based assessment. Modelling has been attempted using surplus production models (SCR Doc. 15/040) and with a state-space model integrating survey length compositions and fishery catches (Cadigan *et al.*, 2025). While these could form the basis of a benchmark process, there is currently no DE for this stock.

3M cod: Currently a SCAA analytical assessment. This stock is the most recent one to have undergone a benchmark within SC (SCS Doc. 18/18), and the model resulting from that benchmark remains appropriate. While the current assessment noted areas for model exploration or refinement, issues in recent assessments have been attributed primarily to a lack of aging data rather than an unsuitable modelling framework.

References

Alpoim, R., 2020. An Assessment of American Plaice (*Hippoglossoides platessoides*) in NAFO Division 3M. NAFO SCR Doc. 20/039.

Cadigan, N., R.M. Rideout, and P.M. Regular, 2022. A State-Space Assessment Model for 3NO Cod. NAFO SCR Doc. 22/039.

Cadigan, N., R.M. Rideout, 2022. A Mixed-Effects Model to Smooth and Interpolate Survey Weights-at-Age for 3NO Cod. NAFO SCR Doc. 22/040.

Cadigan, N.G., R.W. Steele, S.J.W.W.M.M.P. Weerasekera and M.R, Simpson, 2025. Early life-stage and adult productivity dynamics derived from a state-space stock assessment model for data-limited Thorny Skates (*Amblyraja radiata* Donovan, 1808) in NAFO Divisions 3LNO and Subdivision 3Ps. Fisheries Research, 286, 107396.

Kumar, R., D.A. Varkey, L. Wheeland, 2022. Spatial state-space survey-based stock assessment (SSURBA) model for the Grand Bank stock of American plaice. NAFO SCR Doc. 21/032.

NAFO, 2018. NAFO Scientific Council Flemish Cap (NAFO Div. 3M) Cod Stock Benchmark Assessment Meeting. NAFO SCS Doc. 18/18.

Perreault A.M.J., L. Wheeland, N.G. Cadigan, 2021. Updated state-space model for American plaice (*Hippoglossoides platessoides*) in Div. 3LNO. NAFO SCR Doc. 21/020.

Simpson, M.R., J.A. Bailey, R.K. Collins, C.M. Miri, and L.G.S. Mello, 2015. Limit reference points for Div. 3LNO Thorny Skate (*Amblyraja radiata* Donovan, 1808) and Div. 3NOPs White Hake (*Urophycis tenuis*, Mitchill 1815). NAFO SCR Doc. 15/040.

2. Coastal States

a) Request by Denmark (Greenland) for Advice on Management in 2027 (Annex 2)

Requests for management advice from Denmark (on behalf of Greenland) are presented in Annex 2 of Appendix V. Advice on stocks for which interim monitoring was requested is given in section 2c. below. Advice on *Pandalus borealis* is deferred to the September Scientific Council and STACFIS Shrimp Assessment Meeting.

b) Request by Canada on Management in 2027 (Annex 3)

Requests for management advice from Canada and Denmark (on behalf of Greenland) are presented in Annex 2 and 3 of Appendix V. Advice on stocks for which interim monitoring was requested is given in section 2c. below. Advice on *Pandalus borealis* is deferred to the September Scientific Council and STACFIS Shrimp Assessment Meeting.

Scientific Council responded:

Greenland halibut in Subarea 1 (inshore – Disko bay) Advice June 2026 for 2027 – 2028

Recommendation for 2027 - 2028

Following the application of the ICES guidance on data limited stocks (DLS) method 2.3, the Scientific Council advises that the TAC in 2027 and 2028 should not exceed 4 653 t.

Management objectives

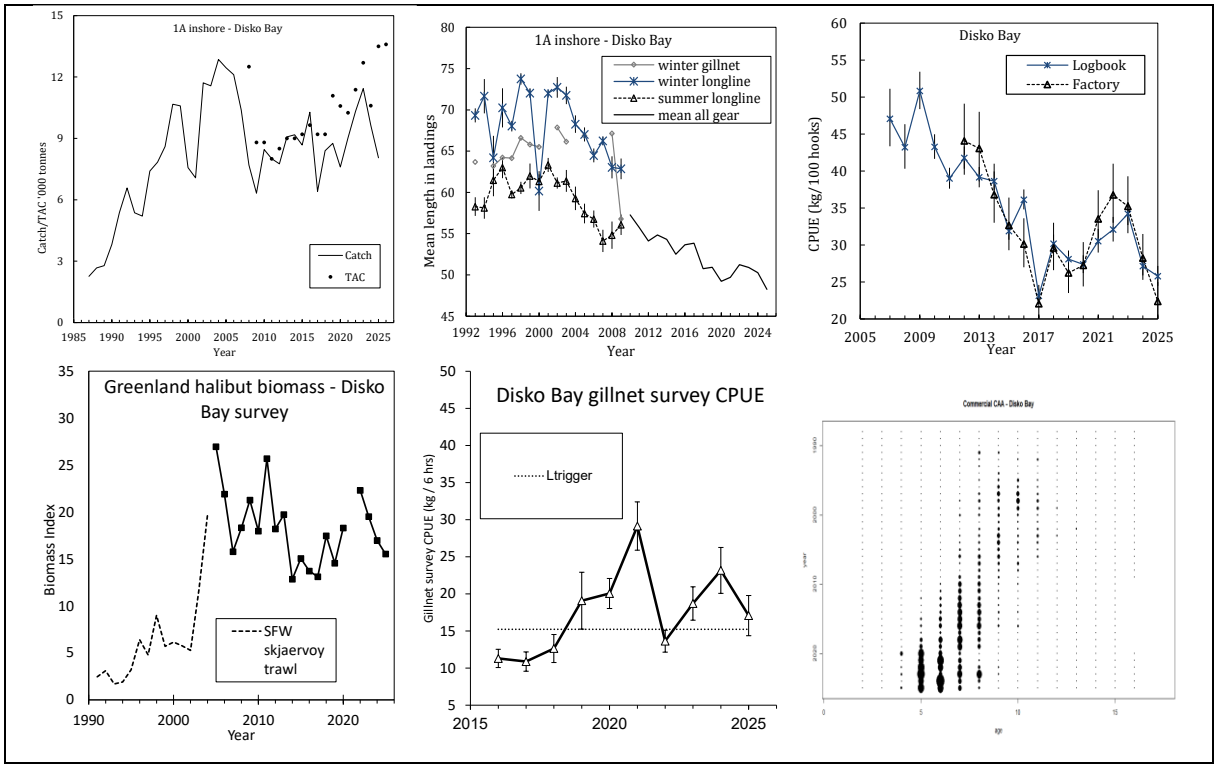
Denmark (on behalf of Greenland) requested an assessment of stock status and advice. No explicit management plan or management objectives have been defined by the Government of Greenland but a management plan is currently under development.

Management unit

Three inshore stocks in Division 1A (Disko Bay, Uummannaq, and Upernavik) are believed to recruit from the SA 0 +1 offshore stock. Separate advice is given for each area in Division 1A inshore. The Greenland halibut stocks in Subarea 0 + 1 (offshore) and Division 1A inshore are part of a larger population complex distributed throughout the Northwest Atlantic.

Stock status

Although total stock size is not quantified, all indices suggest biomass is declining. A fishing mortality proxy has not been calculated, but mean size of the landed fish has decreased from 57 cm in 2010 to less than 50 cm in 2025, which is suggestive of high fishing pressure. Recruitment is unknown.



Reference points

Could not be established.

Assessment

No analytical assessment was performed. Survey indices, and mean length in the landings, commercial CPUEs and catch at age information were used to monitor the stock.

The next full assessment is planned for 2028.

Basis for advice

ICES framework for category 3 stocks was applied (*rb* rule, Method 2.3; ICES 2025). The advice is based on the *rb* rule to provide precautionary advice. A survey biomass index (Disko Bay gillnet CPUE) was used as an indicator of stock development. This was considered the most appropriate survey index for the stock as it best represents commercially fished sizes. The advice is based on the mean catch (2021-2025) multiplied by the ratio of the mean of the last three index values (index A) and the mean of the four preceding values (index B), a biomass safeguard, and a precautionary multiplier. The stability clause was considered but not applied.

Greenland halibut in Division 1A inshore – Disko Bay. The basis for the catch scenarios. Catches are in tons. The figures in the table are rounded. Calculations were done with unrounded inputs, and computed values may not match exactly when calculated using the rounded figures in the table.

Mean Catch (2021-2025) used as A_y	9 700 t
Stock biomass trend	
Index A (2023 - 2025)	19.65 kg/6 hour
Index B (2019 - 2022)	20.48 kg/6 hour
r: Stock biomass trend (index ratio A/B)	0.96
Biomass safeguard	
Last index value (I_{2025})	17.08 kg/6 hour
Index trigger value ($I_{trigger}$)	15.23 kg/6 hour
b: index relative to trigger value, min{$I_{2025}/I_{trigger}$, 1}	1
Precautionary multiplier (ICES, 2025)	
m: multiplier (generic multiplier based on life history)	0.5
rb calculation: $A_y \times r \times b \times m$	4 653 t
Stability clause (+20%/−30% compared to A_y, only considered if b=1)	Not applied
Catch advice for 2027 and 2028*	4 653 t
% advice change**	−25%

* Formula rb rule: $A_y \times r \times b \times m$, limited by the stability clause if applicable.
** Advice value for 2027 and 2028 relative to the advice value for 2025 and 2026 (6 258 t).

Human impacts

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

Biology and environmental interactions

No studies were reviewed in this assessment.

Ecosystem sustainability of catches

The impact of bottom fishing activities on VMEs in SA 0 was assessed in 2016. Three areas have been designated as marine refuges, that exclude bottom contact fisheries: Disko Fan, Davis Strait and Hatton Basin. Areas in SA 1 have also been closed to bottom fishing to protect benthic habitats.

Greenland halibut is included in the piscivore guild. There are no EPUs or TCIs defined for this region. The ecosystem sustainability of catches cannot be evaluated.

Fishery

Catches increased in the 1980s, peaked from 2004 to 2006 at more than 12 000 t, but then decreased substantially to just above 6 000 t in 2009. From this level, catches gradually increased reaching 10 760 t in 2016. In 2017, catches were unusually low at 6 409 t. Subsequently, catches gradually increased to 11 435 t in 2023 and declined in 2024 and 2025 to 9 644 t and 8 053 t, respectively

Recent catches and TACs ('000 t) of Greenland halibut in Division 1A inshore – Disko Bay.

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
TAC	9.1	9.2	11.1	10.6	10.3	11.4	12.7	10.6	14.3	13.6
Catch[1]	6.4	8.4	8.8	7.6	9.0	10.3	11.4	9.6	8.1	

[1] STACFIS estimates

Effects of the fishery on the ecosystem

Greenland halibut in the area is targeted with longlines and gillnets. Both gears select adult fish with large body size and do not retain recruits or small sized fish. Impacts on VMEs have not been evaluated.

Greenland shark is a bycatch species of concern in the fishery given its low reproductive rate, slow growth rate and limited ecological information.

Special comments

Although the index provided by the Greenland shrimp and fish trawl survey experienced vessel changes in 2018 -2020, the results are considered to be comparable with those from earlier years.

Recruits are mainly received from the stock in SA 0 + 1 offshore.

The ICES Harvest Control Rule for data limited stocks used previously as the basis for giving TAC advice for this stock is no longer considered precautionary. Methods applied for this stock have been updated to align with current recommendations for data limited stocks.

Sources of Information
SCR Doc. 26/014, 017; SCS Doc. 26/11.

ICES, 2025. ICES Guidelines - Advice rules for stocks in category 2 and 3. Version 3. ICES Guidelines and Policies - Advice Technical Guidelines. 31 pp. https://doi.org/10.17895/ices.pub.28506179.

Greenland halibut in Subarea 1 (inshore – Uummannaq) Advice June 2026 for 2027 – 2028

Recommendation for 2027 and 2028

Scientific Council projected the fishing mortality scenarios defined for stocks in the Cautious Zone of the NAFO PA Framework. During the projection period (keeping F constant at the 2027 leaf values), there is a 65 to 79 % annual probability that the stock remains below $B_{trigger}$, and <1% to 3 % annual probability that the stock will be below B_{lim}.

Catches between 1 141 t and 2 707 t in 2027 are consistent with the HCR from the NAFO PA. Keeping F constant at the 2027 leaf values results in catches between 1 309 t and 2 956 t in 2028, maintaining F levels lower than would be expected under the defined leaf scenarios.

Management objectives

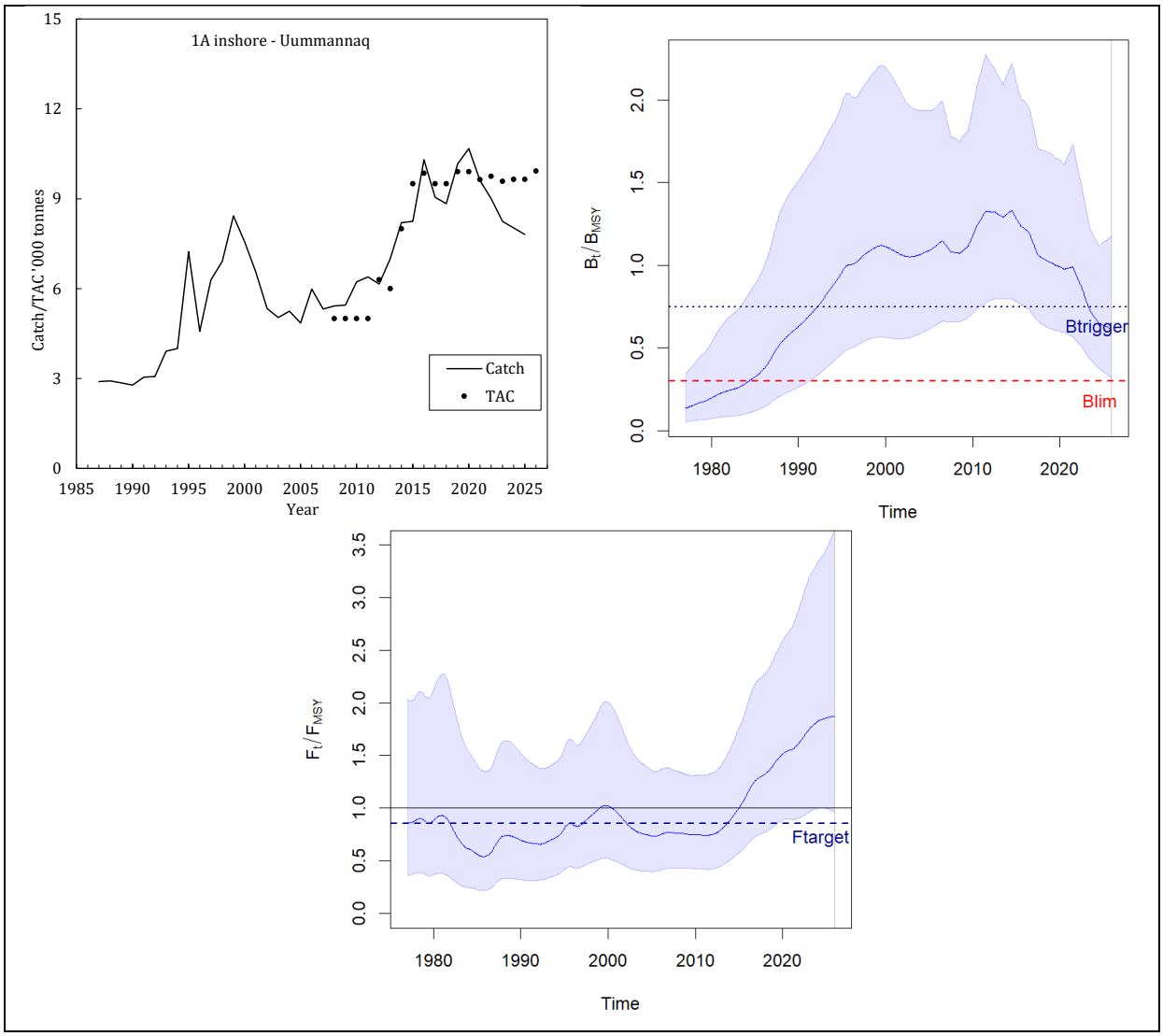
Denmark (on behalf of Greenland) requested an assessment of stock status and advice. No explicit management plan or management objectives have been defined by the Government of Greenland but a management plan is currently under development.

Management unit

Three inshore stocks in Division 1A (Disko Bay, Uummannaq, and Upernavik) are believed to recruit from the SA 0 + 1 offshore stock. Separate advice is given for each area in Division 1A inshore. The Greenland halibut stocks in Subarea 0 + 1 (offshore) and Division 1A inshore are part of a larger population complex distributed throughout the Northwest Atlantic.

Stock status

The stock is in the Cautious Zone of the NAFO PA Framework. In 2025, the median estimate of biomass was below $B_{trigger}$ but above B_{lim} with a 98% probability and the median estimate of fishing mortality is 1.9 times F_{lim}. Recruitment is unknown.



Reference points

B_{lim} is 30% B_{msy}. $B_{trigger}$ is 75% B_{msy}. F_{lim} is F_{msy}. F_{target} is 85% F_{msy}.

Projections

Medium-term projections were carried forward for catch scenarios with catch = TAC = 9 922 t for 2026. Constant *F* was applied from 2027-2028 at several levels of *F*, i.e. *F* = 0 and the NAFO PA Leaf (lower edge, mid and upper edge for 2027) for stocks in the Cautious Zone.

During the projection period (2027-beginning 2029), there is a 50 to 79 % annual probability that the stock remains below $B_{trigger}$, and <1% to 3 % annual probability that the stock will be below B_{lim} for the projected scenarios (excluding F=0). The annual probability of exceeding F_{lim} in 2027-2028 is lower than 16 % for the projected scenarios (excluding F=0). Projections show a 72 to 90 % probability that the stock will increase from 2026 to 2029 for the projected scenarios (excluding F=0).

Catch 2026 = 9 922 t (TAC)			
Year	*F*	Yield (t) Median	Projected Relative Biomass (B/B_{msy}) Median (80% CI)
F = 0			
2026	0.27	9 922	0.62 (0.43, 0.89)
2027	0.00	0	0.57 (0.36, 0.89)
2028	0.00	0	0.68 (0.44, 1.05)
2029	-	-	0.80 (0.53, 1.21)
Lower edge leaf			
2026	0.27	9 922	0.62 (0.43, 0.89)
2027	0.04	1 141	0.57 (0.36, 0.89)
2028	0.04	1 309	0.66 (0.42, 1.02)
2029	-	-	0.75 (0.49, 1.16)
Midrib leaf			
2026	0.27	9 922	0.62 (0.43, 0.89)
2027	0.07	2 015	0.57 (0.36, 0.89)
2028	0.07	2 250	0.64 (0.41, 1.00)
2029	-	-	0.71 (0.45, 1.12)
Upper edge leaf			
2026	0.27	9 922	0.62 (0.43, 0.89)
2027	0.09	2 707	0.57 (0.36, 0.89)
2028	0.09	2 956	0.62 (0.39, 0.99)
2029	-	-	0.68 (0.43, 1.09)

	Catch 2026 = 9 922 t (TAC)				
Cautious Zone		*F* = 0	*F* lower edge leaf in 2027	*F* midrib leaf in 2027	*F* upper edge leaf in 2027
Yield (t) Median	2026	9 922	9 922	9 922	9 922
	2027	0	1 141	2 015	2 707
	2028	0	1 309	2 250	2 956
$P(F>F_{lim})$	2026	99 %	99 %	99 %	99 %
	2027	<1 %	<1 %	2 %	14 %
	2028	<1 %	<1 %	3 %	16 %
$P(B<B_{lim})$	2026	<1 %	<1 %	<1 %	<1 %
	2027	3 %	3 %	3 %	3 %
	2028	<1 %	1 %	2 %	2 %
	2029	< 1 %	< 1 %	< 1 %	1 %
$P(F>F_{target})$	2026	> 99 %	> 99 %	> 99 %	> 99 %
	2027	<1 %	<1 %	7 %	28 %

	2028	<1 %	<1 %	8 %	29 %
P($B<B_{trigger}$)	2026	75 %	75 %	75 %	75 %
	2027	79 %	79 %	79 %	79 %
	2028	61 %	65 %	68 %	70 %
	2029	42 %	50 %	56 %	61 %
$P(B_{2029}>B_{2026})$		96 %	90 %	82 %	72 %
$(B_{2029}-B_{2026})/B_{2026}$		30 %	22 %	15 %	10 %

Assessment

A Stochastic surplus Production model in Continuous Time (SPiCT) was used for the assessment of this stock. Input data come from the research survey and the fishery.

The next full assessment of this stock is planned for 2028.

Human impacts

Mainly fishery related mortality. Other potential sources (e.g. pollution, shipping, and oil-industry) are undocumented.

Biology and environmental interactions

No specific studies were reviewed during this assessment.

Ecosystem sustainability of catches

The impact of bottom fishing activities on VMEs in SA 0 was assessed in 2016. Three areas have been designated as marine refuges, that exclude bottom contact fisheries: Disko Fan, Davis Strait, and Hatton Basin. Areas in SA 1 have also been closed to bottom fishing to protect benthic habitats.

Greenland halibut is included in the piscivore guild. There are no EPUs or TCIs defined for this region. The ecosystem sustainability of catches cannot be evaluated.

Fishery

Catches in the Uummannaq fjord gradually increased from the 1980s reaching 8 425 t in 1999 but then decreased to ~ 5 000 t in 2002. Since 2004, catches gradually increased reaching 10 670 t in 2020. Subsequently, catches decreased, reaching 7 812 t in 2025.

Recent catches and TACs ('000 t) are:

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
TAC	9.5	9.5	9.9	9.5	9.6	9.8	9.6	9.7	10.4	9.9
Catch[1]	9.0	8.8	10.2	10.7	9.6	9.0	8.3	8.0	7.8	

[1] STACFIS estimates

Effects of the fishery on the ecosystem

Greenland halibut in the area is targeted with longlines and gillnets. Both gears select adult fish with large body size and do not retain recruits or small sized fish. Impacts on VMEs have not been addressed.

Greenland shark is a bycatch species of concern in the fishery given its low reproductive rate, slow growth rate and limited ecological information.

Special comments

Recruits are mainly received from the stock in SA 0 + 1 offshore.

Commercial length frequencies are vital information and data from fish graders could improve the data input. Unfortunately, grader data has not been provided by the industry since October 2021.

Sources of information

SCR Docs. 26/016, 019, 024; SCS Doc. 26/11.

Greenland halibut in Subarea 1 (inshore – Upernavik) Advice June 2026 for 2027 – 2028

Recommendation for 2027 – 2028

Following the application of the ICES guidance on data limited stocks (DLS) method 2.3, the Scientific Council recommends that catch should not exceed 1 330 t.

Management objectives

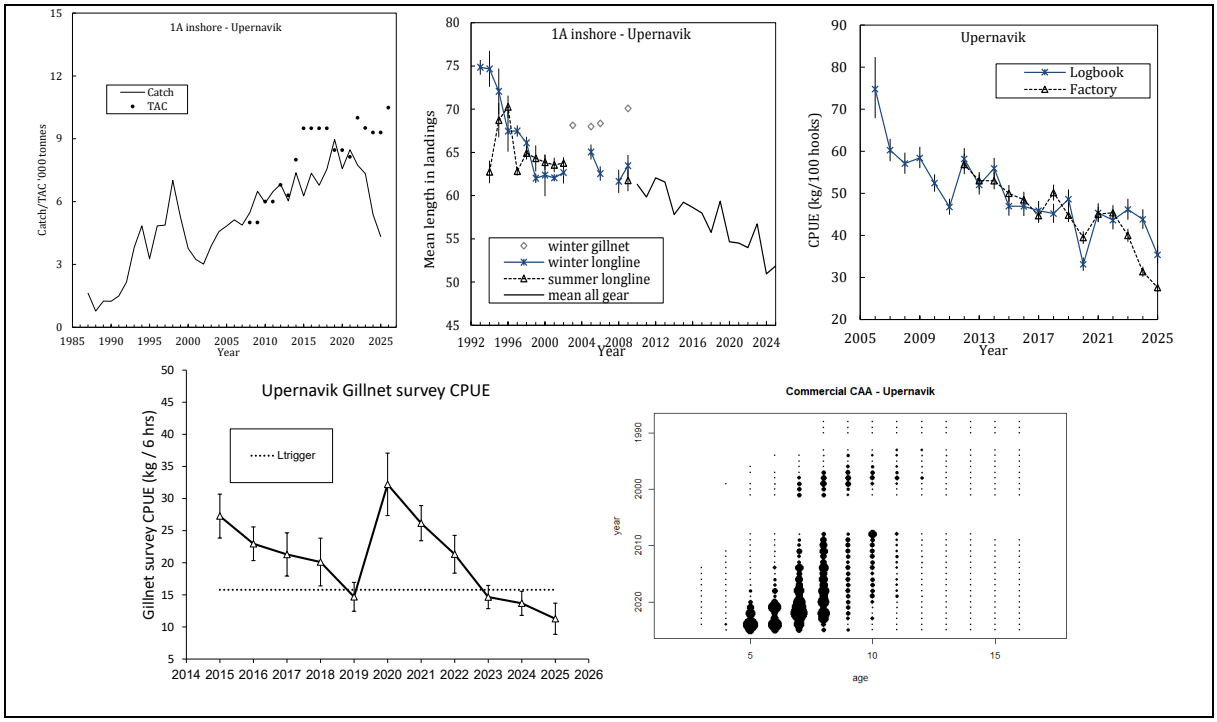
Denmark (on behalf of Greenland) requested an assessment of stock status and advice. No explicit management plan or management objectives have been defined by the Government of Greenland but a management plan is currently under development.

Management unit

Three inshore stocks in Division 1A (Disko Bay, Uummannaq, and Upernavik) are believed to recruit from the SA 0 + 1 offshore stock. Separate advice is given for each area in Division 1A inshore. The Greenland halibut stocks in Subarea 0 + 1 (offshore) and Division 1A inshore are part of a larger population complex distributed throughout the Northwest Atlantic.

Stock status

Although total stock size is not quantified, all indices suggest biomass is declining. Fishing mortality proxy has not been calculated, but mean size of the landed fish has decreased from 62 cm in 2013 to 52 cm in 2025, which is suggestive of high fishing pressure. Recruitment is unknown.



Reference points

Could not be established.

Assessment

No analytical assessment was performed. Survey indices, and mean length in the landings, commercial CPUE's and catch at age information were considered the best information to monitor the stock.

The next assessment is planned for 2028.

Basis for advice

ICES framework for category 3 stocks was applied (*rb* rule, Method 2.3; ICES 2025). The advice is based on the *rb* rule to provide precautionary advice. A survey biomass index (Upernavik gillnet CPUE) was used as an indicator of stock development. The advice is based on the mean catch (2021-2025) multiplied by the ratio of the mean of the last three index values (index A) to the mean of the four preceding values (index B), a biomass safeguard, and a precautionary multiplier. The stability clause was not considered.

Greenland halibut in Division 1A inshore – Upernavik. The basis for the catch scenarios. Catches are in tons. The figures in the table are rounded. Calculations were done with unrounded inputs, and computed values may not match exactly when calculated using the rounded figures in the table.

Mean Catch (2021-2025) used as A_y	6 652 t
Stock biomass trend	
Index A (2023-2025)	13.21 kg/6 hour
Index B (2019-2022)	23.60 kg/6 hour
r: Stock biomass trend (index ratio A/B)	0.56
Biomass safeguard	
Last index value (I_{2025})	11.28 kg/6 hour
Index trigger value ($I_{trigger}$)	15.79 kg/6 hour
b: index relative to trigger value, min{$I_{2025}/I_{trigger}$, 1}	0.715
Precautionary multiplier (ICES, 2025)	
m: multiplier (generic multiplier based on life history)	0.5
rb calculation: $A_y \times r \times b \times m$	1 330 t
Stability clause (+20%/−30% compared to A_y, only considered if b=1)	Not Applied
Catch advice for 2027 and 2028*	1 330 t
% advice change**	−77%

* Formula rb rule: $A_y \times r \times b \times m$, limited by the stability clause if applicable.
** Advice value for 2027 and 2028 relative to the advice value for 2025 and 2026 (5 801 t).

Human impacts

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

Biological and environmental interactions

No studies were reviewed in this assessment.

Ecosystem sustainability of catches

The impact of bottom fishing activities on VMEs in SA 0 was assessed in 2016. Three areas have been designated as marine refuges, that exclude bottom contact fisheries: Disko Fan, Davis Strait and Hatton Basin. Areas in SA 1 have also been closed to bottom fishing to protect benthic habitats.

Greenland halibut is included in the piscivore guild. Thereare no EPUs or TCIs defined for this region. The ecosystem sustainability of catches cannot be evaluated.

Fishery

Catches increased from the mid-1980s and peaked in 1998 at a level of 7 000 t. Landings then decreased sharply, but gradually increased to a level between 7 500 and 9 000 t until 2019 and subsequently decreased to 4 329 t in 2025.

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

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
TAC	9.7	9.5	8.5	8.5	9.9	10.0	9.5	9.3	11.0	10.5
Catch[1]	6.8	7.5	9.0	7.6	8.5	7.7	7.3	5.4	4.3	

[1] STACFIS estimates

Effects of the fishery on the ecosystem

Greenland halibut in the area is targeted with longlines and gillnets. Both gears select adult fish with large body size and do not retain recruits or small-sized fish. Ghost fishing by lost gillnets has been observed, but the extent of the impacts are unknown.

Greenland shark is a bycatch species of concern in the fishery given its low reproductive rate, slow growth rate and limited ecological information.

Special comments

Recruits are mainly received from the stock in SA 0 + 1 offshore.

The ICES Harvest Control Rule for data limited stocks used previously as the basis for giving TAC advice for this stock is no longer considered precautionary by ICES (ICES, 2025). Methods applied for this stock have been updated to align with current ICES recommendations for data limited stocks.

Sources of information

SCR Doc. 26/015, 018; SCS Doc. 26/011

ICES (2025). ICES Guidelines - Advice rules for stocks in category 2 and 3. Version 3. ICES Guidelines and Policies - Advice Technical Guidelines. 31 pp. https://doi.org/10.17895/ices.pub.28506179.

Demersal redfish and deep-sea redfish (*Sebastes* spp.) in Subarea 1 Advice June 2026 for 2027 – 2029

Recommendation for 2027 – 2029

The Scientific Council advises that there should be no directed fishery for deep-sea redfish and golden redfish and bycatch should be kept to the lowest possible level.

Management objectives

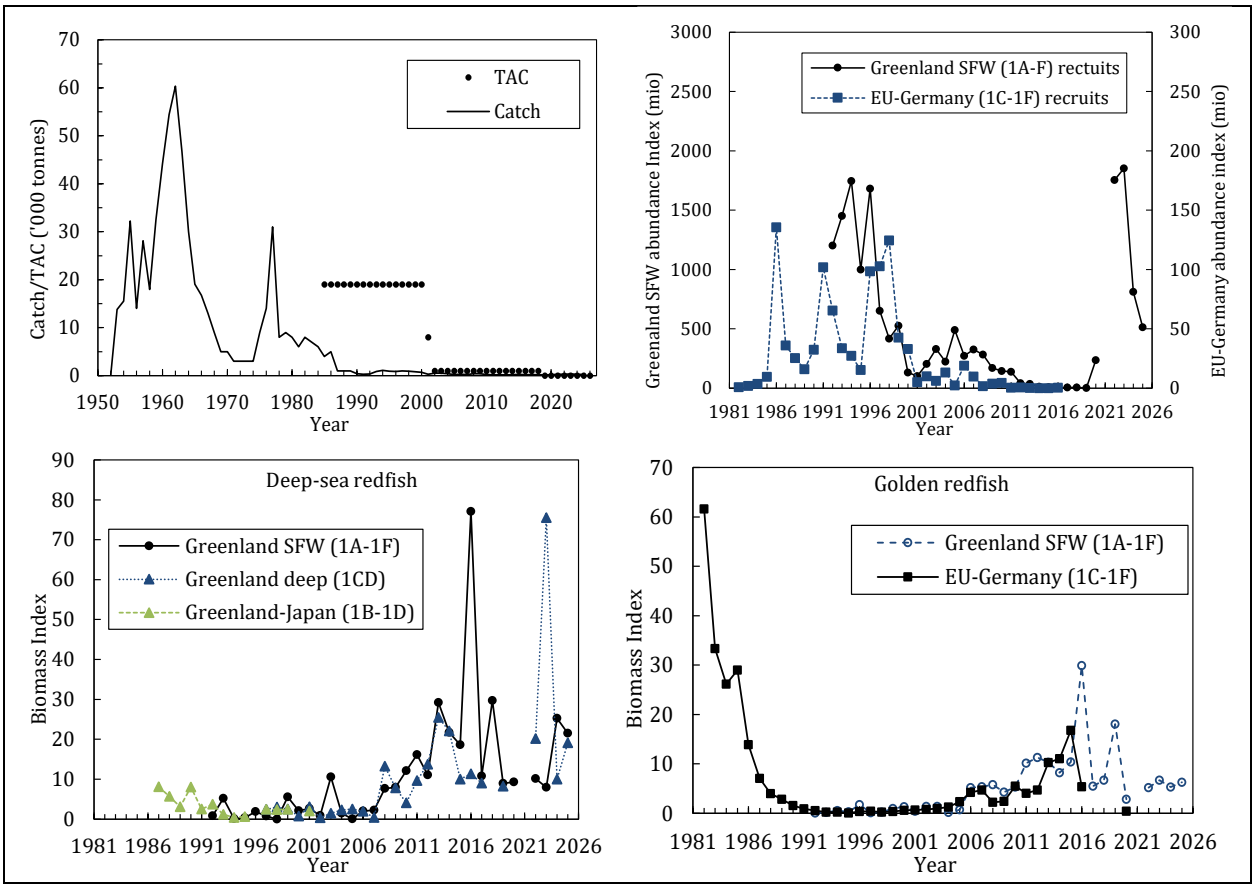
No explicit management plan or management objectives have been defined by the Government of Greenland.

Management unit

Golden redfish (*Sebastes norvegicus*) and deep-sea redfish (*Sebastes mentella*) are managed together as a single unit. Survey data reveal an almost continuous distribution of both species from East Greenland to West Greenland; both areas had geographically distinct fisheries historically. However, the degree of connectivity between the two areas is unknown.

Stock status

The biomass of golden redfish and deep-sea redfish remain below historical levels with few signs of recent recruitment. Fishing mortality is unknown.



Reference points
Could not be established.

Assessment

No analytical assessment was performed for either stock. The assessment is considered data-limited and with relatively high uncertainty, as surveys do not fully cover the distribution of the stock.

Human impacts
Mainly fishery related mortality. Other mortality sources (e.g. pollution, shipping, oil-industry) are undocumented.

Environmental impact
Unknown

Biological and environmental interactions

There is no integrated summary information available on the structure, status and trends of the marine ecosystem for the area inhabited by this stock.

Ecosystem sustainability of catches

There is currently no significant directed fishery in West Greenland. Recent landings of redfish are bycatches taken in other fisheries, mainly longline, gillnet or jigging in the inshore and coastal areas, and trawl in the offshore areas.

Redfish is included in the piscivore guild. There are currently no Ecosystem Production Units defined nor TCI information for the distribution area of this stock.

Fishery
Both redfish species are included as redfish in the catch statistics. The fishery targeting demersal redfish in SA 1 increased during the 1950s and peaked in 1962 at more than 60 000 t. Catches then decreased and have remained below 1 000 t per year after 1986 with few exceptions. Recent catches of redfish in SA 1 are a mixture of bycatches in shrimp and other fisheries.

Recent catch estimates (t) are as follows:

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
TAC	1000	1000	0	0	0	0	0	0	0	0
Catches[1]	222	194	142	194	256	291	325	284	211	

[1]STACFIS estimates

Special comments

There are no special comments for the stock.

Sources of information
SCR Doc. 20/052 26/011 012 013 022; SCS Doc. 26/11.

Wolffish in Subarea 1 Advice June 2026 for 2027 – 2029

Recommendation for 2027 – 2029

Given the lack of continued biomass increase, total catch (bycatch and directed) should not increase above the current five year average (227 t) for Atlantic and spotted wolffish combined.

Management objectives

No explicit management plan or management objectives have been defined by the Government of Greenland.

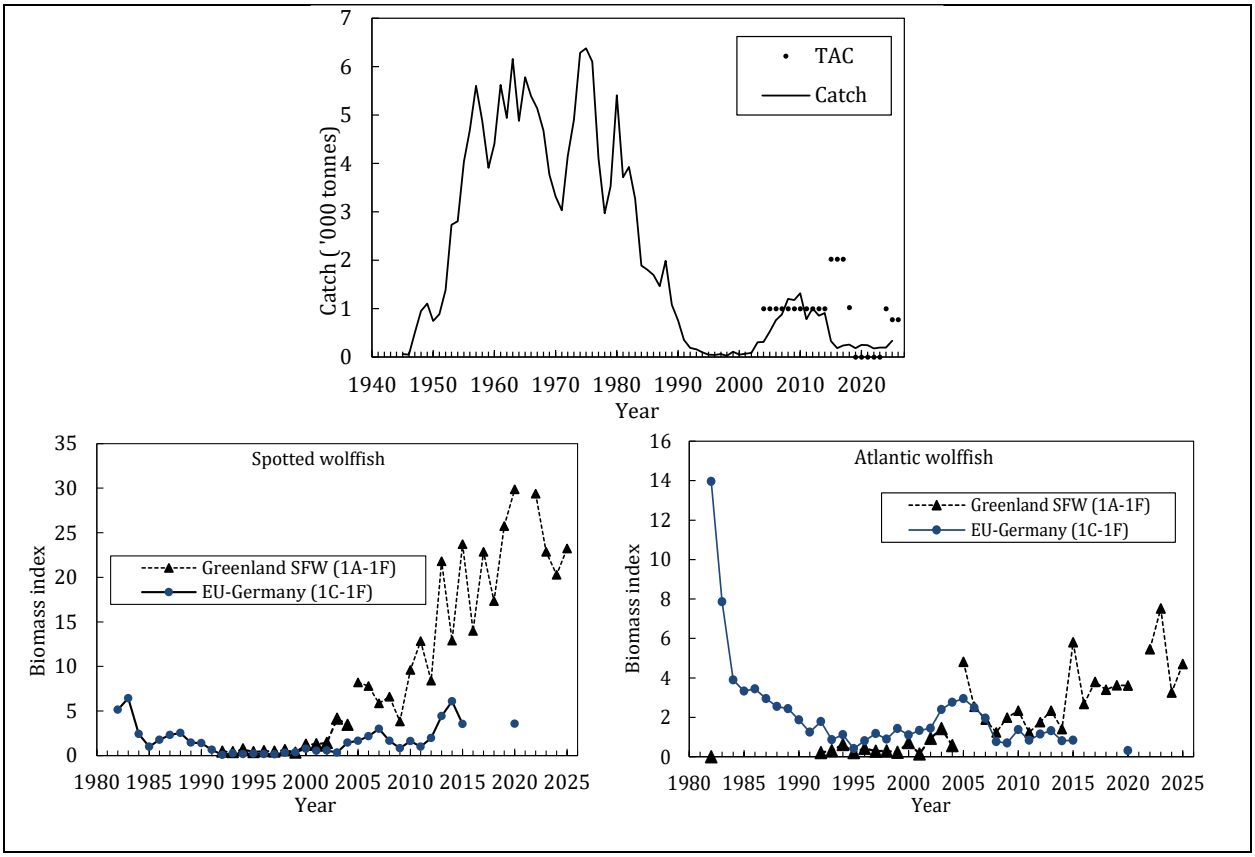
Management unit

Atlantic wolffish and spotted wolffish are both considered single units. Until 2025, both species were reported collectively as "wolffish" in fishery statistics.

Stock status

Atlantic wolffish: The biomass remains below the higher level of the 1980s. Recruitment and fishing mortality are unknown.

Spotted wolffish: Although the biomass and abundance indices have been increasing in the recent two decades, the indices have decreased since the most recent assessment in 2023. Recruitment and fishing mortality are unknown.



Reference points

Could not be established.

Assessment

No analytical assessment was performed for either stocks. The assessment is considered data limited and with relatively high uncertainty, as surveys do not fully cover the distribution of the stock.

The next assessment will be in 2029.

Human impacts

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

Biological and environmental interactions

There is no integrated summary information available on the structure, status and trends of the marine ecosystem for the area inhabited by this stock.

Ecosystem sustainability of catches

Wolffish is included in the piscivore guild. There are currently no Ecosystem Production Units defined nor TCI information for the distribution area of this stock.

Fishery

Wolffish are primarily taken as a bycatch in other fisheries. There is no information about the species split of the catches. The commercial fishery for wolffish in West Greenland occurred from the 1950s to 1979 with catches of around 5 000 t per year. After 1980, the cod fishery gradually stopped in West Greenland and catches of wolffish also decreased during this period. To minimize by-catch in the shrimp fishery, offshore trawlers targeting shrimp have been equipped with 22 mm grid separators since 2002 and inshore (Disko Bay) trawlers since 2011. Since 2015, reported catches have been at a lower level. A separate TAC is set for each species by the Government of Greenland.

Recent nominal catches of wolffish (t) and TAC.

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
TAC	2025	1025	0	0	0	0	1000	1000	775	775
Catch[1]	238	260	186	251	243	175	197	195	338	

[1]STACFIS estimates

Special comments

There are no special comments for either stock.

Sources of information
SCR Doc. 20/052, 26/011, 025 and SCS Doc. 26/11.

c) Monitoring of Stocks for which Multi-year Advice was provided in 2024 or 2025

Scientific Council recommends for:

Greenland halibut in Subarea 0+1 (offshore) for 2026-2027: Scientific Council projected the fishing mortality scenarios defined for stocks in the Healthy Zone of the PA Framework, and three additional harvest levels requested by a Coastal State. For all these scenarios the probability that the stock falls below B_{lim} in 2028 was <1% and below $B_{trigger}$ was less than 10%. F_{target} corresponds to catches of 30 243 t and 30 153t in 2026 and 2027, respectively. These catch levels have risks of 35% and 36% of exceeding F_{lim}, respectively.

VIII. REVIEW OF FUTURE MEETINGS ARRANGEMENTS

1. Scientific Council and STACFIS Shrimp Assessment Meeting, 15 – 17 September 2026

The Scientific Council and STACFIS Shrimp Assessment meeting will be held in Vilnius, Lithuania, 15 – 17 September 2026.

2. Scientific Council, 21 – 25 September 2026

The Scientific Council September 2026 meeting will be held in Vilnius, Lithuania, 21 - 25 September 2026.

3. WG-ESA, 10 – 19 November 2026

The Working Group on Ecosystem Science and Assessment will be held between 10-19 November, 2026, location to be determined.

4. STACREC, May 2027

The Standing Committee STACREC will meet by WebEx in May 2027. Date to be determined.

5. PA-WG Meeting, May 2027

The Precautionary Approach Working Group will meet by WebEx in May 2027. Date to be determined.

6. Scientific Council, June 2027

The Scientific Council June meeting will be held in Halifax, Nova Scotia, 28 May - 10 June 2027.

7. Scientific Council and STACFIS Shrimp Assessment Meeting, September 2027

Dates and location to be determined.

8. Scientific Council, September 2027

The Scientific Council September 2027 meeting will be held in the United Kingdom, 20 - 24 September 2027.

9. WG-ESA, November 2027

Dates and location to be determined.

10. NAFO/ICES Joint Groups

a) NIPAG, 2027

Dates and location to be determined.

b) ICES – NAFO Working Group on Deep-water Ecosystem (WG-DEC)

Dates and location to be determined.

c) WG-HARP

Dates and location to be determined.

11. Commission- Scientific Council Joint Working Groups

a) WG-EAFFM

The Joint Commission - Scientific Council Working Group on the Ecosystem approach to Fisheries Management will be held in Halifax, Canada, 03 – 05 August, 2026.

b) WG-RBMS

The Joint Commission - Scientific Council Working Group on Risk Based Management Systems will be held in Halifax, Canada, 05 – 07 August, 2026.

c) CESAG

The next meeting of the Catch Estimation Strategy Advisory Group (CESAG) will take place in Spring 2027 by correspondence.

IX. ARRANGEMENTS FOR SPECIAL SESSIONS

1. Topics for Future Special Sessions

a) Workshop on cod Division 3M readers

The Scientific Council agreed that a review of the comparative age reading for 3M cod should be carried out as there had not been a session on this since 2017. Currently, readers from Spain, Faroes and Norway read the 3M cod otoliths. An exchange between these readers would be very useful to try to establish a protocol.

b) Climate Change Meeting

Scientific Council, following a request from the Commission (Commission Request #10), has drafted a proposal for this special session which will be presented to the Commission at the 2026 September meeting.

2. Recently Attended Special Sessions

No special sessions were attended.

X. MEETING REPORTS

1. WG-ESA

The report of the Working Group on Ecosystem Science and Assessment (WG-ESA), held at the Instituto Español de Oceanografía (IEO), Madrid, Spain, from 4–12 November 2025 was presented by the Co-Chair Mar Sacau Cuadrado (EU) during the Scientific Council (SC) meeting.

WG-ESA work addressed two overarching goals: a) work intended to advance the Ecosystem Roadmap, typically involving medium- to long-term research; and b) work intended to address specific requests from the SC and/or Commission (COM), typically involving short- to medium-term analyses aligned with Roadmap priorities. In this context, the work carried out to support SC responses to COM requests addressed by WG-ESA was presented and discussed in plenary. Each COM request concludes with a brief summary of the key points and conclusions:

COM Request #1 (ANNEX A: Guidance for providing advice on Stocks Assessed). *In relation to Tier 1 of the Roadmap Scientific Council should provide annually catch information in relation to 2TCI, including recent cumulative catch levels and a scoping of expected cumulative catch levels. Ecosystem summary sheets should be monitored annually and updated on a five-year cycle.*

In the context of this COM Request, the interim monitoring of ecosystem conditions for 2024-2025 indicated that the changes observed in these EPUs are in line with already identified patterns and trends for these ecosystems, and therefore, do not meet the "significant ecological changes" criterion required to trigger an update of the Ecosystem Summary Sheets (ESSs) out of schedule. The next regular update of the ESSs for the Grand Bank (3LNO) and Flemish Cap (3M) EPUs is scheduled for 2028. The Ecosystem Designated Expert (EDE) position for the Grand Bank (3LNO) EPU remains vacant. If this position is not filled with sufficient time in advance for the work to be done, the 2028 regular update of the ESS for this EPU cannot be completed.

In addition, a summary of the DFO CSRF project (2025–2028) designed to update and improve the Ecosystem Production Potential (EPP)–Total Catch Index (TCI) framework used by NAFO to assess the risk of ecosystem overfishing, was presented to SC.

Also, as part of the implementation of Tier 1, a prototype application, provisionally named "TCI app", developed by SC for the interactive evaluation of the impacts of candidate TAC values on the risk of exceeding the 2TCI Ecosystem Reference Point, was presented at SC. The application allows managers to input TAC options and

assess in real time their effects on the scoped Catch/TCI ratios for the relevant functional guild and EPU, thereby facilitating COM discussions on the likely ecosystem impacts of alternative TAC scenarios.

Finally, the formalization of a full work plan for the 2028 update of the Ecosystem Summary Sheets, focusing on by-catch, discards, and the proposal for building an ETP species list was discussed.

COM Request #5. *In relation to the Ecosystem Roadmap as a whole, the Commission requests the Scientific Council, with input from the WG-EAFFM, to continue work on the development of a reference document detailing the ecosystem roadmap, for completion by the 2026 Annual Meeting.*

Regarding this COM Request, the SC has produced a document describing the Roadmap. This revised version incorporates the feedback received from managers on the preliminary draft circulated at WG-EAFFM in 2025. This Roadmap document will be tabled at the 2026 WG-EAFFM meeting for discussion and intended to be the basis for a submission to the Commission at the 2026 NAFO annual meeting for possible adoption.

COM Request #6. *In relation to the habitat impact assessment component of the Roadmap (VME and SAI analyses), the Commission requests that Scientific Council to:*

a) Continue to progress work on the centralized data repository using ArcGIS online to host the data and data-products for scientific advice, in conjunction with the NAFO Secretariat.

Concerning to this, SC acknowledged progress on the centralized ArcGIS Online repository and supported further improvements in data accessibility, traceability, and reproducibility, including enhanced metadata and tagging, workflow documentation, licensing clarity, standardized RV trawl data templates, proper recognition of data contributors, and the development of a standard acknowledgement text.

b) Work towards the reassessment of VMEs and impact of bottom fisheries on VMEs for 2027; including potential management options in the reassessment of bottom fisheries.

As part of this COM Request, SC updated VME delineation using 1995–2024 survey data, with areas largely consistent with 2019 but increases in most groups, especially Small Gorgonian Corals, while Large Gorgonian Corals and Black Corals showed little change in area extent. SC agreed on a 2027 SAI workplan, noting that secondary indicators cannot be updated, but primary indicators will be recalculated with updated datasets; as in 2021, secondary metrics do not change overall outcomes but help consolidate results. Current planning and delivery are highly dependent on the 2026 WG-ESA meeting format and location.

c) Develop materials on the potential of submitting NAFO coral bottom fishing closed areas as OECMs for discussion at the 2026 WG-EAFFM meeting.

With respect to this COM Request, SC drafted an OECM template submission for coral VME, from which a working paper was compiled by the NAFO Secretariat, noting that fishery closure Area 10 is included in the coral OECM but excluded from the sponge OECM submission due to its significant overlap with oil and gas exploration activities.

COM Request #10. *The Commission requests the Scientific Council, as workload allows, in consultation with the NAFO Secretariat, to draft a scoping document for a potential in-person meeting to explore approaches for further integrating information related to climate change throughout Scientific Council operations. This scoping document should identify the scientific expertise needed both within and outside Scientific Council and potential financial and workload implications.*

In this regard, a scoping document was developed outlining the objectives, structure, and expected outcomes of a potential in-person meeting aimed at exploring ways to further integrate climate change information across SC operations. The document was tabled as a WP during the 2026 SC June meeting, for discussion and final edits and will be presented for discussion at the 2026 WG-EAFFM and subsequently submitted to COM during the 2026 NAFO Annual Meeting.

The work carried out by WG-ESA is described in full in the working group report (SCS Doc. 25/16).

2. WG-DEC

Deferred to the September 2026 SC meeting.

3. WG-RBMS

The Chair of the Scientific Council, Diana González-Troncoso (EU), presented an update from the meeting that took place in April 2026 (COM-SC Doc. 26-01). At that meeting, the SC reported to the RBMS on the following points:

Progress in estimating reference points for implementing the new PAF: as there is no Chair of the PA-WG (as the position of SC co-Chair of the WG-RBMS is vacant), SC cancelled the meeting of this working group scheduled for May 2026. The WG-RBMS decided that the work will be undertaken during the 2026 June SC meeting, which may have an impact on the workload of the SC as there are 13 stocks scheduled for full assessment this year in June.

Guidance was asked by the SC for providing advice under the revised PAF when projections are not possible. WG-RBMS pointed out that the intention of the revised PAF was to provide advice that informs the Commission's decisions, including risk tolerance, but not for the SC to prescribe management decisions and risk tolerance levels. Further guidance is expected at the upcoming WG-RBMS meeting in August 2026.

There will be no exceptional circumstances for implementing the MP for Greenland halibut SA 2+Divs. 3KLMNO triggered in 2026 relating to the availability of survey indices, as none of the inputs are exceeding two missing values from a five-year period.

Progress on the Divs. 3LN redfish MSE: the WG-RBMS was informed that the work is ongoing and the OMs will be discussed at the 2026 June SC meeting.

Canadian MSE of SSAR shrimp: an overview on the northern shrimp MSE process that has been undertaken by Canada was presented. Additional domestic decisions within Canada, which would have implications for the MSE process, are still pending; Canada will provide further updates to the WG-RBMS during the August 2026 meeting.

SC requested clarification on Commission Request #11. It was noted that peer review was provided at the December 2025 CSAS meeting and therefore the Commission was not seeking an in-depth peer review of the OMs developed for the SSAR, but was requesting that the SC evaluate the general adequacy of the OMs developed in terms of their suitability for application in the NAFO context, drawing on experience from MSEs that have been implemented in NAFO previously. The review of the OMs is expected to occur at the 2026 June SC meeting.

Marine Stewardship Council (MSC) requirements under its Standard 3.0: it seems that the current proposal would not require NAFO fisheries to adopt harvest strategies tested using MSE. WG-RBMS will continue to monitor this issue.

4. WG-PA

The WG-PA did not meet in May 2026 due to the lack of Chair.

XI. GENERAL PLAN OF WORK FOR SEPTEMBER 2026 ANNUAL MEETING

No new issues were raised that will affect the regular workplan for the September meeting.

XII. OTHER MATTERS

1. Designated Experts

SC noted that currently Designated Experts for 3NOPs white hake, 3LNOPs thorny skate and Subareas 3+4 squid, as well as the 3LNO Ecosystem Designated Expert, are vacant. Stocks without a DE will not be assessed or monitored, so advice will not be provided. Very few CPs are providing DEs. SC **encourages** Contracting Parties to fill those positions.

A different case occurred for 3M golden redfish, 3M beaked redfish and 3M American plaice, where, in 2026, due to extraordinary circumstances, the DE position was vacant during the meeting, so the SC decided to issue

advice despite the DE's absence. The DE was working on the assessments and Interim Monitoring Report before the start of the meeting, and some members of the SC completed the work during the meeting.

From the Science Branch, Northwest Atlantic Fisheries Centre, Department of Fisheries and Oceans, St. John's, Newfoundland & Labrador, Canada

Cod in Div. 3NO	Rick Rideout	rick.rideout@dfo-mpo.gc.ca
American plaice in Div. 3LNO	Laura Wheeland	laura.wheeland@dfo-mpo.gc.ca
Witch flounder in Div. 3NO	Katherine Skanes	katherine.skanes@dfo-mpo.gc.ca
Yellowtail flounder in Div. 3LNO	Laura Wheeland	laura.wheeland@dfo-mpo.gc.ca
Greenland halibut in SA 2+3KLMNO	Paul Regular	paul.regular@dfo-mpo.gc.ca
Northern shrimp in Div. 3LNO	Nicolas Le Corre	nicolas.lecorre@dfo-mpo.gc.ca

From the Department of Fisheries and Oceans, Winnipeg, Manitoba, Canada

Greenland halibut in SA 0+1 (offshore)	Kevin Hedges	kevin.hedges@dfo-mpo.gc.ca

From the Department of Fisheries and Oceans, Ottawa, Ontario, Canada

Redfish Div. 3O	Danny Ings	danny.ings@dfo-mpo.gc.ca

From the Instituto Español de Oceanografía, Vigo (Pontevedra), Spain

Roughhead grenadier in SA 2+3	Fernando González-Costas	fernando.gonzalez@ieo.csic.es
Splendid alfonsino in Subarea 6	Fernando González-Costas	fernando.gonzalez@ieo.csic.es
Cod in Div. 3M	Irene Garrido Fernández	irene.garrido@ieo.csic.es
Northern Shrimp in Div. 3M	Jose Miguel Casas Sánchez	mikel.casas@ieo.csic.es
Ecosystem Designated Expert 3M	Diana González-Troncoso	diana.gonzalez@ieo.csic.es

From the Instituto Nacional de Recursos Biológicos (INRB/IPMA), Lisbon, Portugal

American plaice in Div. 3M	Ricardo Alpoim	ralpoim@ipma.pt
Golden redfish in Div. 3M	Ricardo Alpoim	ralpoim@ipma.pt
Redfish in Div. 3M	Ricardo Alpoim	ralpoim@ipma.pt
Redfish in Div. 3LN	Patricia Gonçalves	patricia@ipma.pt

From the Greenland Institute of Natural Resources, Nuuk, Greenland

Demersal Redfish in SA1	Rasmus Nygaard	rany@natur.gl
Wolfish in SA1	Rasmus Nygaard	rany@natur.gl
Greenland halibut in Div. 1 inshore	Rasmus Nygaard	rany@natur.gl
Northern shrimp in SA 0+1	AnnDorte Burmeister	anndorte@natur.gl
Northern shrimp in Denmark Strait	Tanja B. Buch	TaBb@natur.gl

From Knipovich Polar Research Institute of Marine Fisheries and Oceanography (PINRO), Russian Federation

Capelin in Div. 3NO	Konstantin Fomin	fomin@pinro.ru

Designated Expert Vacancies

Ecosystem Designated Expert 3LNO	VACANT
Northern Shortfin Squid in SA 3 & 4	VACANT
Thorny skate in Div. 3LNO	VACANT
White hake in Div. 3NO	VACANT

2. Election of Chairs

Diana González-Troncoso (EU) will continue as Scientific Council Chair and José De Oliveira (UK) will continue as STACFIS Chair. Rick Rideout (CA) will be the next STACREC Chair, vice-Chair of the Scientific Council, and SC co-Chair of CESAG. Irene Garrido (EU) will be the next STACFEN Chair. The Chair position for the STACPUB Committee will be vacant.

Mar Sacau (EU) will continue as the WG-ESA co-Chair, while the other co-Chair position is still vacant.

Diana González-Troncoso (EU) will be the next WG-RBMS SC co-Chair, and so the PA-WG Chair.

Mar Sacau (EU) will continue as WG-EAFFM SC co-Chair.

SC **encourages** all CPs to put candidates forward for Chair positions

3. Budget Items

The Secretariat presented for consideration to the Scientific Council the draft budget for 2027. The Scientific Council noted the need to increase the budget for SC Special Intersessional Meetings to account for the costs associated with the proposed benchmark process and climate change meeting (agenda items VII.1.d.xi and VII.1.d.xiii). The Secretariat was tasked with calculating the estimated costs for these items and updating the budget accordingly.

4. Rules of Procedure

Deferred to September.

5. Performance Review

Update on the progress of the NAFO ad hoc virtual Working Group to consider the initiation of a potential third Performance Review of NAFO (WG-PR) was presented by the SC Chair. While this is a Commission Working Group, the Chair and vice Chair of the SC were invited to attend the meetings as in September 2025 it was agreed by the Commission that the third Performance Review should be focused on the assessment of the scientific process within NAFO. Two meetings were held during the year, one on 20th January and the other on 28th April 2026. A first draft of the Terms of Reference for the third NAFO Performance Review was presented. The draft was based on the Terms of Reference from the 2018 NAFO Performance Review, but with the scope focused on the issue of the scientific process within NAFO as requested by the Commission. There were discussions inside the Working Group relating to the composition of the performance review panel, the details, and the draft work schedule for the process. Work is now ongoing in this matter via correspondence.

Discussions were held regarding those ToRs, and the ability to discuss them inside the SC before launching the third Performance Review. As this is a Commission WG, there is no obligation for the WG to share the results with the SC. However, an early review by SC can contribute significantly to the development of the ToRs, for example, providing an opportunity to flag gaps in the draft ToRs for further consideration of the WG prior to presentation to Commission. For that, SC is requesting an opportunity to review the ToRs for the Third Performance Review before they are presented to the Joint COM/SC session in September 2026.

6. ETP species

As part of the implementation of the NAFO Roadmap for an Ecosystem Approach to Fisheries (EAF), Ecosystem Summary Sheets (ESSs) provide a synoptic view on the state of NAFO ecosystems and their management regime, and constitute a tool for strategic assessment, advice and planning. The ESSs for the Grand Bank (Divs. 3LNO) and Flemish Cap (Div. 3M) Ecosystem Production Units (EPUs) are currently scheduled for an update in 2028.

One of the elements targeted for improvement in the next update of the ESSs is the evaluation of the significance of incidental mortality in fishing operation. This includes the consideration of incidental catches of species of conservation interest.

The goal of updating this element of the ESSs is to improve the effectiveness of the ESS for flagging potential biodiversity concerns associated to incidental catches in NAFO fishing operations, so that potential remedial management actions could be considered.

However, at present, NAFO does not have a formalized list of species of potential conservation concern and how this type of concept could inform catch reporting.

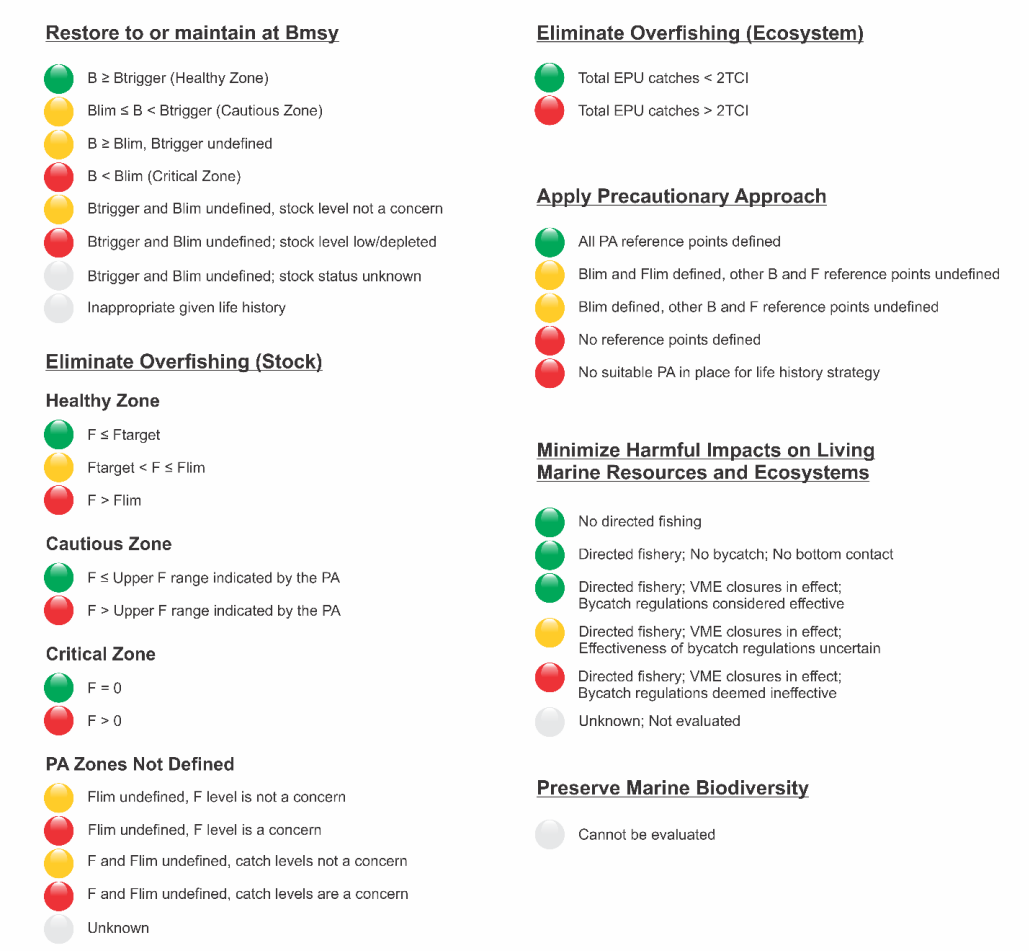
In order to operationalize this species list for the update of ESSs, a shortlist of species that are regularly represented in the commercial catch but are not yet managed through other NAFO regulations will be identified. The methods to assess species of potential conservation concern have yet to be developed. It is anticipated that the data from the EU 3M survey will be used as the starting point for this development.

7. Issues with the table in Annex A

Several issues when filling the Table 1 in Annex A of the Commission Request to Scientific Council were raised during the September 2025 SC meeting, mainly regarding the stocks in the Critical Zone and how to fill the Table for the stocks for which the range of Fs required in the table can not be derived, because no projections can be done or if the stock is assessed using an index-based approach. Scientific Council requested guidance to the WG-RBMS on how to proceed in these cases when going forward. At the 2026 April WG-RBMS meeting it was noted that the intent of the revised PAF was to provide advice that informs the Commission's decisions, including risk tolerance, but not for the Scientific Council to prescribe management decisions and risk tolerance levels. Canada agreed to work intersessionally, with assistance from interested Contracting Parties, to draft guidance for further discussion at the upcoming WG-RBMS meeting in August 2026.

8. NAFO Traffic Light

A Shiny Application with rules for assigning traffic light colours has been used in SC to construct summary tables for the advisory sheets since 2023. The rules used in the Shiny Application were previously based on the old PAF. In 2026 SC accepted a set of revised standard rules going forward for applying traffic light colours with considerations for the new PAF, particularly the inclusion of new reference points and the 'leaf' HCR. The use of the Shiny Application with these revised rules will in some instances result in traffic lights changing colour relative to previous reports. Further details are provided in SCR 26/007, but the selections available by default in the app and the assigned traffic light colours are summarized below:



References

Rideout, R.M. and M. Koen-Alonso, 2026. Implications of the Revised NAFO PA Framework for the Scientific Council traffic light approach to the provision of scientific advice. NAFO SCR Doc. 26/007.

9. Other Business

a) Greenland halibut in SA 0+1 offshore (monitor) updated advice

The Greenland halibut in SA 0+1 offshore stock is fully assessed every two years following a Request of a Coastal State (Denmark on behalf Greenland). This stock was fully assessed in June 2025, so this year the advice is given based on an Interim Monitoring Report (IMR).

In Annex 2 (*Denmark (on behalf of Greenland) requests for scientific advice on management in 2026 and beyond of certain stocks in subarea 0 and 1*), it is requested for this stock:

Advice on Greenland halibut, Offshore in Subareas 0 and 1 was given in 2025 for 2026 and 2027. The Scientific Council is requested to continue its monitoring of the stock and provide updated advice in the event of significant changes in stock levels.

In addition, Greenland specifically requests the catch scenarios for 35.328 tonnes (F_{msy} 2026) and F_{target} be updated for 2027-2029, with associated probability that biomass in the end of 2027-2029 is lower than 1) $B_{trigger}$ and 2) B_{lim}, i.e. p($B<B_{trigger}$) and p($B<B_{lim}$).

SC is unable to answer the second part of the request, as a full assessment would be required to do so. Therefore, having taken into account that no major changes in the state of the stock were found in the IMR, SC reiterates the advice given last year.

b) FAO Deep-sea Fisheries Project – update and recent outputs

Anthony Thompson updated the progress of the FAO Deep-Sea Fisheries (DSP) Project which started in 2022 and ends in 2027. Last year started with the FAO/NAFO/ICES EAFM symposium and ended with a research cruise in the Indian Ocean aboard the Norwegian research vessel R/V Dr. Fridtjof Nansen. Other notable work included the climate change work (NAFO portion presented to SC in 2024), a cross-sectoral workshop with international seabed authority (ISA) and the biodiversity beyond national jurisdiction (BBNJ) representatives, industry workshops, observer workshops, deepwater shark work including a new style identification key, DNA, eDNA, and improved use of ASFIS codes (including with the NAFO skate reporting), and a value-chain analysis. Activities in 2026 include a publication on implementing the precautionary approach, data-limited stock assessment methodology work with ICES, mapping ABNJ bottom fishing effort, and VME identification by commercial vessels. Two upcoming workshops are of note, a manager's meeting on developing EAF/PA/CC guidance and an RFMO communications workshop. FAO is in the process of designing a follow-up project.

The DSF project thanked the NAFO SC and Secretariat for its ongoing support as a project partner and looks forward to continued collaboration

c) A tribute to Ricardo Alpoim

Ricardo Alpoim (European Union - Portugal) was a valued member of the NAFO Scientific Council for almost 30 years. Ricardo was the NAFO Designated Expert for redfish, golden redfish, and American plaice in NAFO Division 3M, and worked as a research scientist at the Instituto Português do Mar e da Atmosfera, in Lisbon, Portugal. He also served as Chair of the Scientific Council (2010, 2011), and vice-Chair of Scientific Council and Chair of STACREC (2008, 2009). Ricardo passed away peacefully on Sunday, June 7th, 2026.

Ricardo was not only an outstanding scientist, but also a true gentleman and a loyal friend. Those who had the privilege of working with him will remember his good humor, his integrity, and the quiet grace with which he approached both his work and his relationships.

However, beyond his many professional achievements, Ricardo will be remembered above all for his extraordinary warmth, kindness, and spirit of camaraderie. His bonhomie and generosity of spirit created lasting bonds of friendship across the international community. He was the heart of Scientific Council. The Scientific Council held a moment of silence at the opening of the meeting on June 8th to remember such a dear friend and colleague.

XIII. ADOPTION OF COMMITTEE REPORTS

The Scientific Council, during the course of this meeting, reviewed the Standing Committee recommendations. Having considered each recommendation and also the text of the reports, the Scientific Council **adopted** the reports of STACREC, STACPUB and STACFIS. It was noted that some text insertions and modifications as discussed at this Scientific Council plenary will be incorporated later by the Scientific Council Chair and the Secretariat.

XIV. SCIENTIFIC COUNCIL RECOMMENDATIONS TO THE COMMISSION

The Scientific Council Chair undertook to address the recommendations from this meeting and to submit relevant ones to the Commission.

XV. ADOPTION OF SCIENTIFIC COUNCIL REPORT

At its concluding session on 11 June 2026, the Scientific Council considered the draft report of this meeting and adopted the report with the understanding that the Chair and the Secretariat will incorporate later the text insertions related to plenary sessions and other modifications as discussed at plenary.

XVI. ADJOURNMENT

The Chair thanked the participants for their hard work and cooperation, noting particularly the efforts of the Designated Experts and the Standing Committee Chairs. The Chair thanked the Secretariat for their valuable support and Saint Mary's University for the excellent facilities. The meeting was adjourned at 11:45 on 11 June 2026.

APPENDIX I. REPORT ON THE STANDING COMMITTEE ON FISHERIES ENVIRONMENT (STACFEN)

The state and trends in oceanographic conditions, and their long-term patterns that define the ocean climate, are key for a comprehensive understanding of stocks and ecosystem status and dynamics. In the Northwest Atlantic, ocean climate controls ecosystem-level productivity, with the effects being observed across multiple trophic-levels.

Recognizing the importance of environmental conditions for the productivity of fish stocks is not a new concept within SC. Since the times of ICNAF, NAFO's predecessor, SC has had working groups, and in more modern times, its Standing Committee on Fisheries Environment (STACFEN), dedicated to monitoring and understanding environmental conditions. With anthropogenic climate change increasingly impacting ecological and biological processes, a closer and deeper tracking of how ocean conditions are changing has never been more important.

Unfortunately**, the lack of Chair for STACFEN has forced SC to cancel the 2026 STACFEN meeting** that typically takes place during the SC June meeting. As a consequence, no environmental information was reviewed and made available to SC. There was no overview of the environmental conditions in 2025. The lack of this information may increase the uncertainty of stock assessments, as any potentially relevant environmental impacts may go undetected. This has been the first time that STACFEN has not met since its creation.

APPENDIX II. REPORT OF THE STANDING COMMITTEE ON PUBLICATIONS (STACPUB)

Chair: Rick Rideout Rapporteur: Andrea Perreault

The Committee met at the Atrium building, Saint Mary's University, Halifax, NS, Canada, on 01 June 2026 at 4:30 p.m., to consider publications and communications related topics and report on various matters referred to it by the Scientific Council. Representatives attended from Canada, European Union, Denmark (in respect of Faroe Islands and Greenland), Japan, Norway, Russian Federation, Ukraine, United Kingdom, and United States of America.

1. Opening

The Chair opened the meeting by welcoming the participants.

2. Appointment of Rapporteur

The NAFO Secretariat was appointed rapporteur.

3. Adoption of Agenda

The agenda was presented and adopted at the beginning of the meeting.

4. Review of Recommendations in 2025

There were three recommendations reviewed from the 2025 STACPUB Committee meeting:

STACPUB **recommends** *changing the citation on SCR documents from "Scientific Council Research Document, SCR Doc. 25/XXX" to "NAFO Scientific Council Research Document, NAFO SCR Doc. 25/XXX".*

Status: Implemented as of June 2025.

STACPUB **recommends** *adding clear guidelines for review/synthesis type papers to the JNAFS website*.

Status: The JNAFS Guidelines for Authors have been updated to include review papers. Additionally, the Guidelines have been reviewed and modernized to better reflect current publishing process.

STACPUB **recommends** *exploring options for delivering JNAFS notifications digitally to scientists in order to promote a broader familiarity with the journal and to potentially attract future paper submissions. This should include the development of a 'sign up for updates' link on the JNAFS website, but could also include the development of an email distribution list, and/or exploring ways to reach out via social media.*

Status: In progress. The JNAFS beta website underwent an update on the backend and a refresh of its web interface. This update was required in part to better facilitate the option of having a "sign up for updates" link. Further work is ongoing to determine the feasibility and practicality of implementing new ways to deliver JNAFS notifications digitally to scientists.

STACPUB **reiterates the recommendation** of *exploring options for delivering JNAFS notifications digitally to scientists in order to promote a broader familiarity with the journal and to potentially attract future paper submissions. This should include the development of a 'sign up for updates' link on the JNAFS website, but could also include the development of an email distribution list, and/or exploring ways to reach out via social media.*

5. Review of NAFO Publications

The NAFO Scientific Council Reports (Redbook) volume 47 for 2025 was published online in April 2026, and eight copies were printed. There were no NAFO Scientific Council Studies submissions published in 2025. The reports of the NAFO Joint Commission-Scientific Council meetings are found in the Meeting Proceedings for September 2024-August 2025, which was published online in December 2025. The Journal of Northwest Atlantic Fishery Science (JNAFS) Volume 56 was published online in December 2025 and included three articles. There were six submissions in total for 2025. Volume 57 has one article published to date. Details on the JNAFS Special Issue Volume 57 are detailed below.

6. Other Matters

a) JNAFS: Special Issue for the symposium on Applying the Ecosystem Approach to Fisheries Management in ABNJ

The STACPUB Chair provided an update on the JNAFS Special Issue on the symposium on Applying the Ecosystem Approach to Fisheries Management in ABNJ. At the time of the meeting, there were five papers accepted for publication and three under review. Publication of the special issue is planned for July 2026. Late submissions may still be considered as they are received.

b) Updates to SCR and JNAFS Guidelines

The STACPUB Chair noted that the Secretariat had drafted an update to the NAFO SCR Guidelines, which had last been updated in 1991. Clarification on the process of SCR approval was requested. The previous guidelines suggested that SCR documents were to be reviewed by the Scientific Council with the final acceptance of documents to be undertaken by the SC Chair. In general, this was still considered to be appropriate. However, it was discussed that clearer wording should be prepared to account for the fact that SCR documents are often prepared in meetings other than the main SC meetings (e.g. working group meetings), where the SC Chair may not be chairing the meeting or may not be present at all. Wording should also highlight the role of the Chair in discussing matters of concern in terms of publication of SCR documents with the NAFO SC Executive members and/or SC meeting participants in general. The Secretariat committed to coming up with appropriate wording to cover the role of the SC Chair or designated meeting Chair and to report back to STACPUB on this matter in a future meeting.

c) SCR Completion

The STACPUB Chair flagged the ongoing issue of documents being assigned SCR numbers, but in some cases, the final version of a document is not submitted by the author for online publication. It was noted that although the titles of the papers appear online, the documents are not actually available and this presents an issue in terms of traceability and reproducibility.

The STACPUB Chair strongly encouraged SC members with outstanding SCR documents to finalize them as quickly as possible, and for SC members to avoid this problem going forward.

d) Scientific Council Studies

The NAFO Scientific Council Studies were discussed, and it was suggested that the Scientific Council Studies could serve as a place to collate information on NAFO processes that have spanned many reports and years. The Secretariat noted that recent requests for information on the revised NAFO Precautionary Approach Framework and the NAFO Subarea 2 and Divisions 3KLMNO Greenland halibut MSE process that have been completed by the Secretariat could serve as candidates for this.

STACPUB **recommends** that *the Secretariat consider converting existing work on the revised NAFO Precautionary Approach Framework and the NAFO Subarea 2 and Divisions 3KLMNO Greenland halibut MSE process into summary documents, to be submitted for review by SC as Scientific Council Studies.*

e) Sharepoint Archival Content

At the 2018 June SC meeting, STACPUB recommended that the Secretariat explore ways to make SC meeting documents from previous meetings available on the SharePoint. To implement this recommendation, the NAFO Secretariat made available the SharePoint SC meeting sites for the previous years, creating an "archive" of content. This allowed users to revisit presentation folders, report text drafts, working papers and user folders. Since that time, SC also implemented a SC Working Paper archive, as per a 2022 STACPUB recommendation, where all working papers are now securely stored for SC members to browse. The report draft texts and presentations from SC meetings, are also currently stored in the files at the NAFO Secretariat in addition to being on SharePoint.

In late 2025, the NAFO Secretariat launched a new SharePoint platform. The previous SharePoint sites were migrated to the new platform, however clarification was requested on whether the archival of previous meeting sites on SharePoint was still required as per the 2018 recommendation, and if so, how many years of archiving

were deemed necessary moving forward. SC agreed that the recommendation from 2018 should continue and discussed how many years of archiving might be necessary.

STACPUB **recommends** that *the archival of previous meeting presentations and user folders continue to be maintained on the SharePoint SC meeting site for a four-year period. It was also noted that there was no need to maintain content that is now publicly available on the NAFO website (e.g. SCR, SCS docs).*

It was also emphasized that the Secretariat maintains a copy of all content from previous SC meetings and that access to content older than 4 years can be accomplished by simply contacting the Secretariat.

f) Figure Formats

The STACPUB Chair flagged that no further work on developing updated figure standards for SC documents has occurred since the 2025 June SC subgroup meeting.

g) NAFO Website

The STACPUB Chair reminded the Committee of an issue raised at the 2024 and 2025 STACPUB meetings regarding the lack of, or in some cases, the removal of science content from the NAFO website. The Secretariat reiterated that it requires input from SC members regarding any additional content and linkages to SC documents that they would like to see on the website. The website continues to be a work in progress and continues to advance as Secretariat resources permit.

7. Adjournment

The Chair thanked the participants for their valuable contributions.

APPENDIX III. REPORT OF THE STANDING COMMITTEE ON RESEARCH COORDINATION (STACREC)

Chair: Mark Simpson Rapporteur: Andrea Perreault

1. Opening

The Committee met on two occasions. First, a virtual meeting was conducted on May 5th, during which information on biological surveys carried out in 2025 in the NAFO Regulatory Area was presented, availability of catch data was reviewed and surveys from 2026 were discussed. Secondly, the Committee met on various occasions throughout the June Scientific Council meeting at the Atrium building, Saint Mary's University, Halifax, NS, Canada, to discuss matters pertaining to statistics and research referred to it by the Scientific Council. Representatives attended from Canada, Denmark (in respect of the Faroe Islands and Greenland), European Union, Japan, Norway Russian Federation, Ukraine, United Kingdom and the United States of America.

2. Appointment of Rapporteur

The meetings were preceded by the appointment of a Rapporteur. The NAFO Secretariat was appointed as rapporteur.

3. Review of Recommendations in 2025

Review of recommendations from 2025 and new recommendations from 2026:

a) Recommendations about redfish

Most of the surveys conducted (except for the EU-3M survey in recent years) record redfish without separating by species and STACREC **recommended** in 2018 that *all surveys should aim to examine redfish composition at the species level, while recognizing that this may not always be achievable due to trade-offs between different activities and aims of surveys.*

STACREC continues to discuss this recommendation. There are difficulties to achieve this task that were noted in 2018 (such as the lack of an agreed methodology for species identification that all surveys would use in a consistent manner, and lack of time and resources in some surveys to take on additional tasks). It was agreed that, as a first step, an attempt could be made at separating golden (*S. norvegicus*) from beaked (*S. mentella* and *S. fasciatus*) redfish for fish above a certain length, as this seems a relatively easy task.

A preliminary compilation of information on the stock structure of redfish in Division 3O in relation to adjoining redfish stocks (Units 2, 3Ps and 3LN) was presented in the June 2019 SC meeting. It was concluded that the initial basis for delineating stock structure was weak. STACREC **recommends** *a comprehensive study to investigate redfish stock structure in NAFO Subareas 2 and 3, with considerations of species splitting and recent approaches to studying redfish stock structure in other RFMOs.*

b) Recommendation about an external reviewer

During the June 2025 meeting it was recommended that an expert on Stochastic Production model in Continuous Time (SPiCT) attend the June 2026 meeting. An invitation was made to Casper Berg (National Institute of Aquatic Resources, Denmark, EU) for the June 2026 meeting to provide a presentation on SPiCT (see abstract in Other matters below).

SC **reiterates the recommendation** that *an external reviewer be invited to provide an independent peer review of the data and assessment methodology used for full stock assessments on an annual basis.*

c) Recommendations about silver hake

Canada is carrying out genetic and related population studies of silver hake throughout the NAFO Divisions 4VWXRST, subdivision 3Ps and Divisions 3NO. The intention was to present this results to SC in June 2026. SC has noted that significant catches (an average of 5 100 t over 2021-2025) of silver hake have occurred in recent years in Divs. 3NO in a fishery prosecuted primarily by EU-Spain but also Russia, EU-Estonia and Canada. This recommendation is deferred to the September 2026 Annual meeting.

d) Recommendation about the STATLANT 21B reporting template

At the 2025 June Scientific Council meeting, STACREC **recommended** that *the NAFO Secretariat review the STATLANT 21B reporting template with the goal of providing an updated reporting template for Scientific Council review*. The NAFO Secretariat presented an updated reporting template and noted that the next steps for finalizing the template would be to work with the FAO-CWP to make the relevant updates to the template and instructions.

STACREC **recommends** that *the NAFO Secretariat work with the FAO-CWP to update the STATLANT 21B reporting template and instructions.*

e) Recommendation about the STATLANT 21 submission rate information on the NAFO website

At the 2025 June Scientific Council meeting, STACREC **recommended** that *the NAFO Secretariat work to include the STATLANT 21 submission rate information, currently available in the STACREC reports, on the NAFO website with the STATLANT 21 databases*. The NAFO Secretariat presented the compilation of the submission information and it was agreed that the information should be posted on the STATLANT pages of the NAFO Website.

STACREC **recommends** that *the NAFO Secretariat post the compilation of STATLANT submission rate information on the STATLANT pages of the NAFO website.*

4. Fishery Statistics

a) Progress Report on Secretariat Activities in 2025/2026

i) Presentation of Catch Estimates from the CESAG, Daily Catch Reports and STATLANT 21A and 21B

The NAFO Secretariat presented the catch estimates developed by CESAG based on the strategy outlined in Annex 1 of COM-SC Doc. 17-08, amended following a recommendation from STACFIS in 2018, to include catch estimates of broken down by quarter and gear type.

In accordance with Rule 4.4 of the Rules of Procedure of the Scientific Council, as amended by Scientific Council in June 2006, the deadline dates for this year's submission of STATLANT 21A data and 21B data for the preceding year are 1 May and 31 August, respectively. The Secretariat produced a compilation of the countries that have submitted to STATLANT and made this available to the meeting (Table 1). It was noted that the STATLANT data are not complete for 2025 and discussions are ongoing relating to the submission of the STATLANT data as the Contracting Party of the European Union rather than by flag State.

Table 1. Dates of receipt of STATLANT 21A reports for 2023-2025 and 21B reports for 2022-2024 received as of 03 June 2026.

Country/ component	STATLANT 21A (deadline, 1 May)			STATLANT 21B (deadline, 31 August)		
	2023	2024	2025	2022	2023	2024
CAN-CA	28 May 24	11 Jun 25	27 Apr 26			
CAN-SF	03 May 24	30 Apr 25	23 Apr 26			
CAN-G	10 May 24	09 May 25	14 Apr 26	28 Aug 23	30 Aug 24	29 Aug 25
CAN-NL	30 Apr 24	30 Apr 25	30 Apr 26	31 Aug 23	09 Sep 24	03 Sep 25
CAN-Q			27 Apr 26			
CUB						
E/BUL						
E/EST	29 Apr 24	25 Apr 25	29 Apr 26		26 Aug 24	28 Aug 25
E/DNK	30 Apr 24	06 May 25			13 Aug 24	25 Aug 25
E/FRA						
E/DEU	30 Apr 24	12 May 25	26 May 26		15 Aug 24	28 Jul 25

E/LVA	30 Apr 24					21 Aug 25
E/LTU	23 Apr 24	28 Apr 25	13 Apr 26		31 May 24	
EU/POL						29 Jul 25
E/PRT						
E/ESP	24 Apr 24	28 Apr 25	29 May 26		23 Aug 24	14 July 25
GBR		30 Apr 25	29 Apr 26			21 Aug 25
FRO	30 Apr 24	16 May 25		07 Jun 23	30 Apr 24	16 May 25
GRL	01 May 24	23 May 25	27 Apr 26	22 Aug 23	30 Aug 24	
ISL		30 Jun 25				
JPN	24 Apr 24	22 Apr 25	22 Apr 26	30 Aug 23	29 Aug 24	26 Aug 25
KOR						
NOR	29 May 24 updated: 8 Aug 24	19 May 25	06 May 26		23 Aug 24	01 Sep 25
RUS	23 Apr 24	28 Apr 25	29 Apr 26	8 Sep 23	13 Sep 24	02 Sep 25
USA	7 May 24 updated: 29 Apr 25	29 Apr 25 updated: 01 May 26	01 May 26			
FRA-SP	26 Apr 24	28 May 25	27 Apr 26			18 Aug 25
UKR			24 Dec 25			

5. Research Activities

a) Biological Sampling

i) Report on Activities in 2025/2026

STACREC reviewed the list of Biological Sampling Data for 2025 prepared by the Secretariat and noted that any updates will be inserted during the summer. The SCS Document will be finalized for the September 2026 Meeting.

ii) Report by National Representative on Commercial Sampling Conducted

Canada-Newfoundland (SCS Doc. 26/07): Information was obtained from the various fisheries taking place in all areas from Subareas 0, 2, 3 and portions of Subarea 4. Information was included on fisheries for the following stocks/species: American plaice (SA 2 + Div. 3K, Divs. 3LNO, Subdiv. 3Ps), Atlantic cod (Divs. 2GH, Divs. 2J3KL, Divs. 3NO, Subdiv. 3Ps), Atlantic salmon (SA 2, SA 3, SA4), capelin (SA 2 + Divs. 3KL, Divs. 3NO), Greenland halibut (SA 2 + Divs. 3KLMNO), haddock (Divs. 3LNO, Subdiv. 3Ps), Iceland scallop (Divs. 2HJ, Divs. 3LNO, Subdiv. 3Ps, Div. 4R), American lobster (Div. 3K, Div. 3L, Div. 3Pn, Div. 3Ps, Div. 4R), pollock (Divs. 3LNO, Subdiv. 3Ps), Northern shrimp (SA 2 + Div. 3K, Divs. 3LNO), redfish (SA 2 + Div. 3K, Divs. 3LN, Div. 3O, Divs. 3P4VW), sea scallop (Divs. 3KLNO, Subdiv. 3Ps, Div. 4R), snow crab (Divs. 2HJ, Divs. 3KLNO, Subdiv. 3Ps, Div. 4R), squid (SA 2+3), capelin (Divs. 2J3KL), thorny skate (Divs. 3LNO, Subdiv 3Ps) and white hake (Divs. 3NO, Subdiv. 3Ps). Additionally, a summary of the recent environmental indices, some recent stock assessments and research projects for several of marine species are included in this report.

Denmark/Faroe Island (SCS Doc. 26/09): The Faroese fishery targets mainly cod in Subarea 3, with other species, such as Greenland halibut and redfish, being caught to a lesser extent. A total of 2 835.6 t of cod were recorded in 2025 of which 2 802.6 t were taken in 3M. The fishery has been conducted exclusively by longliners since 2017. Biological samples of cod have been collected since 2014 (length and weight measurements) and since 2021 samples also include age measurements. The number of length measurements taken in 2025 was 3 200 in a total of 28 samples. The Faroese quota of cod in 3M is 22.35% of the total.

Denmark/Greenland (SCS Doc. 26/11): Data on catch from STATLANT were obtained from trawl, gillnet and longline fisheries in NAFO Div. 1A-F for Atlantic halibut, Atlantic cod, capelin, Greenland cod, Greenland halibut, haddock, roundnose grenadier, roughhead grenadier, redfish, Greenland shark, northern prawn, northern rays, tusk and wolffish. Length frequencies from the commercial fisheries were mainly available for Atlantic cod and Greenland halibut. Sampling is done in a combination commercial sampling performed by vessel crews, land based automated sorting machines and GINR staff. Otolith and DNA sampling originate from surveys and frozen commercial catch sent to and processed by GINR.

EU-Germany: No biological sampling was conducted in the commercial fisheries in 2025.

EU-Portugal (SCS Doc. 26/10): In 2025, the Portuguese fleet operating in the NAFO Regulatory Area consisted of eight bottom trawlers. Fishing effort data, expressed in fishing days, were provided by the Portuguese administration. Biological sampling was carried out on board one stern trawler operating in NAFO Divisions 3L and 3M between February and September. In addition to species under moratoria, which are prioritized for sampling whenever they occur in the catches, biological sampling was conducted for the two most abundant species in each haul, following NAFO sampling recommendations. Redfish and Greenland halibut were sampled in Divisions 3M, 3L and 3N, while cod in Division 3M, and American plaice were sampled in Division 3M and 3L. Roughhead grenadier was sampled in Division 3L and 3N. A total of 121 samples were collected in 2025, comprising 7 901 length measurements and 2 876 otoliths collected.

EU-Spain (SCS Doc. 26/06): A total of 9 Spanish trawlers operated in Divs. 3LMNO of the NAFO Regulatory Area (NRA) during 2025, amounting to 1 403 days (21 833 hours) of fishing effort. Total catches for all species combined in Divs. 3LMNO were 20 705 tons.

In addition to NAFO observers (NAFO Observers Program), nine IEO scientific observer was onboard Spanish vessels during 2025, comprising a total of 311 observed fishing days, around 22% coverage of the total Spanish effort. Besides recording catches, discards and effort, these observers carried out biological sampling of the main species taken in the catch. For Greenland halibut, roughhead grenadier, American plaice and cod this includes recording weight at length, sex-ratio, maturity stages, performing stomach contents analyses and collecting material for reproductive studies. Otoliths of these four species were also taken for age determination. In 2025, 371 length samples were taken, with 44 594 individuals of different species examined to obtain the length distributions. Catch and length distributions of the following NAFO stocks have been presented in the 2025 Spanish Research Report: cod (Divs. 2J3KL, Divs. 3NO and Div. 3M), redfish (Divs. 3LN, Div. 3O and Div. 3M), American plaice (Divs. 3LNO and Div. 3M), witch flounder (Divs. 2J3KL, Divs. 3NO and Div. 3M), yellowtail flounder (Divs. 3LNO), Greenland halibut (Subareas 2 and Divs. 3KLMNO), thorny skate (Divs. 3LNO and Div. 3M), roughhead grenadier (Subarea 2 and 3), white hake (Divs. 3NO), squid (Divs. 3NO) and silver hake (Divs. 3NO).

During 2025 there was no fishing activity of the Spanish fleet in NAFO Division 6G.

Japan (NAFO SCS Doc. 26/04): One Japanese otter trawler operated in Divisions 3L and 3M in 2025. The total catch including discards was 1 277 tons in 2025. The main target species and stock area in 2025 was Greenland halibut (1 080 tons) in Division 3L. Following a recommendation from the 2023 September Scientific Council meeting, aggregated total catch length distributions for five stocks were calculated by Division based on the designated protocol. The aggregated total catch length distributions of Subarea 2 + Divs. 3KLMNO Greenland halibut in Division 3L formed unimodal in each year. The mean total length gradually decreased from 50 to 46 cm during 2016-2021 but gradually increased from 46 to 49 cm during 2021-2025.

Russia (SCS Doc. 26/05): Catch rates are available from Greenland halibut (Divs. 3LMN, with bycatch statistics), Atlantic cod (Div. 3M with bycatch statistics, Divs. 3LNO), redfish (Divs. 3LN, 3M, 3O, with bycatch statistics), witch flounder (Divs. 3LMNO), skates (Divs. 3LMNO), American plaice (Divs. 3LMNO), roughhead grenadier (Divs. 3LMN), grenadier spp. (Divs. 3LM), white hake (Divs. 3NO), Atlantic halibut (Divs. 3LMNO), silver hake (Divs. 3NO).

Length frequencies were obtained from Greenland halibut in Divs. 3LMNO, Acadian redfish (*Sebastes fasciatus*) in Divs. 3LMNO, beaked redfish (*Sebastes mentella*) in Divs. 3LM, golden redfish (*Sebastes norvegicus*) in Divs. 3LMN, roughhead grenadier in Divs. 3LMN, roundnose grenadier in Div. 3L, Atlantic cod in Divs. 3LMNO, blue wolffish in Divs. 3LMNO, Atlantic wolffish in Divs. 3LMNO, spotted wolffish in Divs. 3LMN, Atlantic halibut in Divs. 3LMNO, American plaice in Divs. 3LMNO, witch flounder in Divs. 3LMNO, black dogfish (*Centroscyllium*

fabricii) in Divs. 3LM, white hake in Divs. 3LMNO, red hake in Divs. 3LMO, longfin hake (*Phycis chesteri*) in Div. 3NO, three-bearded rockling (*Gaidropsarus ensis*) in Divs. 3LM, Arctic eelpout (*Lycodes reticulatus*) in Divs. 3LN, nezumia (*Nezumia bairdii*) in Divs. 3LMO, lancet fish (*Notoscopelus kroyeri*) in Div. 3M, haddock in Divs. 3LMO, Atlantic herring in Div. 3O, silver hake in Div. 3O, Kaup's arrowtooth eel (*Synaphobranchus kaupii*) in Divs. 3LM, American goosefish (*Lophius americanus*) in Divs. 3LO, thorny skate (*Raja radiata*) in Divs. 3LMNO, broadbill swordfish (*Xiphias gladius*) in Div. 3O, snubnosed spiny eel (*Notacanthus chemnitzii*) in Divs. 3LM, blue antimora (*Antimora rostrata*) in Divs. 3LM, salmo silus (*Argentina silus*) in Divs. 3MO. Age-length distribution for Greenland halibut in Divs. 3LMNO, Acadian redfish in Divs. 3LN, 3M and 3O, beaked redfish in Divs. 3LN, as well as statistics on marine mammal occurrences and VME indicator species catches, are also available.

USA: No biological sampling was reported in commercial fisheries in 2025.

iii) Report on Data Availability for Stock Assessments (by Designated Experts)

It was flagged that the 2023, 2024 and 2025 Div. 3M cod and redfish age length keys and maturity ogives from the EU Flemish Cap survey were not available for the 2024, 2025 and 2026 assessments.

b) Biological Surveys

i) Review of Survey Activities in 2025 and Early 2026 (by National Representatives and Designated Experts)

On May 5th 2026, a STACREC meeting reviewed the survey activity and data by contracting parties prior to the Scientific Council meeting in June. Information from recent surveys is summarized below:

Canada – Newfoundland and Labrador (SCR Doc 26/2): The Canadian multispecies bottom trawl survey designs cover an expansive spatial area, spanning six NAFO Divisions (2HJ3KLNO) and 515 000 km2 in the autumn and four NAFO Divisions (3LNOP) and 324 000 km2 in the spring. Coverage issues over the past decade or more were a result of aged vessels with frequent mechanical issues, impacts from the Covid-19 pandemic, and weather. New research vessels (CCGS John Cabot and CCGS Jacques Cartier) were introduced starting in 2021 and the extensive time and effort that went into comparative fishing trials between the new and old research vessels over 2021-2023 contributed to continued multispecies survey coverage issues in those years. Overall there have been systemic coverage issues for deep-water strata in the autumn survey, particularly those in Div. 2H and Div. 3L. Coverage of Div. 3L has been problematic in the spring survey as well. Recent surveys began with 20-30 % reductions in set allocations and the new research vessels have yet to demonstrate the capacity to cover the reduced allocation, let alone achieve full survey coverage. In the spring 2025 survey, 62% of intended fishing sets (i.e. the number of sets in the fully allocated survey design) were successfully completed, with 97% of intended strata covered with at least 2 fishing sets (i.e. the minimum standard for inclusion in stratified analyses). Although the 2025 spring survey covered almost all strata, it should be emphasized that survey coverage over most of Divs. 3LNO was a bare minimum (i.e. 2 sets per stratum) and this may influence the reliability of survey indices. In the 2025 autumn survey, 68% of intended fishing sets were successfully completed, with 83% of intended strata covered with at least 2 fishing sets. There was highly reduced survey coverage of strata in Div. 3K and deep strata in Div. 3L (>732 m). The persistent survey coverage issues, coupled with the lack of (or issues related to) conversion factors between new and old research vessels for some species have resulted in years being dropped from survey analyses, breaks in data time series, and major challenges and increased uncertainty in the provision of science advice regarding fisheries resources. The Canadian (NL) survey report contains trends in fish functional groups, as well as trends in survey indices and various biological data for a broad range of demersal fishes. Summaries for stocks pertinent to NAFO were included in the STACREC presentation, while those considered Canadian domestic stocks were included in the report but not presented.

Canada – Subarea 0 (SCR Doc 26/021): During 1999-2017 surveys were completed in Div. 0A-south (to 72°N) using the RV Pâmiut with an Alfredo III trawl. In 2018 the RV Pâmiut was retired and a replacement vessel was not available. In 2019 the CV Helga Maria was used as an interim vessel with the Alfredo III trawl and trawl doors from the RV Pâmiut, but data analyses detected significant differences in catchability below 700 m, therefore the survey was not used to assess Greenland halibut stock status. Surveys in Subarea 0 were completed during 2022-2025 using the RV Tarajoq with a Bacalao trawl; this vessel and trawl will be used for the survey in future years. Survey stratification was expanded in 2022 relative to previous years, adding a 200-400 m depth stratum and expanding the survey to include all of Div. 0B. The survey now fishes the following

depth strata in each of Divs. 0A-south and 0B: 201-400, 401-600, 601-800, 801-1000, 1001-1200, 1201-1400, 1401-1500 m. The survey was planned with 30 days at-sea to complete 79 stations in Div. 0A-south and 110 stations in Div. 0B. The 2025 survey completed 78/79 stations in Div. 0A-south and 72/110 stations in Div. 0B. The missed station in Div. 0A-south was in the 201-400 m stratum. The missed stations in Div. 0B included 36/60 stations in the 201-400 m stratum, and one station in each of the 801-1000 and 1001-1200 m strata. All survey strata had sufficient completed stations for inclusion in biomass index calculations.

Denmark/Greenland (SCS 25/12): Data on catch rates from STATLANT were obtained from trawl, gillnet and longline fisheries in NAFO Div. 1A-F for Atlantic halibut, Atlantic cod, black dogfish, capelin, Greenland cod, Greenland halibut, haddock, roundnose grenadier, roughhead grenadier, redfish, Greenland shark, northern prawn, northern rays, tusk and wolffish. Length frequencies from Greenland were available for Greenland halibut from trawl offshore fishery in 1AB and 1CD, longline fishery in 1A, 1D, and 1F inshore, gillnet fishery in 1A inshore. A total of 8 011 otoliths in Div. 1A-F from cod, redfish, and Greenland halibut were collected.

EU-Spain and EU-Portugal (SCR Docs 26/001, 003): The EU bottom trawl survey in Flemish Cap (Div. 3M) was carried out on board R/V Vizconde de Eza using the usual survey gear (Lofoten) from July 7th to August 8th, 2025. The area surveyed was Flemish Cap Bank to depths up to 800 fathoms (1460 m) following the same procedure as in previous years. The number of hauls was 189 and seven of them were null. Survey results including abundance indices of the main commercial species and age distributions for cod, redfish, American plaice, roughhead grenadier and Greenland halibut are presented as a Scientific Council Research document. Flemish Cap survey results for Northern shrimp (*Pandalus borealis*) were presented in SCR 25/044. Samples for histological assessment of sexual maturity of cod, redfish, Greenland halibut and roughhead grenadier were taken. Oceanography studies continued to take place and 76 CTD stations were carry out during the survey.

Since 1995, EU-Spain carries out annually a spring-summer bottom trawl survey in the NAFO Regulatory Area of Divs. 3NO. This survey was conducted from 7th of June to the 7th of July 2025 on board the R/V Vizconde de Eza. The gear was a Campelen otter trawl with 20 mm mesh size in the cod-end. Following the method used last year, a total of 113 valid hauls were taken within a depth range of 45-1450 m according to a stratified random design and 113 hydrographic profiles. Furthermore, stratified sampling by length class and sex was used to sample otoliths of Atlantic cod, American plaice, Greenland halibut and silver hake for growth studies. Also, gonads of American plaice and silver hake were sampled from histological maturity and fecundity studies. The results of this survey, including biomass indices with their errors and length distributions, as well as the abundance length frequencies for Greenland halibut, American plaice, Atlantic cod, yellowtail flounder, redfish, witch flounder, roughhead grenadier, thorny skate and white hake are presented as Scientific Council Research Documents. In addition, age distributions are presented for Greenland halibut and Atlantic cod.

In 2003 it was decided to extend the EU-Spain Divs. 3NO survey toward Div. 3L (Flemish Pass). In 2025, the bottom trawl survey in Flemish Pass was carried out on board R/V Vizconde de Eza using the usual survey gear (Campelen 1800) from August 11th to 29th. The area surveyed was Flemish Pass to depths up 800 fathoms (1463 m) following the same procedure as in previous years. The number of hauls was 90 and 8 of them were null. Survey results, including abundance indices and length distributions of the main commercial species, are presented as Scientific Council Research documents. Samples for histological (American plaice and roughhead grenadier) and aging (Greenland halibut, American plaice, roughhead grenadier and cod) studies were taken. Eighty-two hydrographic profile samplings were made in a depth range of 120-1429 m.

VME data from the 2025 EU-Spain; EU-Spain and Portugal bottom trawl groundfish surveys in NAFO Regulatory Area (Divs. 3LMNO):

During 2025, R/V Vizconde de Eza carried out three surveys: 1) In Division 3L (Flemish Pass) sampling between 125 - 1467 meters depth, with a total of 90 tows (82 valid); 2) in Division 3M (Flemish Cap) sampling between 135 - 1464 m depth, with a total of 189 tows (182 valid); and 3) in Divisions 3NO (Grand Banks of Newfoundland) sampling between 46- 1444 m depth with a total of 116 tows (113 valid). In total there were 377 bottom trawl tows, 18 of them considered invalid due to technical problems during fishing operations. In addition, 8 hauls were conducted inside VME closures. 109 hauls out of 377 valid tows have shown zero catches (i.e. no presence) of VME indicator species groups. This represents 28.91% of the total valid hauls. A brief description of the methods used to identify, map and delineate VMEs from groundfish survey data is provided by Durán Muñoz *et al.* (2020).

Sponges were recorded in 203 of the 377 valid tows (53.85% of valid tows analyzed), at mean depths between 135 and 1467 m. There was one significant catch of sponges (≥ 100 kg/tow) in these tows, which fell outside the VME polygons for sponges, but inside VME closures.

Large gorgonians were recorded in 4 of the 377 valid tows (1.06% of valid tows analyzed), at mean depths between 572 and 681 m. There was one significant catch of large gorgonians (≥ 0.6 kg/tow) in these tows, which fell outside VME closed areas and outside the VME polygons for large gorgonians.

Small gorgonians were recorded in 57 of the 377 valid tows (15.12% of valid tows analyzed), at mean depths between 231 and 1464 m. There were no significant catches of small gorgonians (≥ 0.2 kg/tow) in these tows. Sea pens were recorded in 160 of the 377 valid tows (42.44% of valid tows analyzed), at mean depths between 66 and 1448 m. There was one significant catch of sea pens (≥ 1.3 kg/tow) in these tows, which fell within the VME polygons for sea pens, but outside VME closures.

Black corals were recorded in 31 of the 377 valid tows (8.22% of valid tows analyzed), at mean depths between 231 and 1265 m. There were two significant catches of black corals (≥ 0.4 kg/tow) in these tows, both of which fell outside the VME polygons for black corals and outside VME closures.

Sea squirts (*Boltenia ovifera*) were recorded in 7 of the 377 valid tows (1.86% of valid tows analyzed), at mean depths between 57 and 681 m. There was one significant catch of sea squirts (≥ 0.35 kg/tow) in these tows, which fell within the VME polygons for sea squirts and outside VME closures.

Bryozoans were recorded in 30 of the 377 valid tows (7.96% of valid tows analyzed), at mean depths between 46 and 1199 m. There were no significant catches of bryozoans (≥ 0.2 kg/tow) in these tows.

References

Durán Muñoz, P., Sacau, M., García-Alegre, A., and Román, E. (2020). Cold-water corals and deep-sea sponges by-catch mitigation: Dealing with groundfish survey data in the management of the Northwest Atlantic Ocean high seas fisheries. *Marine Policy*, *116*, 103712.

BATISCAFO: In 2025, as part of the BATISCAFO project (Buscando fortAlecer la inTegracIón de los datoS eCosistémicos en el Asesoramiento a la NAFO y otras Organizaciones), funded by the CSIC through a special intramural project (PIE), various studies were carried out on activities other than fishing in the NRA:

a) New data on seabed macrolitter (EU Spain/Portugal Groundfish Surveys 2024).

New records and densities of seabed macrolitter in Divs. 3LMNO were obtained from opportunistic sampling during the 2024 EU–Spain/Portugal groundfish surveys, following the revised protocol developed in the NEREIDA project (SCR 25/051). A total of 388 valid bottom trawl hauls were analyzed, yielding ~238 items in 32.2% of hauls. Mean densities were 16.6 ± 47.1 items/km^2 and 52 ± 758 kg/km^2.

Fisheries related litter was most abundant (52.2%), followed by plastic (29%), metal (8%), other anthropogenic litter (4%), rubber (3%), organic litter (3%), and glass/ceramics (1%). Using OSPAR source specific indicators, fisheries were identified as the main source (58%), followed by galley waste (4%) and operational waste (1%), with 37% uncertain. These results update seabed litter distribution in 3LMNO and contribute to improving the macrolitter protocol. A full update is expected at WG-ESA 2026. Details appear in SCR Doc. 25/051.

b) Monitoring of PAH metabolites in fish species (Flemish Cap pilot study).

The pilot study on PAH metabolites in Flemish Cap aims to detect these compounds in the bile of Greenland halibut, roughhead grenadier and witch flounder as early indicators of exposure to contamination. It will also help to establish baseline levels for these pollutants in the area. During the 2025 EU Spain/Portugal survey, gallbladder samples were collected from specimens of the aforementioned species, from both the control areas (north/east Flemish Cap) and study areas (west Flemish Cap, near oil and gas activities). Part of the samples will be analyzed at the Spanish Institute of Oceanography using HPLC with fluorescence detection. An update is expected at WG-ESA 2026.

USA (SCS/XX): During Fiscal Year 2025 (covering October 1, 2024, through September 30, 2025), the National Oceanic and Atmospheric Administration (NOAA) Northeast Fisheries Science Center (NEFSC) successfully executed all 16 planned ship-based research surveys. Scientific parties, officers, and crew members logged

more than 300 days-at-sea (DAS) conducting comprehensive monitoring, biological sampling, and oceanographic data collection across the U.S. Northeast Continental Shelf ecosystem.

Consistent with the geographic coverage described in prior U.S. submittals (SCR 24/039; SCS Doc. 24/012) and the NAFO inventory of biological surveys, the FY2025 survey program spans NAFO Subareas 4, 5, and 6 — from the Scotian Shelf and Gulf of Maine (Subarea 4, Div. X; Subarea 5, Div. Y) through Georges Bank (Subarea 5, Divs. Z/Ze/Zw) to Southern New England and the Mid-Atlantic Bight (Subarea 6, Divs. A, B, C).

Operational milestones and mission fulfillment metrics varied significantly by platform and seasonal window:

- Nine out of the sixteen scheduled surveys achieved greater than 90% of their planned operational and scientific mission objectives.
- Seven surveys concluded with less than 90% of their planned mission completed. These shortfalls were predominantly driven by marine crew shortages, unexpected mechanical malfunctions, repair backlogs, and poor weather windows.

Fleet Performance Breakdown

Vessel execution efficiency based on the platform class:

- NEFSC Vessel Gloria Michelle successfully achieved a 100% DAS execution rate across its scheduled projects.
- Commercial Fishery Charters delivered a combined 90.5% DAS execution rate.
- The NOAA Ship Henry B. Bigelow executed 81.6% of its scheduled operational days, while the NOAA Ship Pisces completed 70% of its planned sea days.

Survey Technical Note for Spring and Fall Multi-Species Bottom Trawl Survey & Other Surveys

The NEFSC conducted its multispecies bottom trawl surveys in 2025 using a stratified random design. The spatial domain for these surveys targets the continental shelf spanning from Cape Lookout, North Carolina, northward to the Scotian Shelf (NAFO Subareas 4, 5, and 6), with a target allocation of approximately 370 stations per cruise. The program maintains two historical series consisting of a spring cruise (operating since 1968) and an autumn cruise (operating since 1963). Station selection is randomized inside designated strata polygons bounded by depth ranges of 27–55 m, 55–110 m, 110–182 m, and 182–366 m. Data collection areas are directly tied to the research vessels utilized, moving from historical platforms (1963–2008) to the FSV Henry Bigelow (2009–2025). While the spring 2025 survey achieved a high rate of station completion with 98% of planned trawls executed, the autumn 2025 survey suffered severe operational deficits due to mechanical and weather delays, dropping to a 68% completion rate. An added fourth leg ensured that 100% of the design strata were sampled, large sectors of the Gulf of Maine (NAFO Subarea 5, Div. Y) and eastern Georges Bank (NAFO Subarea 5, Div. Ze) resulted in reduced station density.

For the 2028 operational cycle, the primary research vessel FSV Henry Bigelow will be offline for one year to undergo mandatory mid-life maintenance in dry dock. Consequently, the spring 2026 bottom trawl survey and 20-sea-day habitat cruise planned for the Gulf of Maine (NAFO Subarea 5, Div. Y), were reallocated to its sister platform, the FSV Pisces, for training and cross-vessel calibration in advance of the 2028 field season. This platform transition places the United States alongside other contracting parties in facing critical requirements for cross-vessel calibration and catchability assessments to maintain long-term time-series continuity. Despite the autumn 2025 bottom trawl coverage shortfalls, the aggregate scientific output which included regional and charter vessel assets, across all 2025 USA survey matrices represented a substantial data collection enterprise. Across all core bottom trawl and specialized monitoring programs, field teams successfully documented 406 fish and invertebrate species, processed 386,328 individual length measurements, completed 10,745 feeding ecology stomach content observations, collected 19,648 age structures (otoliths and scales) for growth modeling, and secured 32,950 additional biological samples for laboratory analyses.

In addition to the standard demersal bottom trawl lines, the US highlighted multiple specialized, industry-collaborative, and protected species surveys conducted in 2025 to monitor the wider ecosystem. Benthic resource surveys included a sea scallop dredge survey (Subarea 5, Div. Z; Subarea 6, Divs. A, B, C) and a sea scallop stereo-optic camera transect survey (Subarea 5, Div. Ze; Subarea 6, Div. B), as well as a cooperative surfclam and ocean quahog dredge survey (Subarea 5, Divs. Zw, Ze; Subarea 6, Divs. A, B, C) on a commercial

industry vessel. Fixed and mobile gear programs featured a cooperative bottom longline survey in the Gulf of Maine (Subarea 5, Divs. Y, Z) on commercial vessels and a trial recreational fisheries hook-and-line survey. Environmental and pelagic sampling was maintained through comprehensive ecosystem monitoring cruises across three distinct seasons (spring, fall, and winter) to capture hydrographic and plankton profiles, alongside dedicated wind energy area surveys using uncrewed systems and ship-based environmental monitoring, and specialized bluefin tuna slope-sea surveys (Close Kin Mark Recapture, ship-based ichthyoplankton). Protected species assessments were carried out through dedicated marine mammal and cetacean biology tracking surveys (Subareas 4, 5; Divs. D, Ze, Zw), which prioritized shipboard and aerial line-transect surveys for the North Atlantic right whale (Subareas 4, Subarea 5).

Detailed information for completed survey operations can be found here: https://www.fisheries.noaa.gov/feature-story/fiscal-year-2025-northeast-ship-based-survey-review

Faroes 3M: The Faroes survey did not occur in 2025. It is expected that the survey will resume in 2026.

c) Tagging Activities

An update on cod and flatfish tagging and telemetry undertaken by Canada is included in SCS Doc. 26/07. There were no updates to further tagging activities.

d) Other Research Activities

There were no other research activities presented.

6. Invited Speaker (Casper Berg)

SPiCT (Stochastic Production model in Continuous Time) is an increasingly adopted biomass dynamic modelling framework designed to support fisheries stock assessment and management under uncertainty. This presentation provided an introduction to the SPiCT model structure, key assumptions, and practical applications, with emphasis on its current use within ICES assessments and its relevance for NAFO processes. SPiCT combines surplus production dynamics with state-space estimation methods, allowing explicit separation of process and observation error while incorporating uncertainty in catches, survey indices, and fishing mortality dynamics. The presentation reviewed the core model equations, including stochastic biomass and fishing mortality processes, observation models for catch and index data, and alternative formulations for temporal variability and seasonality.

Special attention was given to practical implementation issues, including data requirements, treatment of catch and CPUE/survey information, the role of priors, and recommended good practices for model fitting and diagnostics. Comparisons with age-structured assessment models demonstrate how SPiCT can provide robust and transparent estimates of stock status and reference points while remaining computationally efficient. Recent methodological developments, including hindcast cross-validation, process residual diagnostics, time-varying productivity, and precautionary management applications, were also highlighted. The presentation concluded with guidance on available software resources, documentation, and key references supporting the continued development and application of SPiCT in fisheries science and management.

7. Review of SCR and SCS Documents

There were no documents to be revised.

8. Other Matters

a) Silver hake (Rosario Domínguez-Petit; Instituto Español de Oceanografía, Vigo, Spain)

Silver hake (*Merluccius bilinearis*) catches in NAFO Divisions 3Ps, 3O, and southern 3N have increased markedly since 2018, likely linked to ecosystem changes associated with ocean warming. To validate the macroscopic maturity ogive of this species, gonad samples were collected during EU-Spain scientific surveys conducted in Divisions 3NO in 2024 and 2025. Histological analyses were performed on 94 individuals ranging from 24 to 57 cm total length. Results revealed 22 males, 54 females, and 18 intersex individuals, representing a notably high intersex prevalence of 19%. Intersex prevalence was slightly higher in 2024 (21%) than in 2025 (16%). Three morphological intersex types were identified, differing in the distribution and maturity of male and

female tissues within the gonads. Most intersex specimens were smaller than 38 cm. All sampled individuals were mature, preventing estimation of a microscopic maturity ogive. Previous reports of intersex in the genus Merluccius are extremely rare, making this the first documented case of such high prevalence. Potential causes may include environmental stressors, endocrine-disrupting contaminants, and climate-related changes. Future coordinated sampling and contaminant analyses are planned to investigate the underlying drivers and assess population-wide prevalence.

b) Template for the Provision of Scientific Advice when a Designated Expert Position is Vacant

At the 5th May 2026 STACREC meeting, the Chair raised the issue of Designated Expert vacancies and proposed a template for how to address Interim Monitoring Reports when this occurs. The template was noted by the group and was raised for further discussion on the first day of the May 29th - June 11th 2026 Scientific Council Meeting. Further details on the relevant conclusions are found in Section XII.1 of the Scientific Council report.

9. Adjournment

The meeting was adjourned on 10th June 2026.

APPENDIX IV: REPORT OF THE STANDING COMMITTEE ON FISHERIES SCIENCE (STACFIS)

Chair: José De Oliveira Rapporteur: Andrea Perreault

I. OPENING

The Committee met from 29 May – 11 June 2026 to consider and report on matters referred to it by the Scientific Council, particularly those pertaining to the provision of scientific advice on certain fish stocks. Representatives attended from Canada, Denmark (in respect of Faroe Islands and Greenland), the European Union, Japan, Norway, the Russian Federation, Ukraine, the United Kingdom, and the United States of America. Observers from Atlantic Groundfish Council and Oceans North were also present. The Executive Secretary and other members of the Secretariat were in attendance. The Chair, José De Oliveira (UK) opened the meeting by welcoming participants. The agenda was reviewed, and a plan of work developed for the meeting in accordance with the Scientific Council plan of work. The provisional agenda was adopted. Owing to the limited time available during the meeting, it was not possible to consider drafts of all report sections in plenary. As in previous years, designated reviewers were assigned for each stock for which an interim monitoring update was scheduled (see SC Report). Following presentation and discussion of full assessments, Designated Experts produced drafts of their respective report sections which were reviewed in plenary.

II. GENERAL REVIEW OF CATCHES AND FISHING ACTIVITY

1. Review of Recommendations

STACFIS agreed that relevant stock-by-stock recommendations from previous years would be considered during the review of a stock assessment or noted within Interim Monitoring Report as the case may be and the status presented in the relevant sections of the STACFIS report.

2. General Review of Catch and Fishing Activity

The NAFO Secretariat presented the catch estimates developed by CESAG and made the supplementary data that went into the analyses available for the Scientific Council to review. The Secretariat noted that the catches were estimated based on the strategy outlined in Annex 1 of COM-SC Doc. 17-08, amended following a recommendation from STACFIS in 2018, to include catch estimates broken down by quarter and gear type. It was also noted that some Contracting Parties had not submitted catch for 2025 at the time of the meeting; it was for this reason, and to avoid confusion and duplication of information, that the decision was taken to remove STATLANT 21A catches reported in the table of recent TACs and catches for most stocks.

3. Invited Speaker and External Review

No invited speakers or external reviewers were invited to participate in the meeting this year in STACFIS.

III. STOCK ASSESSMENTS

STOCKS OFF GREENLAND AND IN DAVIS STRAIT: SA 0 AND SA 1

Environmental Overview

The STACFEN Committee did not meet during the 2026 SC June meeting. Therefore, no environmental overviews, including the update of environmental conditions for 2025, were available to SC. The lack of this information increases the uncertainty of all stock assessments, as any potentially relevant environmental connections would have gone undetected.

1. Greenland halibut (*Reinhardtius hippoglossoides*) in Subareas 0+1 offshore

Interim Monitoring Report. SCR Docs. 20/015, 23/032, 26/011, 012, 021,029; SCS Doc. 26/11.

a) Introduction

A TAC for Greenland halibut in Subarea 0+1 (offshore) was established in 1994, following the separation of the 1A inshore stock from the offshore stock. In 2020 the 1B-F inshore stocks were also separated from the offshore stock. Catches have increased in response to TAC increases, from approximately 9 000 t in 1994 to 36 400 t in 2019. TAC remained at 36 400 t from 2019 to 2022 with catches following that relatively closely. The main stock index could not be updated during 2018-2021 following the retirement of the survey vessel. A new survey timeseries started in 2022 with the introduction of a new survey vessel and gear. In 2023, with increasing uncertainty in stock status following several years without an updated stock index, NAFO SC recommended the TAC not exceed 2013-17 TAC levels, a period when the stock varied without trend. The TAC for 2023 to 2025 was reduced by 9.25%, to 33 005 t. For 2026 the TAC was increased to 35 328 t (Table 1.1 and Figure 1.1).

Table 1.1. Recent catches and TACs ('000 t)

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
TAC	32.3	32.3	36.4	36.4	36.4	36.4	33.0	33.0	33.0	35.3
SA 0	15.9	16.0	18.3	17.9	19.1 [b]	18.6 [b]	16.4[b]	16.5[b]	16.8[b]	
SA 1	16.2	16.2	18.0	18.1	17.3	18.8	16.6[c]	16.5[c]	16.7[c]	
Total Catches[a]	32.1	32.2	36.3	36.0	36.4	37.15	33.0	33.0	33.5	

[a] Based on STATLANT, with information from Canada and Greenland authorities to exclude inshore catches.

[b] STACFIS estimate using 1.5 conversion factor for J-cut, tailed product.

[c] STACFIS estimate based on official catches from the Greenland Fisheries and Hunting Control Authority (GFJK).

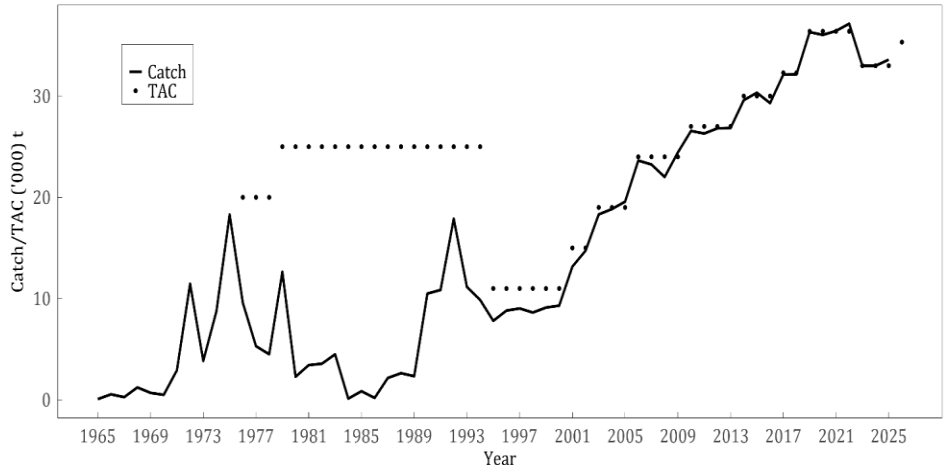


Figure 1.1. Greenland halibut in Subareas 0+1 (offshore): total allowable catch (TAC; dotted line) and total catch estimates (black line).

b) Data overview

Canada deep-water survey SA0: Since 1999 Canada has conducted surveys in Subarea 0. Surveys in 0A-south (to 72°N) were conducted with varying frequency from 1999 to 2025 (Figure 1.2 top panels). The 2006 survey had poor coverage and was not considered valid. Biomass in Div. 0A-south varied with an increasing trend from 1999 to 2016 followed by a marked decline in 2017 (Figure 1.2). Surveys in 0B have occurred less frequently between 2000 and 2025 (Figure 1.2 bottom panels). There were no surveys in years 2018 and 2020, and biomass estimates from surveys in 2019 on the CV Helga Maria and during 2022-2025 on the RV Tarajoq are not comparable to previous values. Biomass has increased in both Divs. 0A and 0B from 2022 to 2025.

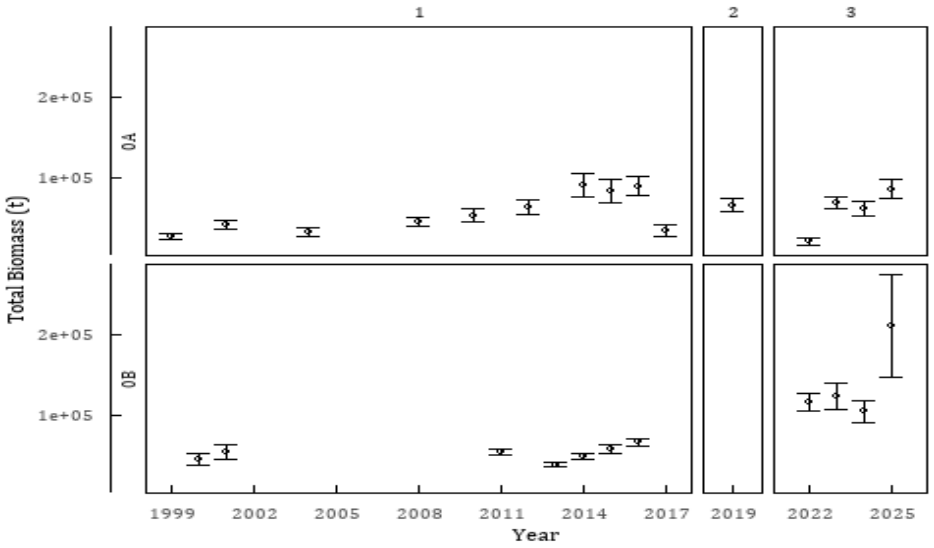


Figure 1.2. Greenland halibut in Subareas 0+1 (offshore): Survey biomass index from the Canadian deep-water survey in SA0. The survey vessel and trawl gear were changed after 2017. Left panels present data collected using the RV Pâmiut; middle panels present data collected using the CV Helga Maria; right panels present data collected using the RV Tarajoq.

Greenland deep-water survey 1CD: Since 1997 Greenland has conducted buffered stratified random bottom trawl surveys during September-November in NAFO Div. 1CD, at 400 to 1500 m depth. Biomass in 1CD fluctuated without trend until 2017 (Figure 1.3). A clearly increasing trend was observed from 2022 to 2025.

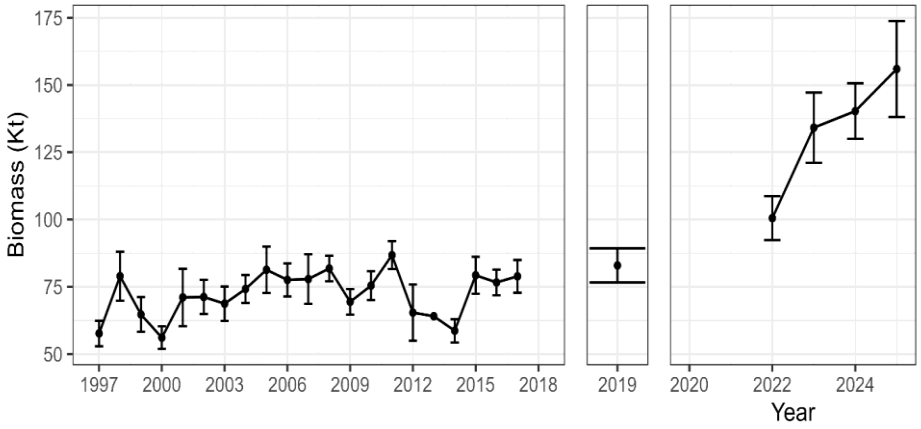


Figure 1.3. Greenland halibut in Subareas 0+1 (offshore): Survey biomass index from the Greenland deep-water survey in 1CD. The survey vessel and trawl gear were changed after 2017. Left panel presents data collected using the RV Pâmiut; middle panels present data collected using the CV Helga Maria; right panels present data collected using the RV Tarajoq.

Greenland shallow-water survey 1AF: The survey has been conducted by Greenland since 1988 targeting shrimp. Since 1991 Greenland halibut have been sampled for biological information (length, weight, etc.) during the survey. A truncated index of biomass of fish > 35 cm fork length from this survey increased from 1991 to a high in 2004, then declined from 2005 until 2008 and has since varied without a clear overall trend (Figure 1.4). In 2005 the survey trawl gear changed from a Skjervoy trawl to a Cosmos trawl. The survey was conducted by different vessels in 2018, 2019, 2020, and 2022-2025, but gear performance analyses concluded the surveys were comparable. The survey was not completed in 2021.

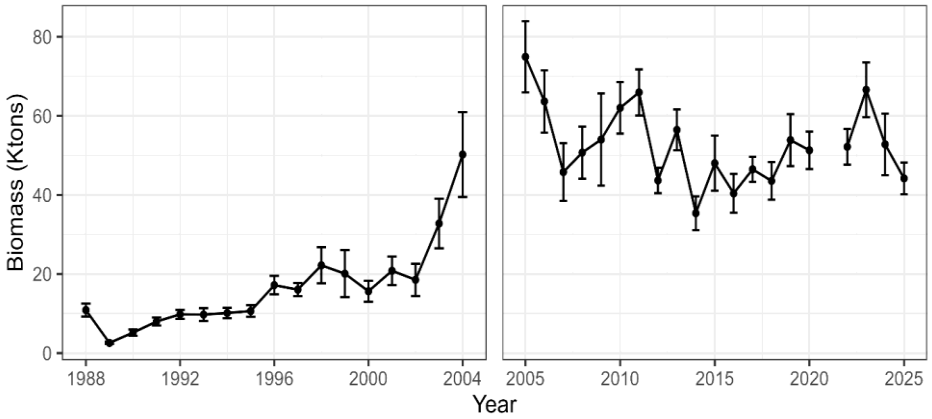


Figure 1.4. Greenland halibut in Subareas 0+1 (offshore): survey index from the Greenland shallow-water survey in 1AF. The survey trawl gear was changed after 2005. Left panel presents data collected using a Skjervoy trawl; right panel presents data collected using a Cosmos trawl.

Age-1 Abundance Index: Greenland halibut caught during the shallow-water survey are assigned to ages 1, 2 and 3+ using length data. The number of 1 year old fish in the survey area is used as an age-1 index to help inform stock status (Figure 1.5). The index generally increased sharply in 2003 from a relatively constant level in 1991-2002, followed by a gradual decline to 2010, after which the index has been more variable with series high values observed in 2011, 2013 and 2017. Age-1 abundance in 2020 was near the series average, and in 2022 to 2024 the index declined slightly. In 2025, the index increased to a value close to the 1991-2002 period. The survey was conducted by different vessels in 2018, 2019, 2020, and 2022-2025, but gear performance analyses concluded the surveys were comparable. The survey was not completed in 2021.

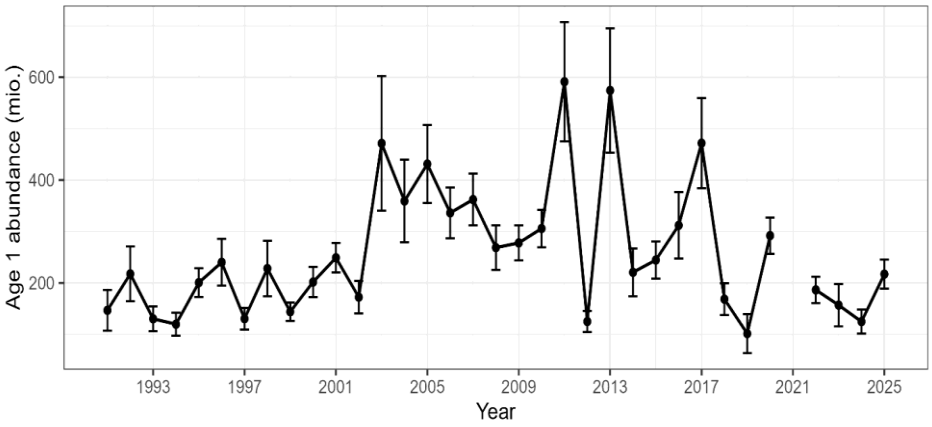


Figure 1.5. Greenland halibut in Subareas 0+1: age-1 abundance index for Subarea 1, derived from the Greenland shallow-water survey in 1AF (including sets in 0A, where available).

c) Conclusion

The most recent analytical assessment (SCR Doc. 25/031) using a stochastic surplus production model in continuous time concluded that the stock was in the Healthy Zone, with projections indicating a high probability of remaining above $B_{trigger}$. Overall, the 2025 survey indices do not suggest a change in the status of the stock.

The next full assessment of this stock is planned for 2027.

2. Greenland halibut (*Reinhardtius hippoglossoides*) Division 1A inshore Divisions 1BC inshore, Division 1D inshore and Divisions 1EF inshore

Full assessment. SCR Docs. 26/013, 014, 015, 016, 017, 018, 019, 024; SCS Doc. 26/11.

a) Introduction

The fishery targeting Greenland halibut in Disko Bay and in the inshore areas in southern West Greenland is conducted with longlines or gillnets from small vessels, open boats, and through holes in the sea ice during the winter months. The fishery gradually spread from Disko Bay to Uummannaq and Upernavik, but catches remained low until the 1980s. Catch limit and quota regulations were introduced in 2008. In 2012, the TAC was split in two components with ITQs for vessels and shared quota for small open boats. To protect juvenile fish in the area, sorting grids have been mandatory since 2002 in the offshore shrimp fishery at West Greenland and since 2011 in the inshore shrimp fishery in Disko Bay. Trawl fishery is not allowed in the Uummannaq fjord and Upernavik area. In 2017, mesh size in gillnets was reduced from 110 mm to 95 mm half mesh.

There are three main areas of the fishery, which are assessed here: Disko Bay, Uummannaq and Upernavik. These inshore areas are believed to depend on recruits from the offshore stock and adults are considered isolated from the stock in Davis Strait and Baffin Bay. Advice is given for each of these three areas on a two-year basis and a separate TAC is set for each of these inshore areas in Division 1A. Inshore stocks south of division 1A were separated from the offshore stock in 2020.

Division 1A inshore – Disko Bay

b) Catch history

Catches increased in the 1980s, peaked from 2004 to 2006 at more than 12 000 t, but then decreased substantially to just above 6 000 t in 2009. From this level, catches gradually increased reaching 10 760 t in 2016. In 2017, catches were unusually low at 6 409 t. Subsequently, catches gradually increased to 11 435 t in 2023 and declined in 2024 and 2025 to 9 644 t and 8 053 t, respectively (Table 2.1.1 and Figure 2.1.1).

Table 2.1.1. Recent catches and TACs ('000 t) of Greenland halibut in Division 1A inshore – Disko Bay.

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
TAC	9.1	9.2	11.1	10.6	10.3	11.4	12.7	10.6	14.3	13.6
Catch[1]	6.4	8.4	8.8	7.6	9.0	10.3	11.4	9.6	8.1	

[1] STACFIS estimate

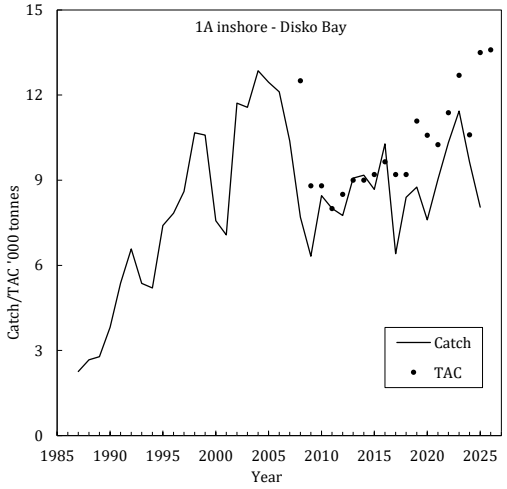


Figure 2.1.1. Greenland halibut in Division 1A inshore Disko Bay: TAC (points) and estimated catches (line).

c) Data overview

i) Commercial fishery data

Mean length in the landings gradually decreased for more than a decade in both the winter and summer longline fishery and in the overall mean length weighted by gear and fishing ground (Figure 2.1.2).

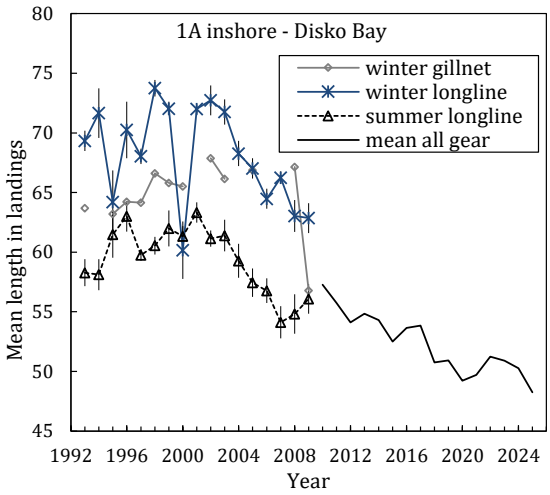


Figure 2.1.2. Greenland halibut in Division 1A inshore Disko Bay: Mean length in landings from longline fishery by season (summer and winter) and overall mean taking account of fishing ground, season and gear.

CPUE indices from the commercial catch

Two commercial CPUE indices are presented for the stock, one based on logbooks and one based on factory landings data. These indices have decreased from 2007 to 2017, increased subsequently until 2022 and decreased since (Figure 2.1.3).

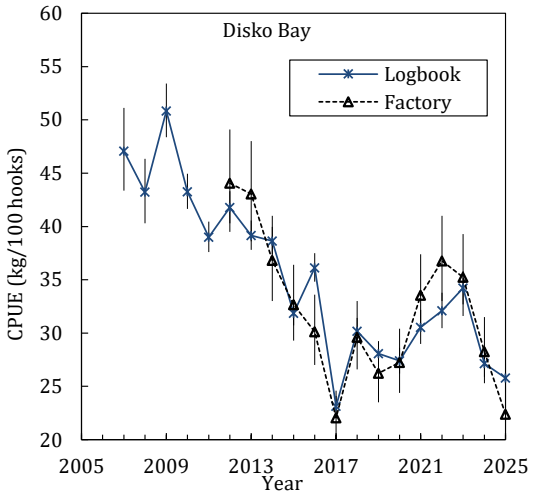


Figure 2.1.3. Greenland halibut in Division 1A inshore Disko Bay: Commercial CPUE from logbooks (vessels) and factory data (vessels, boats and ice fishery) +/- standard error.

In each individual area an ALK based on age readings from the surveys was combined with commercial landings and length frequencies accounting for month and gear, to create a catch-at-age (CAA) bubble plot (Figure 2.1.4). The CAA indicates a gradual shift towards younger fish in the catches. In 2025 the fishery was dominated by ages 5, 6, and 7.

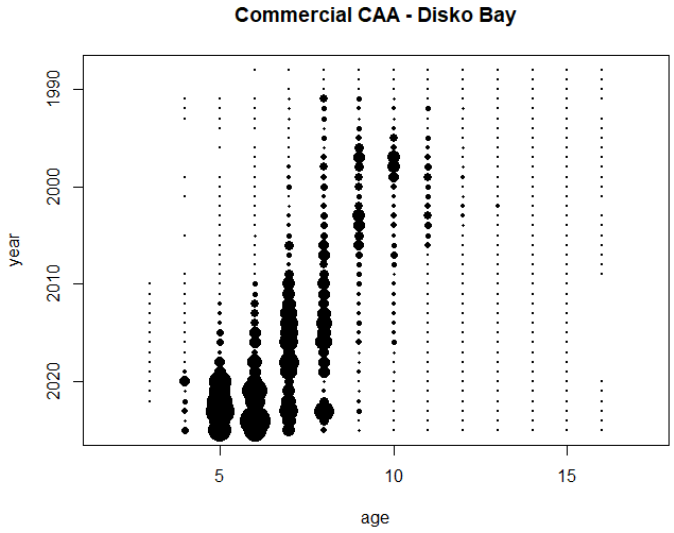


Figure 2.1.4. Greenland halibut in Division 1A inshore Disko Bay: commercial catch-at-age (CAA).

ii) Research survey data

The Disko Bay part of the Greenland Shrimp and Fish Survey (Figure 2.1.5) indicated increasing biomass and abundance trends during the 1990s. After the survey gear change in 2005, biomass and abundance indices gradually decreased and then stabilized after 2014. Abundance fluctuated without clear trends since. Biomass followed a similar pattern, but with a clear decline in 2022-2025.

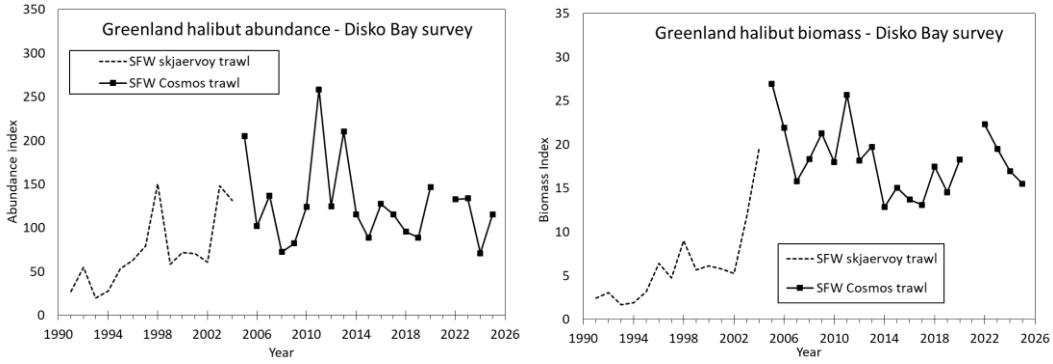


Figure 2.1.5. Greenland halibut in Division 1A inshore Disko Bay: Abundance and biomass indices from the Greenland Shrimp and Fish trawl survey.

The Disko Bay gillnet survey catch in Numbers-Per-Unit-Effort (NPUE) is an index of abundance and the gillnet Catch-Per-Unit-Effort (CPUE) is an index of biomass (Figure 2.1.6). The NPUE increased from 2016 to a maximum in 2021 and strongly decreased in 2022, followed by a fluctuating trend in 2023-2025. The CPUE time series shows a similar trend.

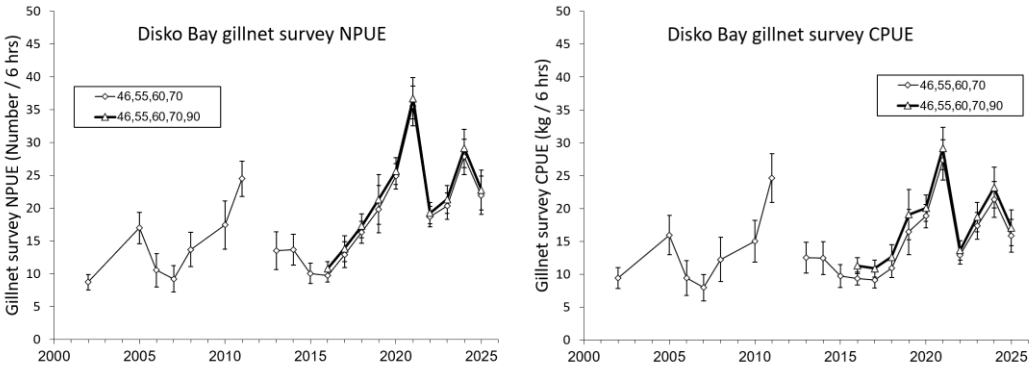


Figure 2.1.6. Greenland halibut in Division 1A inshore Disko Bay: Gillnet survey NPUE and CPUE +/-standard error. The numbers in the legend provide the mesh sizes used in the survey in mm. A 90 mm section was added in 2016.

d) Assessment results

Assessment: No analytical assessment was performed.

Biomass: Although total stock size is not quantified, all indices suggest biomass is declining.

Fishing mortality: Fishing mortality proxies have not been calculated, but mean size of the landed fish has decreased from 57 cm in 2010 to less than 50 cm in 2025, which is suggestive of high fishing pressure.

Recruitment: Unknown.

e) State of the stock

Although total stock size is not quantified, all indices suggest biomass is declining. A Fishing mortality proxy has not been calculated, but mean size of the landed fish has decreased from 57 cm in 2010 to less than 50 cm in 2025, which is suggestive of high fishing pressure. Recruitment is unknown.

f) Reference points

Reference points are undefined.

g) Stock projections

Projections were not possible.

h) Research recommendations

STACFIS **recommends** that *work on surplus production models continues.*

Ongoing. A surplus production in continuous time (SPiCT) model was developed and accepted for the stock in Division 1A inshore Uummannaq. SC reviewed SPiCT models for the stocks in Division 1A inshore Disko Bay and Upernavik, but these were not accepted at this time.

STACFIS **recommends** *investigation of mesh size selectivity on abundance biomass indices in the gillnet survey.*

Ongoing.

The next full assessment of this stock will be in 2028.

Division 1A – Uummannaq

b) Catch history

Catches in the Uummannaq fjord gradually increased from the 1980s reaching 8 425 t in 1999 but then decreased to ~ 5 000 t in 2002. Since 2004, catches gradually increased reaching 10 670 t in 2020. Subsequently, catches decreased, reaching 7 812 t in 2025 (Table 2.2.1 and Figure 2.2.1).

Table 2.2.1. Recent catches and TACs ('000 t) of Greenland halibut in Division 1A inshore – Uummannaq.

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
TAC	9.5	9.5	9.9	9.5	9.6	9.8	9.6	9.7	10.4	9.9
Catch[1]	9.0	8.8	10.2	10.7	9.6	9.0	8.3	8.0	7.8	

[1] STACFIS estimates

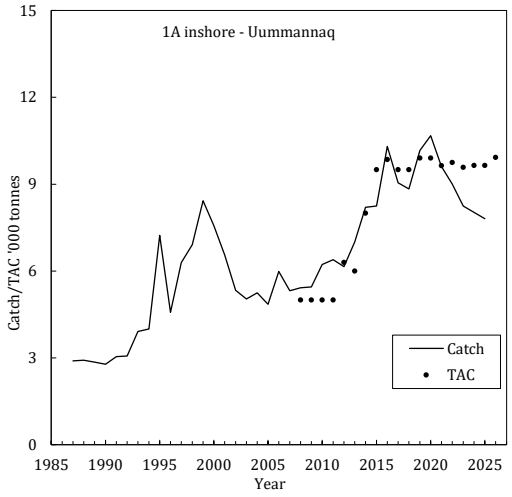


Figure 2.2.1. Greenland halibut in Division 1A inshore Uummannaq: Greenland halibut TAC (points) and estimated catches (line).

c) Data overview

i) Commercial fishery data

In Division 1A Uummannaq, the mean length from commercial landings have gradually decreased since 1993, although a slight upward trend was apparent in 2023-2025 (Figure 2.2.2).

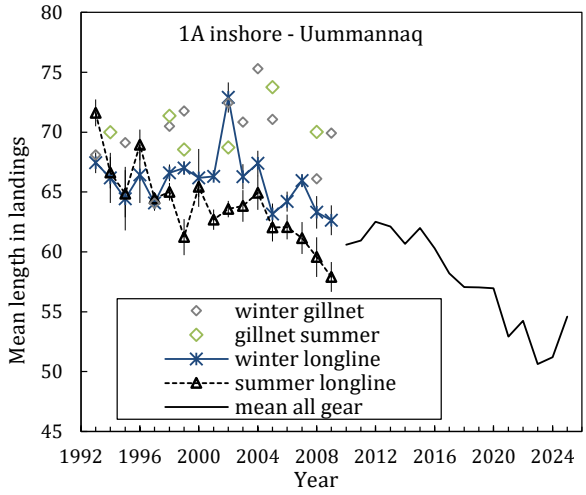


Figure 2.2.2. Greenland halibut in Division 1A inshore Uummannaq: Mean length in landings from longline and gillnet fishery by season and overall mean weighted by gear.

CPUE indices from the commercial catch

Standardized commercial CPUE indices based on logbook data and factory landings data both declined since around 2014, with record low values observed in 2024 and 2025 for the logbook- and factory-based CPUEs, respectively (Figure 2.2.3).

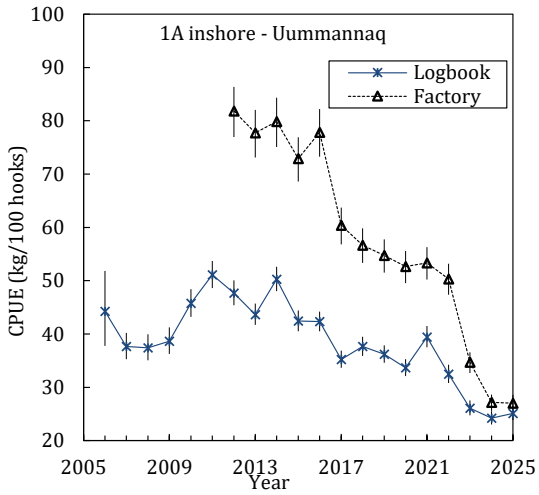


Figure 2.2.3. Greenland halibut in Division 1A inshore Uummannaq: Commercial CPUE from logbooks (vessels) and factory data (vessels, small boats and ice fishery) +/-standard error.

The commercial catch-at-age (CAA) indicates a gradual shift towards younger Greenland halibut in the catches, and the fishery in 2022-2025 was mainly taking fish of ages 5-8 (Figure 2.2.4).

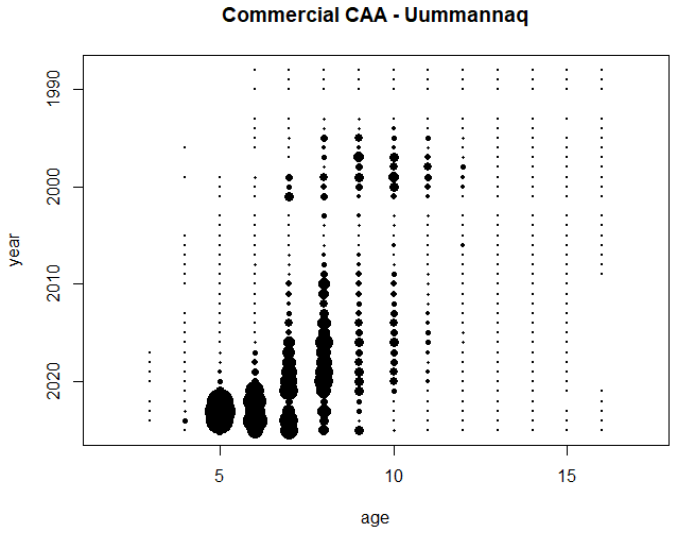


Figure 2.2.4. Greenland halibut in Division 1A inshore Uummannaq: commercial catch-at-age (CAA).

ii) Research survey data

The Uummannaq gillnet survey indices declined from 2015-2018, increased until 2021 and have declined since (Figure 2.2.5).

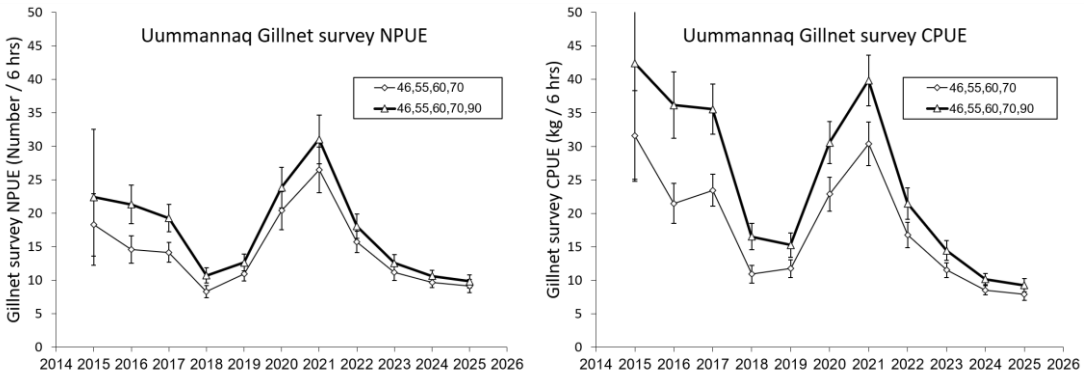


Figure 2.2.5. Greenland halibut in Division 1A inshore Uummannaq: Gillnet survey NPUE and CPUE +/- standard error. The numbers in the legend provide the mesh sizes used in the survey in mm. A 90 mm section has been added in 2016.

d) Assessment results

Assessment: During the 2026 SC June meeting a stochastic surplus production model in continuous time (SPiCT) was presented and accepted as a valid assessment tool for this stock. The SPiCT model used catches from 1977 to 2025, the gillnet survey index from 2015 to 2025, the commercial CPUE indices from logbook-data from 2006 to 2025, and the commercial CPUE indices from factory-data from 2012 to 2025 as inputs. Estimated parameters and relative reference points from the model are listed in Table 2.4.1.

Table 2.2.2. Estimated parameters and relative reference points of a surplus production model in continuous time for Greenland halibut in Division 1A inshore – Uummannaq.

Parameter	Estimate	CI lower	CI upper	Log.est
alpha2 (α = SDIndex/SDBiomass)	0.85	0.22	3.31	-0.17
Beta (β = SDCatch/SDF)	1.05	0.50	2.17	0.04
r (intrinsic growth rate)	0.26	0.17	0.40	-1.34
m (deterministic MSY)	6,701	5,208	8,621	8.81
K (Carrying capacity)	102,144	66,416	157,093	11.53
q1 (Catchability for survey)	0.0005	0.0002	0.0009	-7.68
q2 (Catchability for logbook CPUE)	0.0007	0.0004	0.0014	-7.24
q3 (Catchability for factory CPUE)	0.0011	0.0006	0.0020	-6.82
sdb (Standard deviation biomass)	0.08	0.04	0.16	-2.49
sdf (Standard deviation fishing mortality)	0.14	0.08	0.25	-1.95
sdi1 (Standard deviation survey)	0.35	0.23	0.54	-1.05
sdi2 (Standard deviation logbook CPUE)	0.07	0.03	0.17	-2.66
sdi3 (Standard deviation factory CPUE)	0.13	0.08	0.23	-2.02
sdc (Standard deviation catch)	0.15	0.11	0.21	-1.91
B (Biomass 2025)	30,671	14,006	67,164	10
F (Fishing mortality 2025)	0.24	0.11	0.51	-1.42
B/Bmsy (relative biomass 2025)	0.61	0.32	1.18	-0.49
F/Fmsy (relative fishing mortality 2025)	1.87	0.96	3.65	0.63

Biomass: Biomass increased to above B_{msy} between 1995 and 2019 but declined to below $B_{trigger}$ in 2023 (Figure 2.2.6). In 2025, the median estimate of biomass is below $B_{trigger}$ but above B_{lim} with a 98% probability.

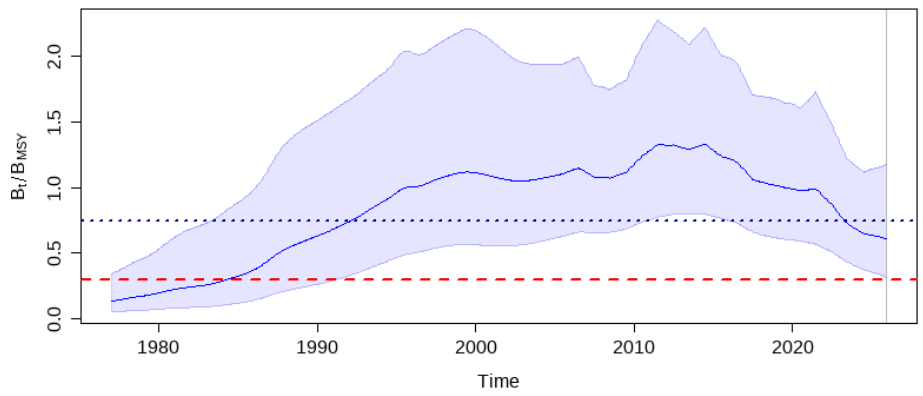


Figure 2.2.6. Greenland halibut in Division 1A inshore Uummannaq: estimated relative biomass B/B_{msy} (blue line) with 95 % confidence interval (blue shaded area). The dotted line is $B_{trigger}$ = 0.75 B_{msy} and the red dashed line is B_{lim} = 0.3 B_{msy}.

Fishing mortality: Fishing mortality was generally below F_{lim} = F_{msy} until 2015 and has been above F_{lim} since (Figure 2.2.7). In 2025, the median estimate of fishing mortality is 1.9 times F_{lim}.

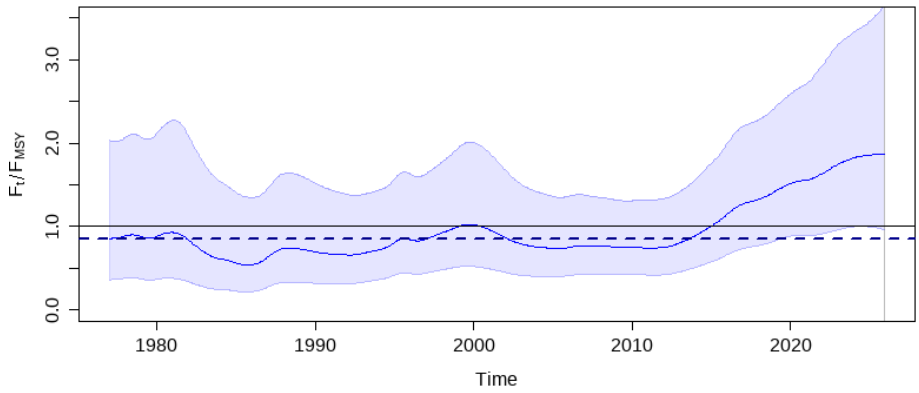


Figure 2.2.7. Greenland halibut in Division 1A inshore Uummannaq: estimated relative fishing mortality F/F_{msy} (blue line) with 95 % confidence interval (blue shaded area). The solid line is $F_{lim} = F_{msy}$ and the dashed line is F_{target}.

Recruitment: Unknown.

e) State of the stock

The stock is in the Cautious Zone of the NAFO PA Framework. In 2025, the median estimate of biomass is below $B_{trigger}$ but above B_{lim} with a 98% probability and the median estimate of fishing mortality is 1.9 times F_{lim}. Recruitment is unknown.

f) Reference points

Reference points are defined according to the revised NAFO PA Framework. B_{lim} is defined at 0.3 B_{msy}, $B_{trigger}$ is defined at 0.75 B_{msy}, F_{lim} is defined at F_{msy}, and F_{target} is defined at 0.85 F_{msy}. The Division 1A inshore Uummannaq stock is currently in the Cautious Zone of the NAFO PA Framework, with a 1.9 % probability of being below B_{lim} and 97 % probability of being above F_{lim} (Figure 2.2.8).

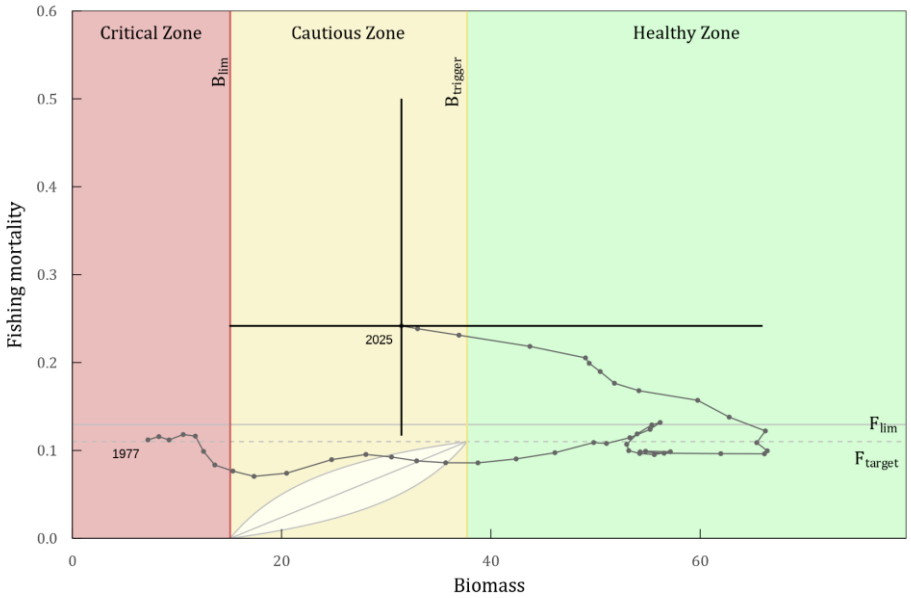


Figure 2.2.8. Greenland halibut in Division 1A inshore Uummannaq: Stock trajectory estimated from the SPiCT model under the NAFO Precautionary Approach Framework (80% confidence intervals on the 2025 estimate).

g) Stock projections

Medium-term projections were carried forward for catch scenarios with catch = TAC = 9 922 t for 2026. Constant *F* was applied from 2027-2028 at several levels of *F*, i.e. *F* = 0 and the NAFO PA Leaf (lower edge, midrib and upper edge for 2027) for stocks in the Cautious Zone (Table 2.2.3, Table 2.2.4, Figure 2.2.9).

During the projection period (2027-beginning 2029), there is a 50 to 79 % annual probability that the stock remains below $B_{trigger}$, and <1% to 3 % annual probability that the stock will be below B_{lim} for the projected scenarios (excluding *F* = 0). The annual probability of exceeding F_{lim} in 2027-2028 is lower than 16 % for the projected scenarios (excluding *F* = 0). Projections show a 72 to 90 % probability that the stock will increase from 2026 to 2029 for the projected scenarios (excluding *F* = 0).

Table 2.2.3. Medium-term projections for Greenland halibut in Division 1A inshore – Uummannaq. Estimates for projected yield (t) and relative biomass (B/B_{msy}) with 80% confidence interval are shown for *F* = 0 and the NAFO PA Leaf (lower, midrib and upper for 2027) for stocks in the Cautious Zone. Catch in 2026 is assumed as 9 922 t (TAC).

Catch 2026 = 9 922 t (TAC)			
Year	F	Yield (t) Median	Projected Relative Biomass (B/B_{msy}) Median (80% CI)
F = 0			
2026	0.27	9 922	0.62 (0.43, 0.89)
2027	0.00	0	0.57 (0.36, 0.89)
2028	0.00	0	0.68 (0.44, 1.05)
2029	-	-	0.80 (0.53, 1.21)
F lower edge leaf in 2027			
2026	0.27	9 922	0.62 (0.43, 0.89)
2027	0.04	1 141	0.57 (0.36, 0.89)

2028	0.04	1 309	0.66 (0.42, 1.02)
2029	-	-	0.75 (0.49, 1.16)
F midrib leaf in 2027			
2026	0.27	9 922	0.62 (0.43, 0.89)
2027	0.07	2 015	0.57 (0.36, 0.89)
2028	0.07	2 250	0.64 (0.41, 1.00)
2029	-	-	0.71 (0.45, 1.12)
F upper edge leaf in 2027			
2026	0.27	9 922	0.62 (0.43, 0.89)
2027	0.09	2 707	0.57 (0.36, 0.89)
2028	0.09	2 956	0.62 (0.39, 0.99)
2029	-	-	0.68 (0.43, 1.09)

Table 2.2.4. Medium-term projections for Greenland halibut in Division 1A inshore – Uummannaq. Estimates for projected yield (t) and risk (%) of $F>F_{lim}$, $B<B_{lim}$, $F>F_{target}$ and $B<B_{trigger}$ are shown for F=0 and the NAFO PA Leaf (lower, midrib and upper for 2027) for stocks in the Cautious Zone. Catch in 2026 is assumed as 9 922 t (TAC).

		Catch 2026 = 9 922 t (TAC)			
Cautious Zone		*F* = 0	*F* lower edge leaf in 2027	*F* midrib leaf in 2027	*F* upper edge leaf in 2027
Yield (t) Median	2026	9 922	9 922	9 922	9 922
	2027	0	1 141	2 015	2 707
	2028	0	1 309	2 250	2 956
$P(F>F_{lim})$	2026	99 %	99 %	99 %	99 %
	2027	<1 %	<1 %	2 %	14 %
	2028	<1 %	<1 %	3 %	16 %
$P(B<B_{lim})$	2026	<1 %	<1 %	<1 %	<1 %
	2027	3 %	3 %	3 %	3 %
	2028	<1 %	1 %	2 %	2 %
	2029	<1 %	<1 %	<1 %	1 %
$P(F>F_{target})$	2026	> 99 %	> 99 %	> 99 %	> 99 %
	2027	<1 %	<1 %	7 %	28 %
	2028	<1 %	<1 %	8 %	29 %
$P(B<B_{trigger})$	2026	75 %	75 %	75 %	75 %
	2027	79 %	79 %	79 %	79 %
	2028	61 %	65 %	68 %	70 %
	2029	42 %	50 %	56 %	61 %
$P(B_{2029}>B_{2026})$		96 %	90 %	82 %	72 %
$(B_{2029}-B_{2026})/B_{2026}$		30 %	22 %	15 %	10 %

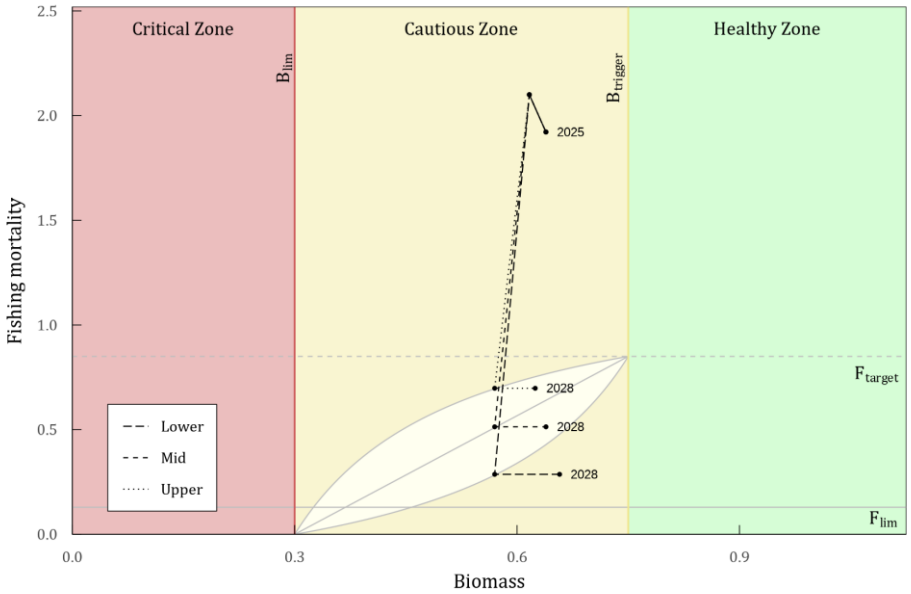


Figure 2.2.9. Greenland halibut in Division 1A inshore Uummannaq: Stochastic projections in the NAFO PA Framework from 2026-2028 with assumed 2026 catch = TAC = 9 922 t.

h) Research recommendations

STACFIS **recommends** *investigation of mesh size selectivity on abundance biomass indices in the gillnet survey. Ongoing.*

The next full assessment of this stock will be in 2028.

Division 1A – Upernavik

b) Catch history

Catches increased from the mid-1980s and peaked in 1998 at a level of 7 000 t. Landings then decreased sharply, but gradually increased to a level between 7 500 and 9 000 t until 2019 and subsequently decreased to 4 329 t in 2025 (Table 2.3.1 and Figure 2.3.1).

Table 2.3.1. Recent catches and TACs ('000 t) of Greenland halibut in Division 1A inshore – Upernavik.

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
TAC	9.7	9.5	8.5	8.5	9.9	10.0	9.5	9.3	11.0	10.5
Catch[1]	6.8	7.5	9.0	7.6	8.5	7.7	7.3	5.4	4.3	

[1] STACFIS estimates

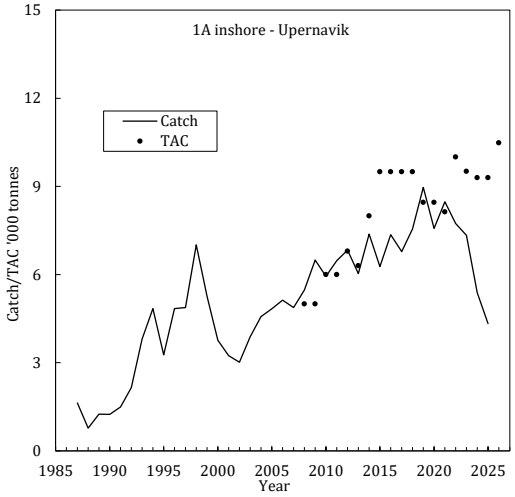


Figure 2.3.1. Greenland halibut in Division 1A inshore Upernavik: TAC (points) and estimated catches (line).

c) Data overview

i) Commercial fishery data

The mean length in the commercial landings decreased from 1993 to 1998. From 1999 to 2009, the mean length in the longline fishery remained constant, but has since decreased further (Figure 2.3.2).

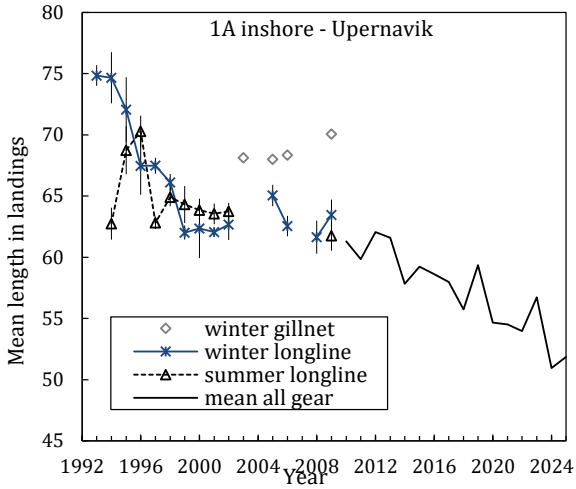


Figure 2.3.2. Greenland halibut in Division 1A inshore Upernavik: mean length in landings from longline fishery by season (summer and winter) and after 2010 overall mean taking account of fishing ground, season and gear.

CPUE indices from the commercial catch

CPUE based on logbooks gradually decreased from 2006. The CPUE based on factory landings data shows a similar trend since 2012 (Figure 2.3.3).

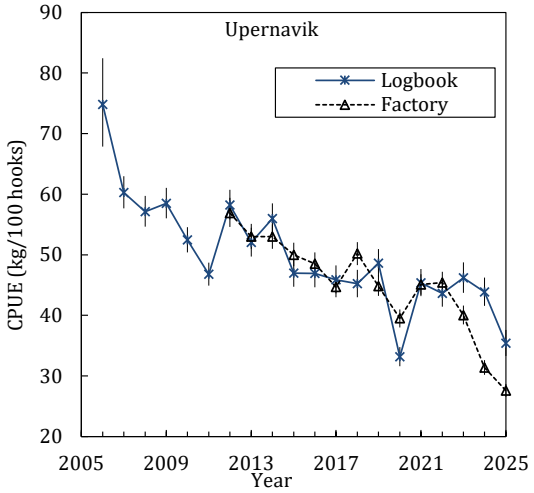


Figure 2.3.3. Greenland halibut in Division 1A inshore Upernavik: Commercial CPUE from logbooks (vessels) and factory data (vessels, small boats and ice fishery) +/- standard error.

The catch-at-age (CAA) indicates a gradual shift towards younger Greenland halibut in the catches (Figure 2.3.4).

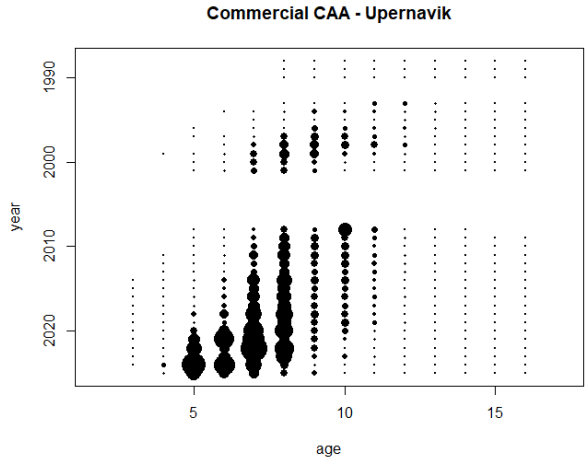


Figure 2.3.4. Greenland halibut in Division 1A inshore Upernavik: commercial catch-at-age (CAA).

ii) Research survey data

The Upernavik gillnet survey NPUE and CPUE increased in 2020 but has gradually decreased since then (Figure 2.3.5).

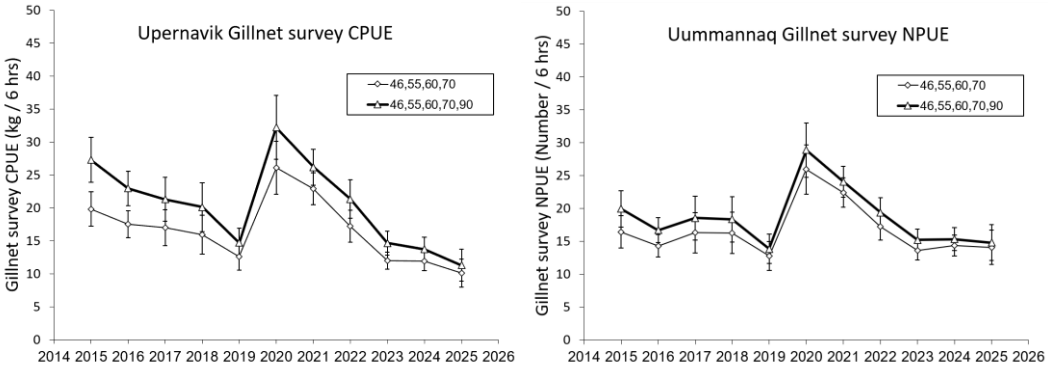


Figure 2.3.5. Greenland halibut in Division 1A inshore Upernavik: gillnet survey NPUE (left) and CPUE (right) +/-standard error. The numbers in the legend provide the mesh sizes used in the survey in mm. A 90 mm section has been added in 2016.

d) Assessment results

Assessment: No analytical assessment was performed.

Biomass: Although total stock size is not quantified, all indices suggest biomass is declining.

Fishing mortality: Fishing mortality proxies have not been calculated, but mean size of the landed fish has decreased from 62 cm in 2013 to 52 cm in 2025, which is suggestive of high fishing pressure.

Recruitment: Unknown.

e) State of the stock

Although total stock size is not quantified, all indices suggest biomass is declining. Fishing mortality proxy has not been calculated, but mean size of the landed fish has decreased from 62 cm in 2013 to 52 cm in 2025, which is suggestive of high fishing pressure. Recruitment is unknown.

f) Reference points

Reference points are undefined.

g) Stock projections

Projections were not possible.

h) Research recommendations

STACFIS **recommends** that *work on surplus production models continues.*

Ongoing. A surplus production in continuous time (SPiCT) model was developed and accepted for the stock in Division 1A inshore Uummannaq. SC reviewed SPiCT models for the stocks in Division 1A inshore Disko Bay and Upernavik, but these were not accepted at this time.

STACFIS **recommends** *investigation of mesh size selectivity on abundance biomass indices in the gillnet survey.*

Ongoing.

The next full assessment of this stock will be in 2028.

3. Demersal redfish and deep-sea redfish (*Sebastes* spp.) in Subarea 1

Full assessment. SCR Docs. 20/052, 26/011, 012, 013, 22; SCS Doc. 26/11.

a) Introduction

There are two demersal redfish species of commercial importance in NAFO Subarea 1, golden redfish (*Sebastes norvegicus*) and demersal deep-sea redfish (*Sebastes mentella*). Connectivity to other redfish stocks off East Greenland, the Irminger Sea, the Newfoundland and Labrador Shelves, and Iceland is unclear.

b) Fisheries and Catches

Both redfish species (*S. norvegicus* and *S. mentella*) are included as redfish in the catch statistics. The fishery targeting demersal redfish in SA1 increased during the 1950s and peaked in 1962 at more than 60 000 t. Catches then decreased and have remained below 1 000 t per year after 1986 with few exceptions. Recent catches of redfish in Subarea 1 are a mixture of bycatches in shrimp and other fisheries (Figure 3.1).

Recent catches (t) are as follows:

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
TAC	1000	1000	0	0	0	0	0	0	0	0
Catches[1]	222	194	142	194	256	291	325	284	211	

[1] STACFIS estimates

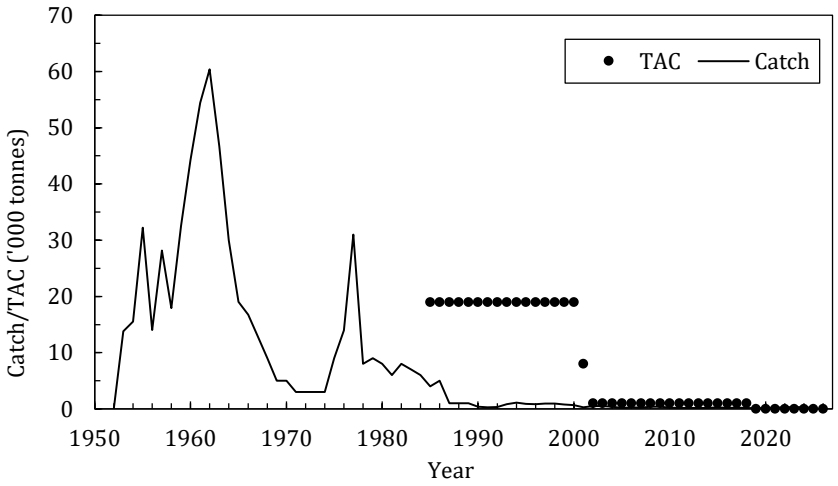


Figure 3.1. Demersal redfish in Subarea 1: TACs and estimated catches for golden redfish and demersal deep-sea redfish combined.

c) Data overview

i) Research survey data

There are several surveys considered for the assessment of redfish in west Greenland, but only the Greenland shrimp and fish survey (Greenland SFW) covers the northern distribution range (1A-1F, 0-600m since 1992). Other surveys considered are the EU-Germany survey (1C-1F, 0-400m since 1982), the Greenland deep survey (1CD, 400-1500m, since 1997), the historic Greenland-Japan survey (1BCD, 400-1500m,1987-1995) and the Greenland shrimp and fish inshore trawl survey (1D, 0-700m, since 2015).

d) Results

i) Golden redfish (Sebastes norvegicus)

The EU-Germany survey biomass index decreased from a high level in the 1980's. The EU-Germany and Greenland SFW surveys were at very low levels from 1990 to 2005 but increased gradually from 2005 to 2015 (Figure 3.2). The Greenland SFW survey has been relatively stable over 2022-2025, following higher levels in 2016 and 2019. The biomass indices remain far below the level in the early 1980's and the early indices were obtained after the large fishery in the 1960s.

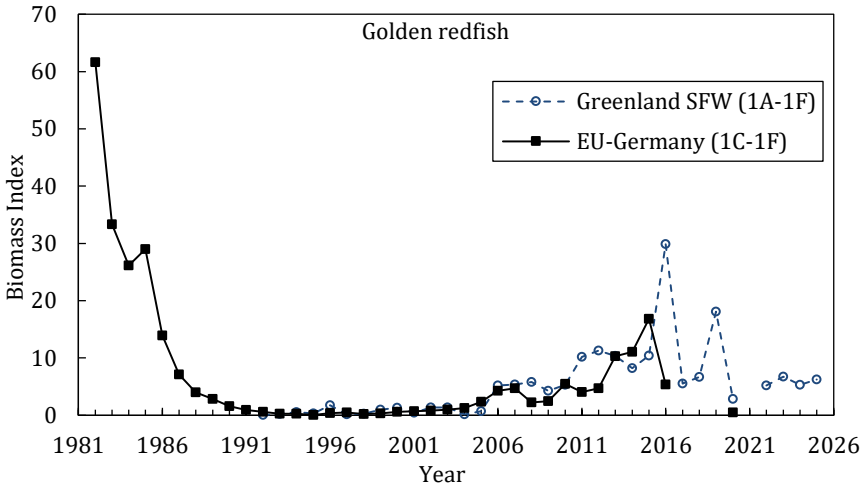


Figure 3.2. Golden redfish biomass indices in the EU-Germany survey and the Greenland SFW survey (no surveys in 2021).

ii) Demersal deep-sea redfish (Sebastes mentella)

The Greenland deep survey and the Greenland SFW survey both indicate that the biomass remained low until 2007, with an increasing trend until the early- to mid-2010s (Figure 3.3). Both indices have fluctuated at a higher level since then, with peaks in 2016 (Greenland SFW) and 2023 (Greenland deep).

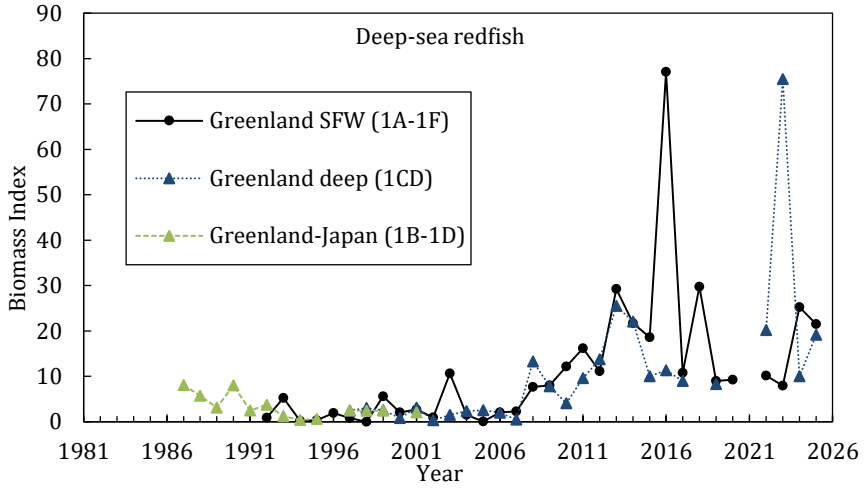


Figure 3.3. Demersal deep-sea redfish survey biomass from the Greenland SFW survey, the Greenland deep survey and the Greenland-Japan survey.

iii) Juvenile redfish (<17cm, both species combined)

The EU-Germany juvenile abundance index fluctuated without a trend between 1986 and 2000 and decreased to very low levels until the most recent survey updates in 2016. The Greenland SFW juvenile abundance index generally declined from the early- to mid-1990s reaching very low levels in the 2010s. From 2020 this index displays values similar to the 1990s (Figure 3.4). Survey length frequencies show that the juvenile abundance indices comprise several year classes. The trends in the EU-Germany and the Greenland SFW surveys are in good agreement, although the Greenland SFW survey is substantially higher in scale, likely related to the differences in survey area.

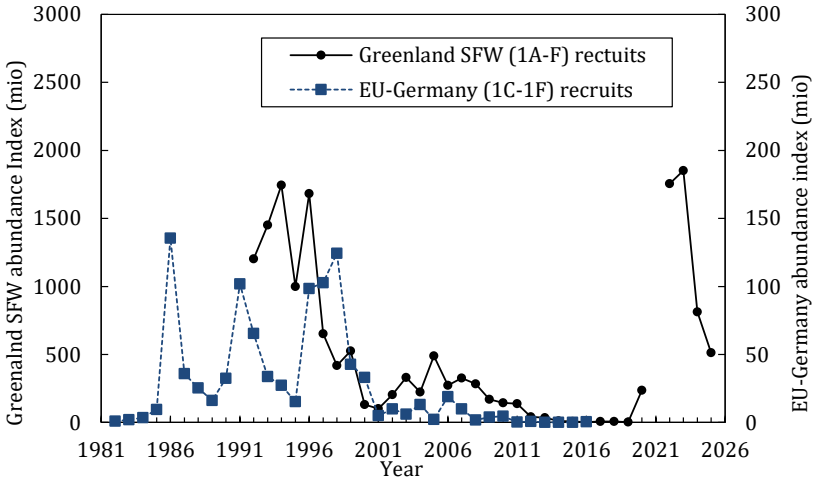


Figure 3.4. Juvenile redfish abundance indices (<17cm, both species combined) for the EU-Germany and Greenland SFW surveys.

e) Assessment results

No analytical assessment was performed for either stock.

Biomass:

> <u>*Golden redfish*</u>*:* Survey results indicate decreasing biomass of golden redfish from the 1980s to very low levels for two decades and slowly increasing since then. However, the biomass index remains far below historical levels.
>
> <u>*Deep sea redfish*</u>*:* Deep-sea redfish biomass was at low levels from 1987 in the surveys but gradually increased from 2008, but without evidence of further increases during the last decade.

Fishing mortality: fishing mortality proxies have not been calculated.

Recruitment: Survey juvenile abundance indices for golden redfish and deep sea redfish (combined) indicate higher levels of recruitment in the 1980s and 1990s, but far lower numbers during the 2000s, and an almost complete lack of recruits during the 2010s. However, the Greenland SFW survey indicates several larger year classes since 2020, at levels similar to the 1990s.

f) State of the stock

The biomass of golden redfish and deep sea redfish remain below historical levels with few signs of recent recruitment. Fishing mortality is unknown.

g) Reference points

Could not be established.

h) Research recommendations

SC **recommends** that *species composition and length-frequency distribution data from the Greenland shrimp and fish survey should be re-analysed to inform on recruitment for this stock.*

Completed. The entire survey timeseries in the Greenland shrimp and fish survey was recalculated in 2026 and an updated recruitment index was presented.

These stocks will next be assessed in 2029.

4. Wolffish in Subarea 1

Full assessment. SCR Docs. 20/052, 26/011; SCS Doc. 26/11.

a) Introduction

Three species of wolffish are common in Greenland. Only Atlantic wolffish (*Anarhichas lupus*) and spotted wolffish (*Anarhichas minor*) are of commercial interest. Atlantic wolffish has a more southern distribution and seems more connected to the offshore banks and the coastal areas. Spotted wolffish can be found further north in West Greenland than Atlantic wolffish both in the fjords and offshore.

b) Fisheries and Catches

Wolffish are primarily taken as a bycatch in other fisheries. There is no information about the species split of the catches. The commercial fishery for wolffish in West Greenland occurred from the 1950s to 1979 with catches of around 5 000 t per year (Figure 4.1). After 1980, the cod fishery gradually stopped in West Greenland and catches of wolffish also decreased during this period. To minimize by-catch in the shrimp fishery, offshore trawlers targeting shrimp have been equipped with 22 mm grid separators since 2002 and inshore (Disko Bay) trawlers since 2011. Since 2015, reported catches have been at a lower level. A separate TAC is set for each species by the Government of Greenland.

Recent nominal catches of wolffish (t) and TAC.

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
wolffish TAC	2025	1025	0	0	0	0	1000	1000	775	775
Catch[1]	238	260	186	251	243	175	197	195	338	

[1] STACFIS estimates

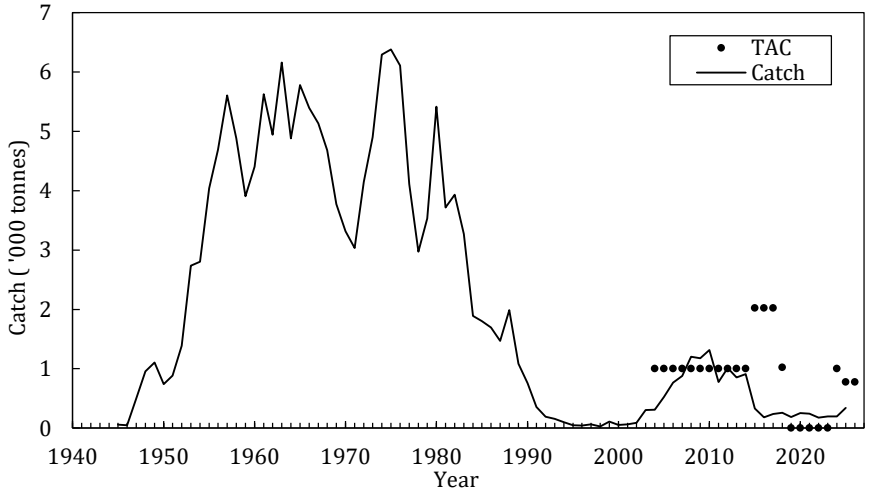


Figure 4.1. Wolffish in NAFO Subarea 1: TACs and estimated catches for Atlantic wolffish and spotted wolffish combined.

c) Data overview

i) Research survey data

Indices for Atlantic wolffish and spotted wolffish are derived from the EU-Germany survey and the Greenland shrimp and fish survey (Greenland SFW). The EU-Germany survey started in 1982 and covers the shelf off East Greenland (ICES subarea 14) and the southern part of West Greenland (1C-F, depth 0-400m). The EU-Germany survey has had decreasing coverage in the later part of the timeseries and, except for a few stations in 2020, has not been updated since 2015. The Greenland SFW survey was fully implemented in 1992 and covers the Shelf at West Greenland from 72N to South Greenland (NAFO 1A-1F, depth 0-600m).

Atlantic wolffish:

The EU-Germany biomass index decreased from 1982 to 1990 and remained at low levels until 2015 (Figure 4.2, left). The EU-Germany abundance index decreased from 1982 to 1984 but remained stable until 2005. From to 2005 to 2015 the abundance index gradually decreased further (Figure 4.2, right). The Greenland SFW survey biomass index slowly increased both before and after the gear change in 2005 (Figure 4.2, left). The Greenland SFW abundance index has gradually increased throughout the time series, although decreasing over 2022-2025 (Figure 4.2, right). The increasing abundance and biomass in the Greenland SFW survey are partly observed in divisions 1A-B, outside the EU-Germany survey area, for which there was the lowest value in 2020 for the EU-Germany time-series (both indices).

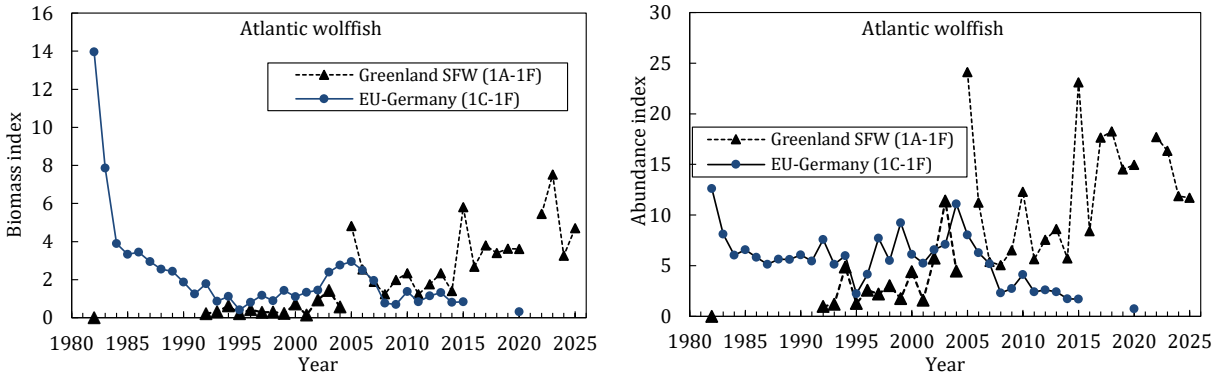


Figure 4.2. Atlantic wolffish survey biomass index (left) and abundance index (right).

Spotted wolffish:

The EU-Germany survey biomass index gradually decreased from 1982 to 1991 and remained at low levels during the 1990s (Figure 4.3, left). From 2004, the EU-Germany survey biomass increased, and recent indices in 2013 to 2015 and 2020, were at the level observed at the beginning of the 1980s. The Greenland SFW survey biomass index was at low levels during the 1990s but generally increased after 2002 (Figure 4.3, left). The Greenland SFW survey abundance gradually increased from 1992 to 2018 but has been decreasing since then (Figure 4.3, right).

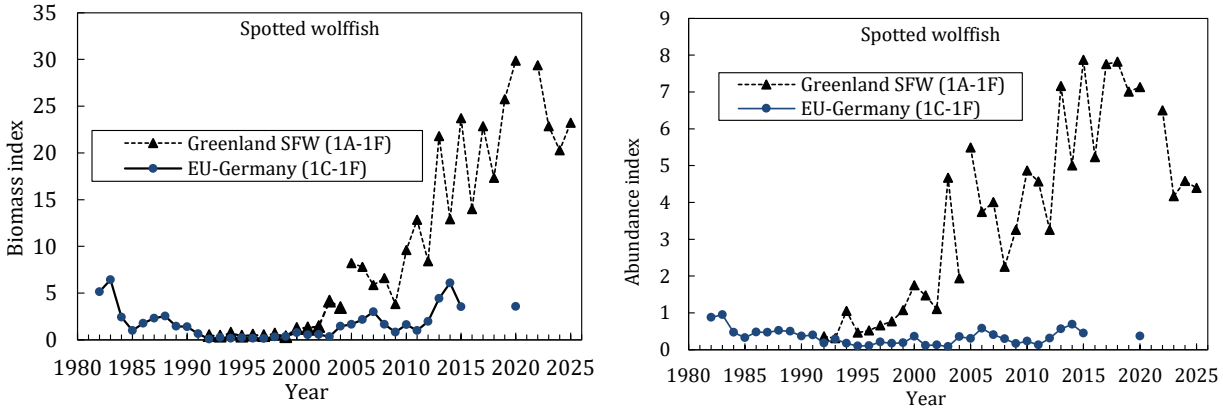


Figure 4.3. Spotted wolffish survey biomass indices (left) and abundance indices (right).

d) Assessment results

No analytical assessment was performed for either stock.

i) Atlantic wolffish

Biomass: The biomass index of the EU-Germany survey in 2015 was much lower than at the start of the time series. The survey biomass and abundance indices have slowly increased in the Greenland SFW survey.

Fishing mortality: Unknown

Recruitment: Unknown.

ii) Spotted wolffish

Biomass: Although the EU-Germany survey has had poor coverage in West Greenland since 2015, the most recent updated biomass indices (2013 - 2015 and 2020) were close to the indices observed at the beginning of the 1980's. The survey biomass and abundance indices in the Greenland SFW survey have generally been decreasing since 2020.

Fishing mortality: Unknown.

Recruitment: Unknown.

e) State of the stock

i) Atlantic wolffish

The biomass remains below the higher level of the 1980s. Recruitment and fishing mortality are unknown.

ii) Spotted wolffish

Although the biomass and abundance indices have been increasing in the recent two decades, the indices have decreased since the most recent assessment in 2023. Recruitment and fishing mortality are unknown.

f) Reference points

Could not be established.

g) Research recommendations

SC **recommends** *investigation of fishing mortality and recruitment proxies.*

These stocks will next be assessed in 2029.

STOCKS ON THE FLEMISH CAP (NAFO DIVISION 3M)

Environmental Overview

The STACFEN Committee did not meet during the 2026 SC June meeting. Therefore, no environmental overviews, including the update of environmental conditions for 2025, were available to SC. The lack of this information increases the uncertainty of all stock assessments, as any potentially relevant environmental connections would have gone undetected.

5. Golden redfish (*Sebastes norvegicus*) in Division 3M

Interim Monitoring Report. SCR Doc. 26/003; SCS Docs. 26/05, 06, 09, 10.

a) Introduction

There are three species of redfish that are commercially fished on the Flemish Cap: deep-sea redfish (*Sebastes mentella*), golden redfish (*Sebastes norvegicus*) and Acadian redfish (*Sebastes fasciatus*). The term beaked redfish refers to *S. mentella* and *S. fasciatus* combined. Due to difficulties with identification and separation, all three species are reported together as 'redfish' in the commercial fishery. All species have both pelagic and demersal concentrations. Redfish species are long lived with slow growth.

The separation of the three species is conducted in the EU research survey. This requires extensive sampling efforts by trained experts to examine internal features of individual redfish. The percentage per depth range of the three species in the EU Flemish Cap surveys is used to separate the reported (reported together as redfish) Div. 3M commercial catches into golden and beaked redfish. This method is also applied in assessments of beaked redfish.

It was not possible to have the catch separated by species in 2025. The proportion of golden redfish in the total catch of redfish for 2024 was applied to the total catch in 2025 to provide an estimate of the catches of golden redfish for 2025, but this catch is provisional and subject to changes.

b) Fisheries and Catches

Catches of golden redfish in Division 3M increased from 1 158 t in 2006 to a peak of 7 662 t in 2009. In 2010, catches decreased and remained relatively stable until 2014 between 2 000 and 3 000 t. After 2014, catches decreased continuously to low levels over 2016 to 2024. For the reason explained above, no reliable catch for 2025 is available at this stage. EU-Portugal, EU-Spain, the Russian Federation and EU-Estonia are responsible for the majority of the redfish landings.

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

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
TAC[1]	7.0	10.5	10.5	8.6	8.4	10.9	11.2	17.5	17.5	15.6
Total redfish catch[1,2]	7.1	10.5	10.5	8.8	8.3	10.0	9.7	9.5	10.4	
Golden redfish catch[3]	0.3	0.1	0.3	0.1	0.1	0.6	0.3	0.2	0.2[4]	

[1] TAC and Total redfish catch refer to all three redfish species combined.
[2] CESAG estimates
[3] Golden redfish catch estimate, based on golden redfish proportions in observed catches.
[4] Provisional. Estimated golden redfish catch based on golden redfish proportions in observed catch in 2024.

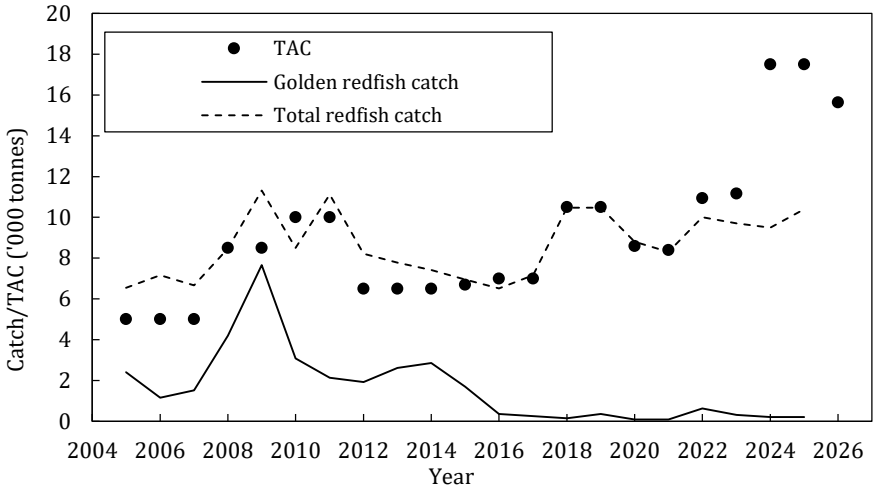


Figure 5.1. Golden redfish in Div. 3M: combined TACs and estimated catches for all three redfish species, and estimated catches for golden redfish.

c) Data overview

i) Research surveys

The 1988-2025 EU survey biomass and abundance indices for golden redfish are presented in Figure 5.2. Both indices were at higher levels during 2004 to 2008 compared to the remainder of their respective time series, which cannot be explained by recruitment alone. Apart from this period, the remainder of the time series (both before and after the high period) show fluctuations at a lower level, with the abundance index showing lower variation after the high period compared to before. In the context of the entire period, both indices remain low in 2025. Survey results are noisy, typical of redfish indices, but broad trends remain evident.

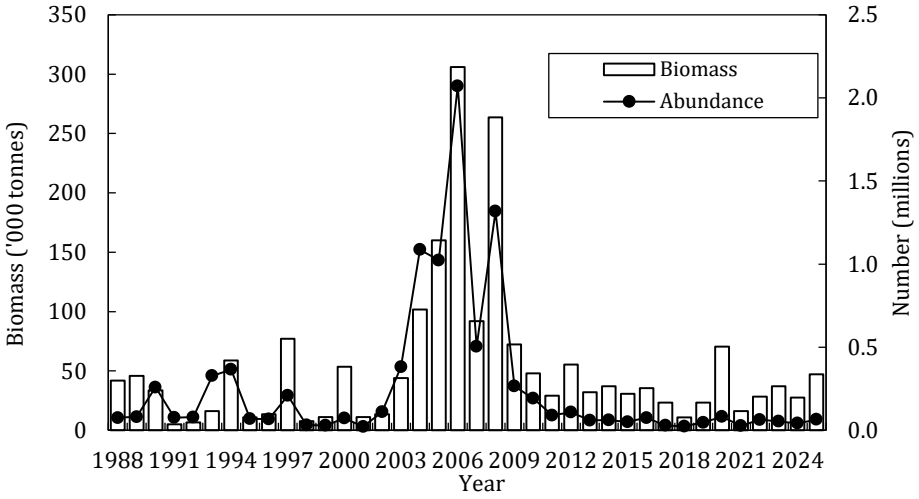


Figure 5.2. Golden redfish in Div. 3M: EU biomass and abundance indices, 1988-2025.

d) Conclusions

The perception of the stock status has not changed.

Given the current state of the stock, it was not considered appropriate to apply any assessment model or to give advice for golden redfish separately. Nevertheless, as in previous years, advice is provided for all three redfish stocks combined, and this is based on the assessment for Div. 3M beaked redfish with an adjustment by a percentage to account for golden redfish. This percentage is calculated as the average of the percentages of golden redfish found in the total redfish catches of the last 3 years. Scientific Council will continue to monitor the golden redfish stock status and provide advice as part of the beaked redfish advice.

The next assessment of the stock is planned when the dynamic of the stock changes.

6. Cod (*Gadus morhua*) in Division 3M

Full assessment. SCS Docs. 26/05, 06, 09; SCR Docs. 26/03, 023.

a) Introduction

The cod fishery on Flemish Cap has traditionally been a directed fishery by Portuguese trawlers and gillnetters, Spanish pair-trawlers and Faroese longliners. Since the reopening of the fishery in 2010, the fleet has been composed exclusively of trawlers and longliners. Cod has also been taken as bycatch in the directed redfish fishery.

The mean reported catch was 32 000 t from 1963 to 1979 with high inter annual variability. Reported catches declined after 1980, when a TAC of 13 000 t was established, but Scientific Council regularly expressed its concern about the reliability of some catches between 1963 and 1988. Alternative estimates of the annual total catch since 1988 were made available in 1995 (Figure 6.1), including non-reported catches and catches from non-Contracting Parties.

The fishery was under moratorium between 1999 and 2009. Annual bycatches between 2000 and 2005 were estimated to be below 60 t, increasing since then until the reopening of the fishery in 2010 with a TAC of 5 500 t. Since 2013, catches have remained at the level of the TAC.

Recent catches ('000 t) are as follows:

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
TAC	13.9	11.1	17.5	8.5	1.5	4.0	6.1	11.7	12.6	15.4
Catch[1]	13.9	11.5	17.5	8.5	2.1	4.0	6.2	10.6	12.5	

[1]CESAG estimates

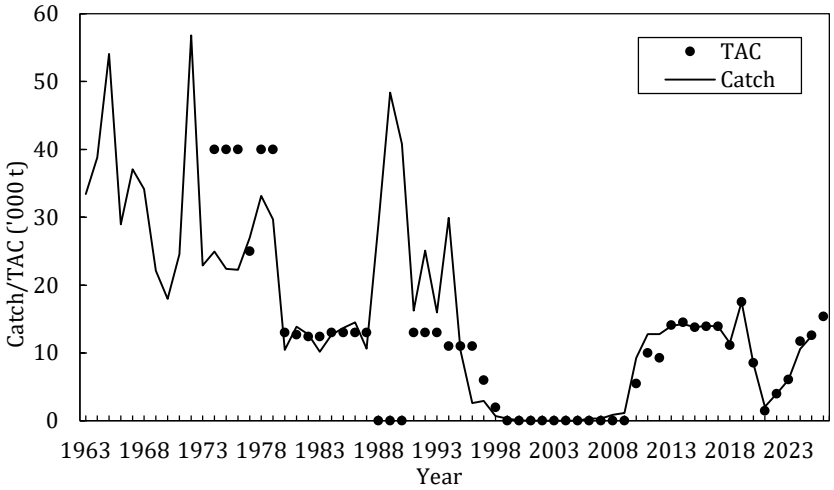


Figure 6.1. Cod in Division 3M: TAC and estimated catches.

b) Data overview

i) Commercial fisheries

In 2025 six countries fished cod in Div. 3M: trawlers from EU-Portugal, EU-Spain, United Kingdom, Norway and Russia and longliners from Faroes.

Length and age compositions from the commercial catches are available from 1972 to 2025, with the exception of the 2002 to 2005 period. In 2025 there were commercial length distributions from EU-Spain, Russia, United Kingdom, Faroes and Norway. Length sampling data by EU-Portugal were not available by the time of the assessment; therefore, this information was not considered (Figure 6.2). In 2025, the total commercial length distribution indicates a mode around 57 cm. Since 2013, the commercial catch at age data has been generated using Age Length Keys (ALKs) from the EU survey. Since 2023, the ALKs from the EU survey have not been available, and therefore the average of the last three available years (2020-2022) was used for 2023-2025. From 2015 to 2021, ages 5 to 8+ have been the most abundant in the catch, with age 4 also becoming prominent from 2022 onwards. In 2025, the most fished age was 4 (Figure 6.3).

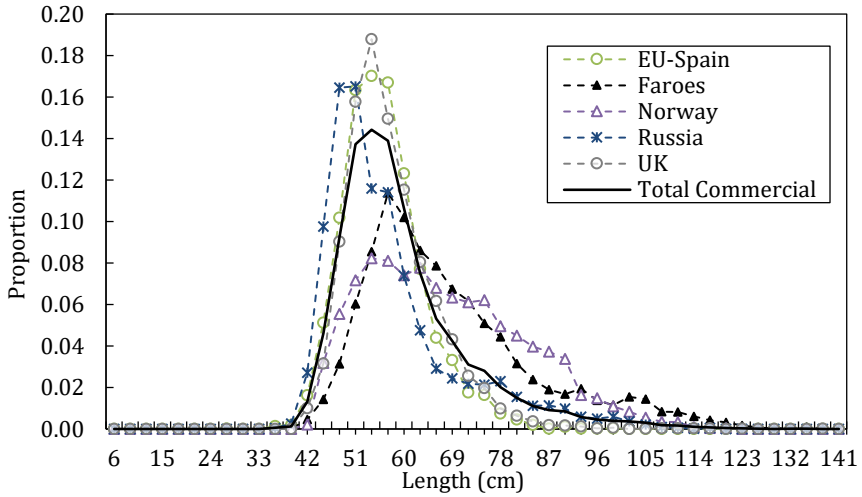


Figure 6.2. Cod in Division 3M: Length distribution of the commercial catches that were used in the assessment in 2025.

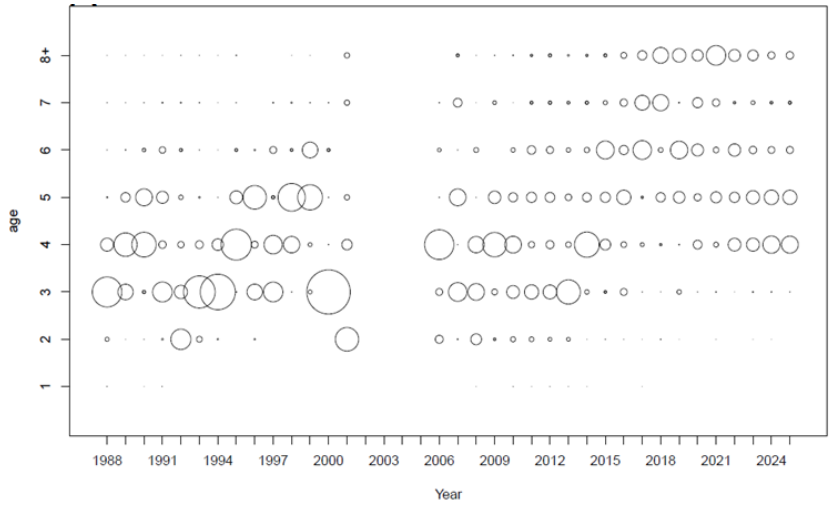


Figure 6.3. Cod in Division 3M: Commercial catch proportions at age.

ii) Research surveys

Canadian survey. Canada conducted research surveys on Flemish Cap from 1978 to 1985 on board the R/V *Gadus Atlantica*, fishing with a lined Engels 145 otter trawl. The surveys were conducted annually in January-February covering depths between 130 and 728 m. There is a declining trend for biomass and no trend for abundance over this short period (Figure 6.4).

EU survey. The EU Flemish Cap survey has been conducted since 1988 in summer with a *Lofoten* gear type. The survey indices showed a general decline in biomass from a peak value in 1989 to the lowest observed level in 2003. The biomass index increased from 2004 to 2014 and decreased until 2019. Several strong year classes over 2005 to 2012 contributed to the increase in the biomass. Abundance rapidly increased between 2005 and 2011, followed by a decline until 2019. The low levels in 2019 were followed by a slight increase in both indices, which became more pronounced since 2022. In 2024, the biomass increased to the level of 2014. The difference in timing of the peaks in biomass and abundance over 2011-2018 is driven by the very large 2009 and 2010 year classes. In 2025, both indices show a slight decrease.

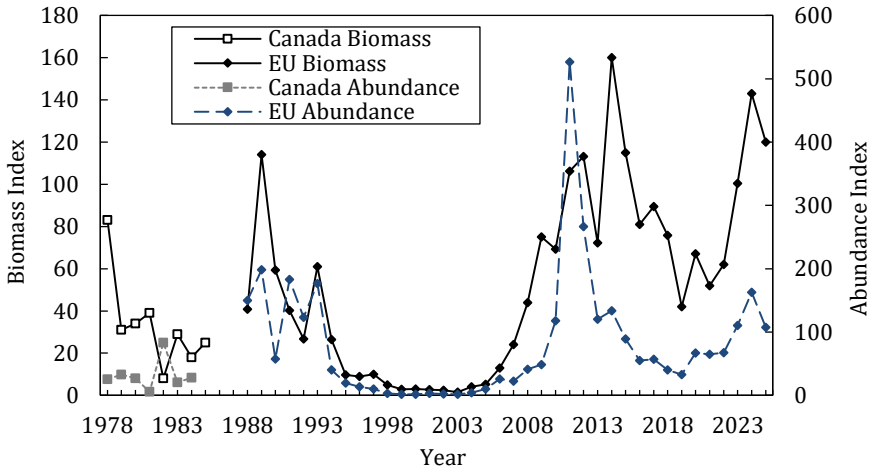


Figure 6.4. Cod in Division 3M: Survey abundance and biomass estimates from Canadian survey (1978-1985) and EU Flemish Cap survey (1988-2025).

Recruitment

Three peaks in the recruitment index in the survey can be seen in 1982-1983, 1991-1992 and 2010-2012. Recruitment has been low since 2013, with slightly higher levels during 2019-2021 (Figure 6.5).

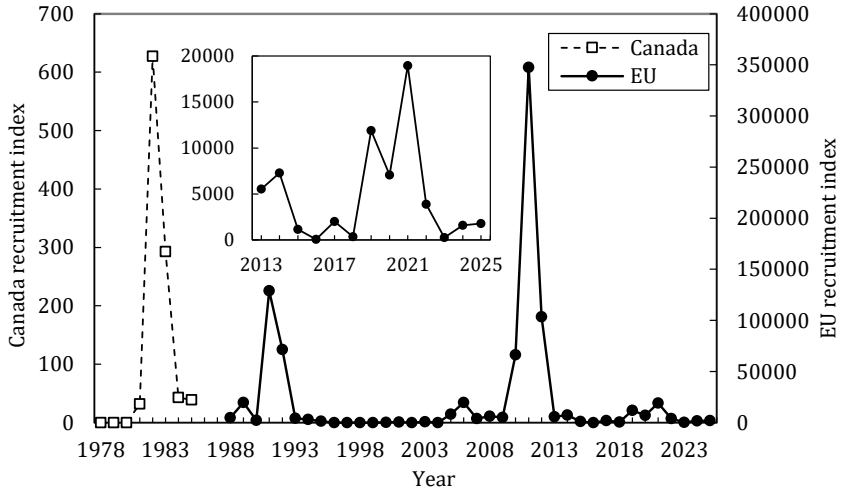


Figure 6.5. Cod in Division 3M: Number at age 1 in the Canadian survey (1978-1985) and EU survey (1988-2025). Inset plot depicts recruitment since 2013.

Biological parameters

Since 2023, age indices were derived from the average ALK from EU survey for the period 2020 to 2022. Mean weight-at-age in the stock and in the catch decreased continuously after the reopening of the fishery in 2010, until 2017-2019. Since then, both remain relatively stable (Figures 6.6 and 6.7).

Maturity ogives are available from the EU Flemish Cap survey for almost all years between 1988 and 2022. These were modelled using a Bayesian framework with missing values replaced with interpolations from adjacent years. Since 2023, the maturity ogive is not available, so the average of the last three available years was used (2020-2022). There was a continuous decline of the A_{50} (age at which 50% of fish are mature), from above 5 years old in the late 1980s to just below 3 years old in 2002 and 2003. An upward trend is present in A_{50} from 2005 to 2016, remaining relatively stable since then at around 5 years old (Figure 6.8).

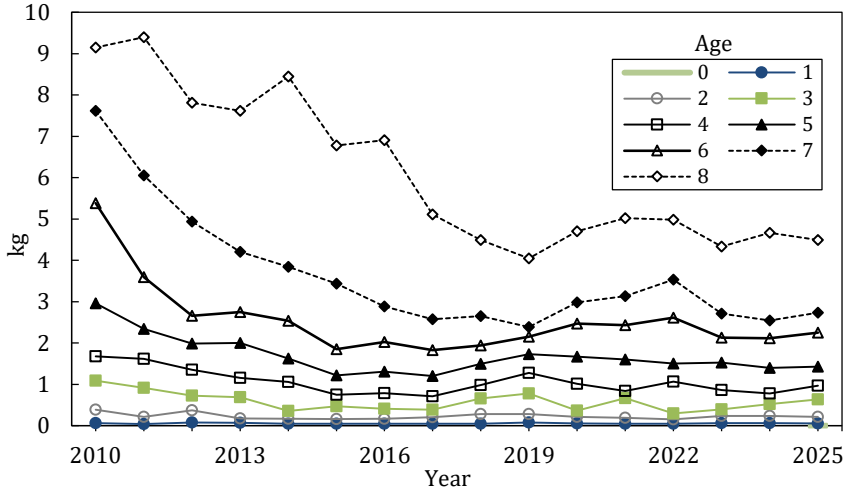


Figure 6.6. Cod in Division 3M: Mean weight-at-age in the stock for the 2010-2025 surveys.

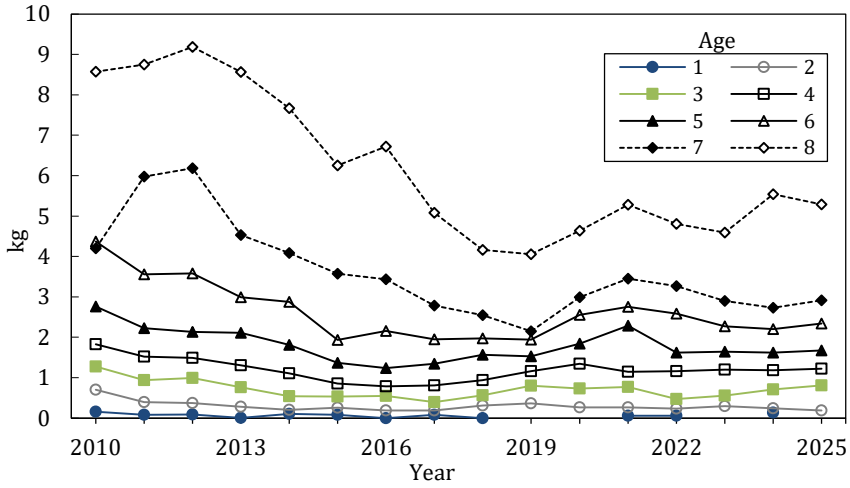


Figure 6.7. Cod in Division 3M: Mean weight-at-age in the catch for 2010-2025.

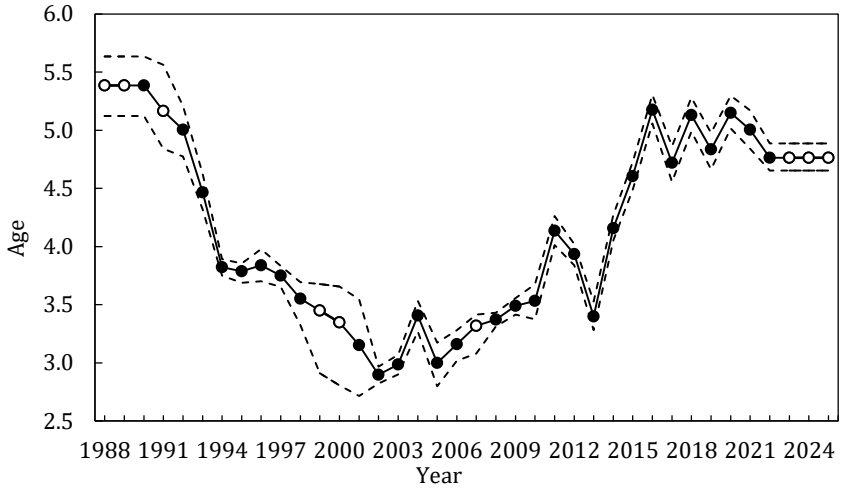


Figure 6.8. Cod in Division 3M: Age at 50% maturity (median and 90% confidence intervals) EU-Flemish Cap survey (1988-2025). Imputed values are represented in white circles.

c) Estimation of parameters

A Bayesian SCAA model, introduced at the 2018 benchmark, was used as the basis for the assessment of this stock with data from 1988 to 2025. Input data and settings are as follows:

Catch data: catch numbers and mean weight at age for 1988-2025, except for 2002-2005, for which only total catch is available. STACFIS estimates for total catch were used.

Tuning: numbers at age from EU Flemish Cap survey (1988-2025).

Ages: from 1 to 8+

Catchability analysis: dependent on stock size for age 1, estimated independently for ages 1 to 3 and for 4+ as a group.

Natural Mortality: M was set via a lognormal prior constant over years and variable through ages. Prior median is the same as last year assessment.

Additional priors: for recruitment in all the years, for the number-at-age for ages 2-8+ in the first year, for a year factor for F (f), for selectivity (rC), and for the natural mortality.

Likelihood components: for total catch, for catch numbers-at-age and numbers-at-age of the survey.

The model components are defined as follows:

Input data	Model component	Parameters
R 1988-2025	$LN(medrec, cvrec)$	*medrec*=45000, *cvrec*=10
N(1988,a), a=2-8+	Ages 2-7 $LN\left(median = medrec \times e^{-\sum_{age=1}^{a-1} M(age)+medFsurv(age)}, cv = cvsurv\right)$ Ages 8+ $LN\left(median = medrec \times \frac{e^{-\sum_{age=1}^{A-1}(M(age)+medFsurv(age))}}{1-e^{-M(A+)+medFsurv(A+)}}, cv = cvsurv\right)$	*medFsurv*(1,...,7)={0.0001, 0.1, 0.5, 0.7, 0.7, 0.7, 0.7} *cvsurv*=10
f(y) y=1988-2025	Year 1988 $LN(median = medf,\ cv = cvf)$ Years 1989-2025 $LN(median = AR(1) over\ f,\ cv = cvf)$	*medf*=0.2, *cvf*=4
rC(y,a), a=2,8+ 1988-2025	Year 1988 $LN(median = medrC(a),\ cv = cvrC(a))$ Years 1989-2025 $LN(median = last\ year\ rC,\ cv = cvrCcond)$	*medrC*(a)=c(0.01,0.3,0.6,0.9,1,1,1), *cvrC*(a)=c(4,4,4,4,4,4) *cvrCcond*=0.2
Total Catch 1988-2025	$LN\left(median = \sum_{age=1}^{A+} mu.C(y,age)\, wcatch(y,age),\ cv = cvcW\right)$ $mu.C(y,a) = N(y,a)\left(1-e^{-Z(y,a)}\right)\frac{F(y,a)}{Z(y,a)}$	*cvCW=0.077*

Catch Numbers at age, a=2,8+ 1988-2025	$LN\left(median = mu.C\left(y,a\right),\ cv = cv.C\right)$	$cv.C$=0.2
EU Survey Indices (I) 1988-2025	$I(y) \sim LN\left(median = \mu(y,a),\ cv = cvEU\right)$ $\mu(y,a) = q(a)\left(N(y,a)\frac{e^{-\alpha Z(y,a)} - e^{-\beta Z(y,a)}}{(\beta-\alpha)Z(y,a)}\right)^{\gamma(a)}$ $\gamma(a)\begin{cases}\sim N(\text{mean}=1, \text{variance}=0.25),\ if\ a=1\\ =1,\ if\ a\geq 2\end{cases}$ $\log(q(a)) \sim N(\text{mean}=0, \text{variance}=5)$	I is the survey abundance index q is the survey catchability at age N is the stock abundance index $cvEU$=0.3 α = 0.5, β = 0.58 (survey made in July) Z is the total mortality
M	$M \sim LN(medM, cvM)$	$MedM$=c(1.26,0.65,0.44,0.35,0.30,0.27,0.24,0.24) cvM=0.15

d) Assessment results

Total Biomass and Abundance: The median total abundance declined by 78% between 2012 and 2016. In 2021 a steep increase is observed, declining since then. Median biomass also declined by 58% over 2012 to 2020, remaining relatively stable in recent years (Figure 6.9).

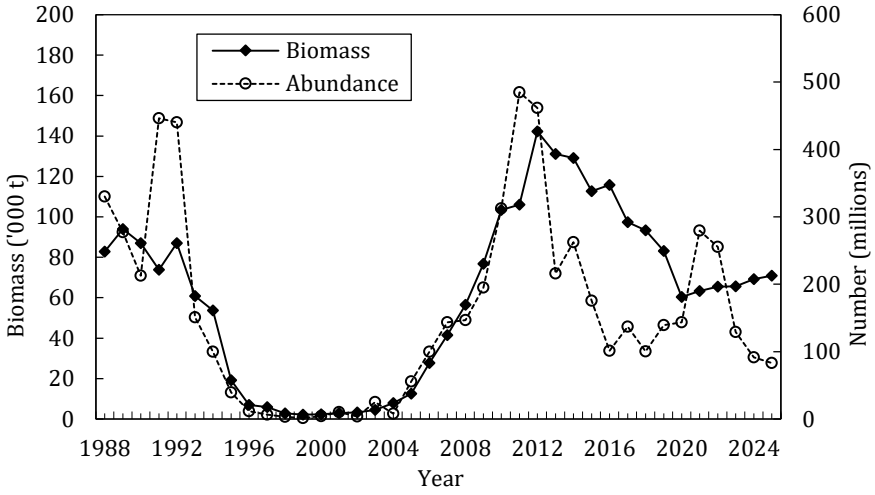


Figure 6.9. Cod in Div. 3M: Biomass and Abundance estimates.

Spawning stock biomass: Estimated median SSB (Figure 6.10) increased from the early 2000s to the mid-2010s, after which it decreased until the early 2020s, remaining relatively stable since then. The probability of being below B_{lim} in 2025 is negligible (<1%). The median SSB has been below $B_{trigger}$ since 2020 (Cautious Zone). The probability of being below $B_{trigger}$ in 2025 is 52%.

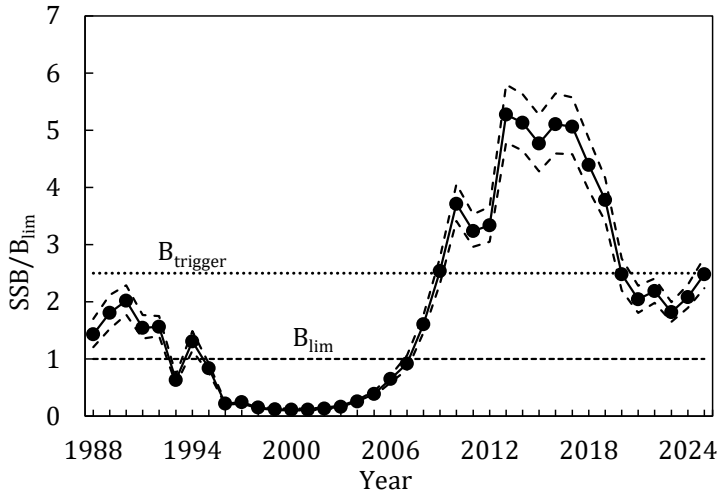


Figure 6.10. Cod in Div. 3M: Median and 80% probability intervals SSB/B_{lim} estimates. The horizontal dashed lines correspond to SSB = $B_{trigger}$ and SSB = B_{lim}.

Recruitment: Since 2013 the recruitment has oscillated around intermediate levels, much lower than those in 2011-2012 (Figure 6.11). In 2021 and 2022, good recruitments were observed, while since 2023 recruitment has been at a very low level.

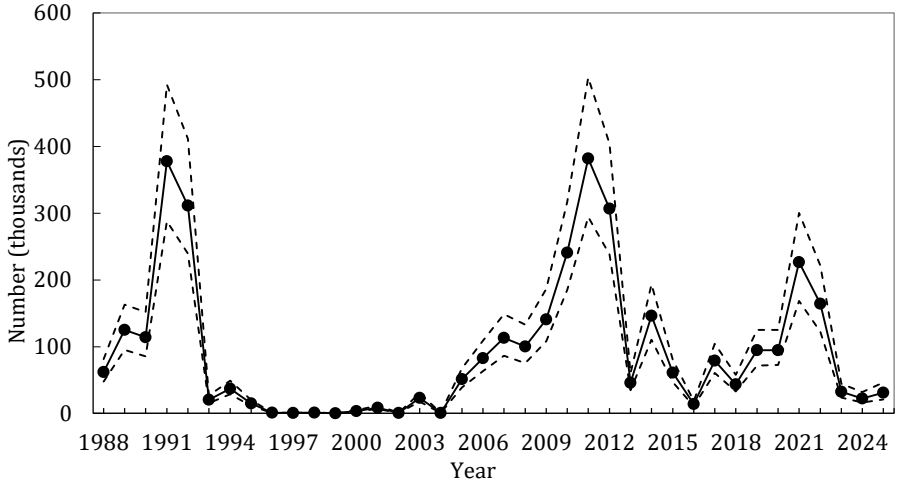


Figure 6.11. Cod in Div. 3M: Recruitment (age 1) estimates and 80% probability intervals.

Fishing mortality: The median F increased in 2010 with the re-opening of the fishery but remained below F_{lim}. The median F has been below F_{target} during that period except in 2011. In 2021, the minimum level of F since the re-opening was reached, increasing since then. In 2025 F is below F_{lim} and F_{target} with a high probability (Figure 6.12).

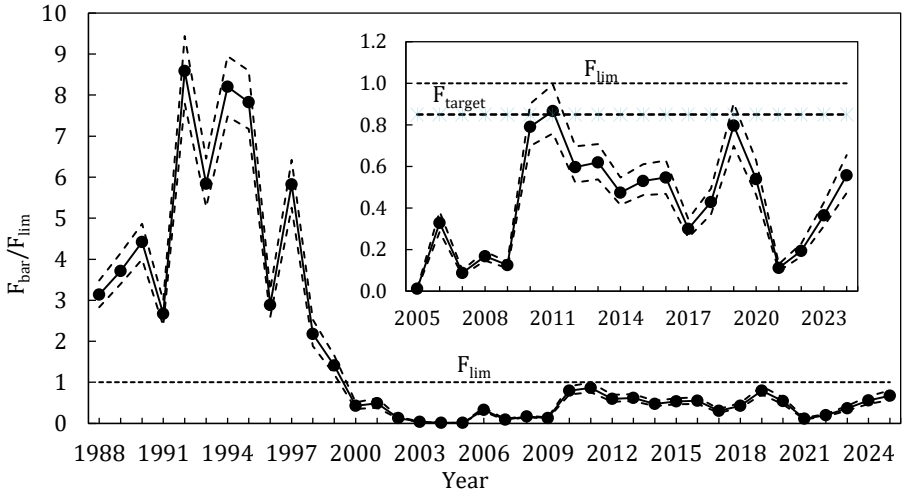


Figure 6.12. Cod in Div. 3M: F_{bar} (ages 3-5) estimates and 80% probability intervals. The horizontal dashed line corresponds to $F_{bar}=F_{lim}$ and, additionally in the inset plot (which shows values from 2005 onwards only), $F_{bar}=F_{target}$.

Natural mortality: The posterior medians of M by age estimated by the model were:

Age	1	2	3	4	5	6	7	8
Posterior	1.38	0.60	0.32	0.24	0.27	0.40	0.35	0.34

e) Retrospective analysis

A five-years retrospective analysis with the Bayesian model was conducted by eliminating successive years of catch and survey data. Figures 6.13 to 6.15 present the retrospective estimates for age 1 recruitment, SSB and F_{bar} at ages 3-5.

The retrospective analysis shows revisions in the recruitment, mainly regarding the highest values of recruitment in the years 2009 to 2011 and 2021 (Figure 6.13). These revisions lead to subsequent revisions in the SSB (Figures 6.14). No directional patterns in retrospective analysis are evident in recent years. There is very little evidence of a retrospective pattern in F (Figure 6.15).

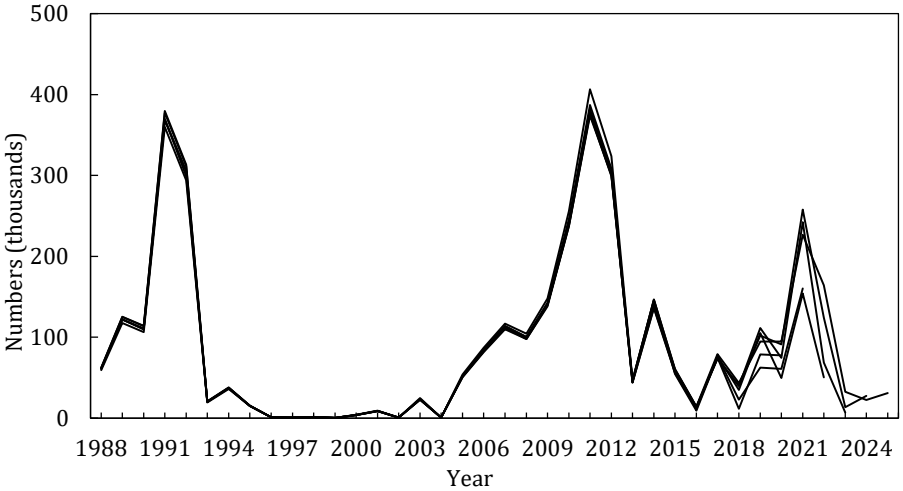


Figure 6.13. Cod in Div. 3M: Retrospective results for recruitment.

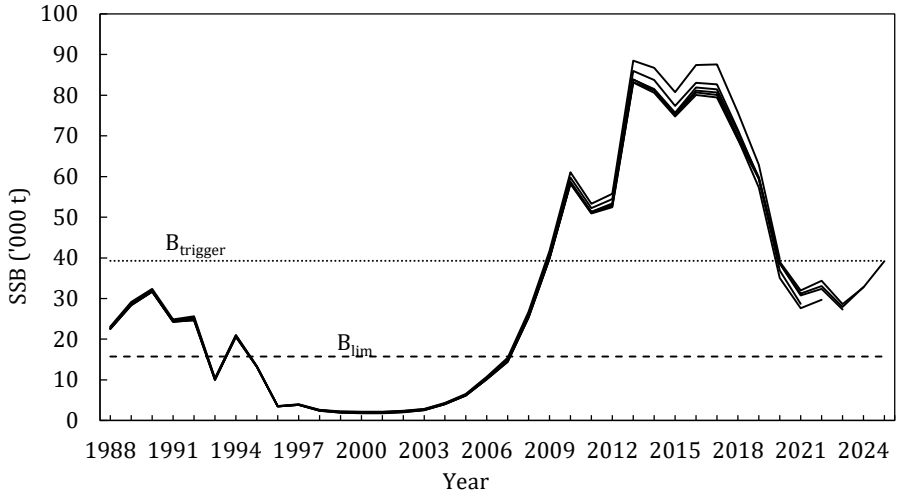


Figure 6.14. Cod in Div. 3M: Retrospective results for SSB.

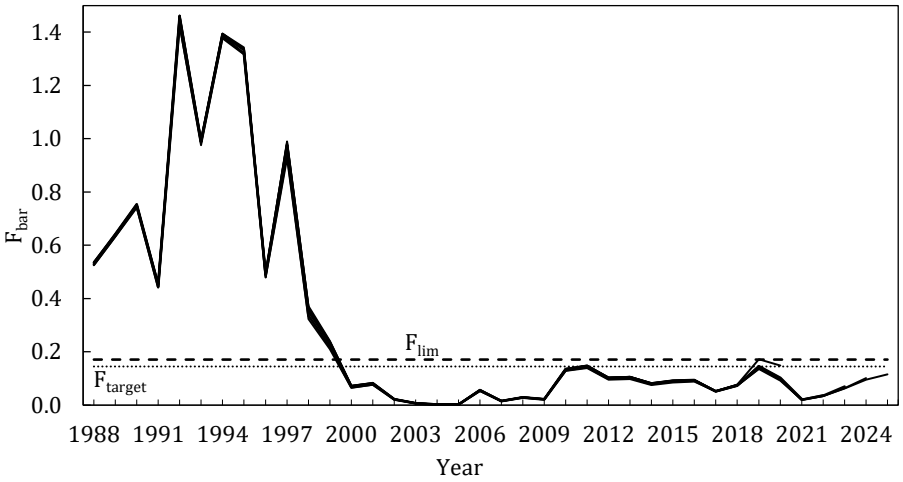


Figure 6.15. Cod in Div. 3M: Retrospective results for average fishing mortality.

f) State of the stock

The median SSB declined rapidly since 2017 but has remained stable during the last 5 years and is estimated to be above B_{lim} and below $B_{trigger}$ (Cautious Zone) in 2025. Since 2013, recruitment has varied at intermediate levels but much lower than those observed in 2011-2012. In 2021 and 2022, good recruitments were observed, while since 2023 recruitment has been at a very low level. Fishing mortality has remained below F_{lim} since the fishery reopened in 2010. Fishing mortality has been below F_{target} during that period except in 2011. In 2021, the minimum level of F since the re-opening was reached, increasing since then. In 2025, F is below F_{lim} and F_{target} with a high probability.

g) Reference points

In 2025, SC approved the Reference Points to be applied under the new Precautionary Approach Framework. B_{msy} is defined for this stock as the equilibrium SSB that corresponds to the $F_{35\%SPR}$. B_{lim} is 30% B_{msy} (B_{lim} = 15 724 t). $B_{trigger}$ is approved to be 75% B_{MSY} ($B_{trigger}$ = 39 310 t). F_{lim} corresponds to $F_{35\%SPR}$ (F_{lim} = 0.171) and F_{target} is the 85% of F_{lim} (F_{target} = 0.145).

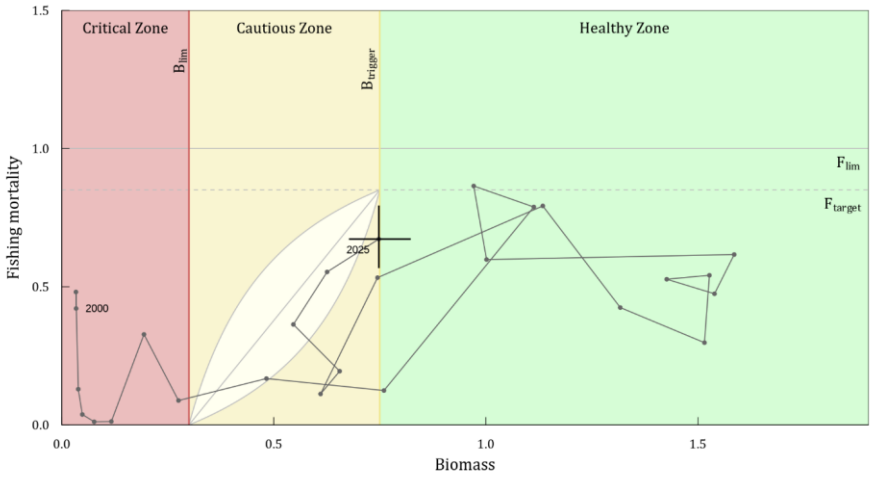


Figure 6.16. Cod in Div. 3M: Stock-Fbar (3-5) (posterior medians) plot in the NAFO Precautionary Approach Framework. Points plotted are from years 2000-2025.

h) Stock projections

Stochastic projections were conducted. The variability in the input data is taken from the results of the Bayesian assessment. Input data for the projections are as follows:

Numbers aged 2 to 8+ in 2026: estimated from the assessment.

Recruitments for 2026-2027: Recruits per spawner were drawn randomly from 2022-2024.

Maturity ogive for 2026-2028: Mean of the last three years available (2020-2022) maturity ogive.

Natural mortality for 2026-2027: 2024 natural mortality from the assessment results.

Weight-at-age in stock and weight-at-age in catch for 2026-2028: Mean of the last three years' weight-at-age (2023-2025).

PR at age for 2026-2027: Mean of the last three years' PR (2023-2025).

F_{bar} *(ages 3-5)*: F_{bar} = 0 and the three levels defined for stocks in the Cautious Zone (fishing mortality along the lower, midrib and upper edge leaf).

All scenarios assumed that the Yield for 2026 is the established TAC (15 360 t).

F_{bar} is the mean of the F at ages 3-5 and used as the indicator of overall fishing mortality.

The stock is projected to be in the Cautious Zone starting in 2027. Under all the scenarios (including F=0) during the projected years, the stock will remain in the Cautious Zone (below $B_{trigger}$) with a probability of at least 60%; furthermore, the median biomass at the beginning of 2028 is projected to be lower relative to 2026 (Tables 6.1 and 6.2 and Figures 6.17 to 6.20).

Under all scenarios, the probability of F_{bar} exceeding F_{lim} is less than or equal to 15% in 2027.

Table 6.1. Medium-term projections

	B		SSB		Yield
F_{bar}=0					
2026	63228	(56629 - 70987)	44861	(39607 - 51065)	15360
2027	49128	(42537 - 56774)	36982	(31283 - 43310)	0
2028	50035	(43290 - 57882)	38095	(32621 - 44667)	-
F lower edge leaf (median=0.109)					
2026	63228	(56629 - 70987)	44861	(39607 - 51065)	15360
2027	49128	(42537 - 56774)	36982	(31283 - 43310)	10086
2028	39829	(33191 - 47629)	28119	(22761 - 34600)	-
F midrib leaf (median=0.131)					
2026	63228	(56629 - 70987)	44861	(39607 - 51065)	15360
2027	49128	(42537 - 56774)	36982	(31283 - 43310)	11756
2028	38119	(31525 - 45943)	26489	(21186 - 32970)	-
F upper edge leaf (median=0.140)					
2026	63228	(56629 - 70987)	44861	(39607 - 51065)	15360
2027	49128	(42537 - 56774)	36982	(31283 - 43310)	12452
2028	37423	(30828 - 45239)	25809	(20489 - 32230)	-

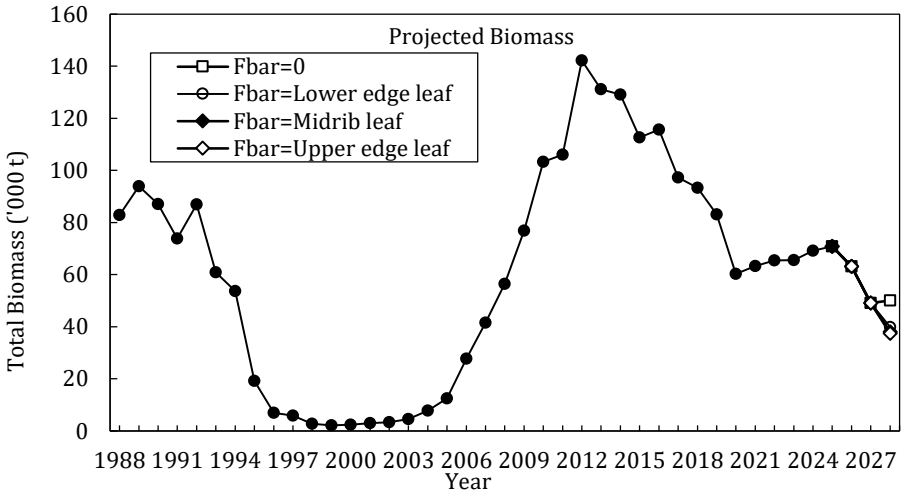


Figure 6.17. Cod in Div. 3M: Projected total biomass under all the scenarios.

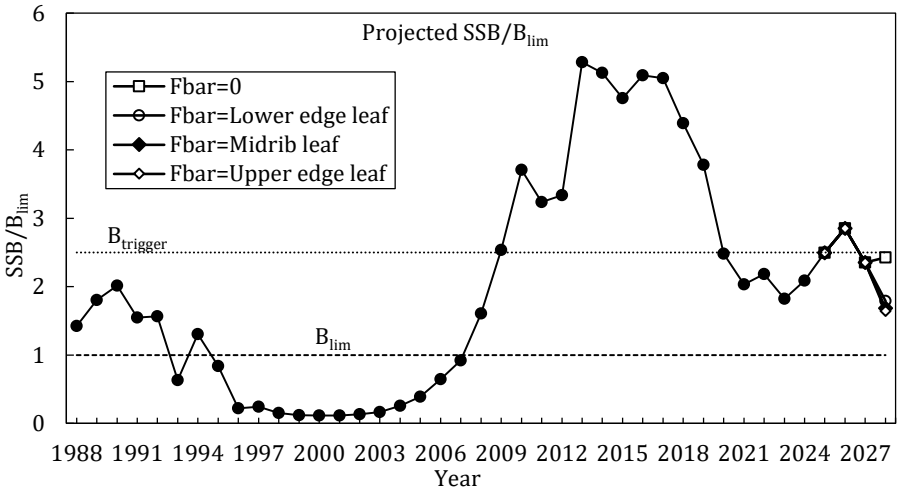


Figure 6.18. Cod in Div. 3M: Projected SSB relative to B_{lim} under all the scenarios.

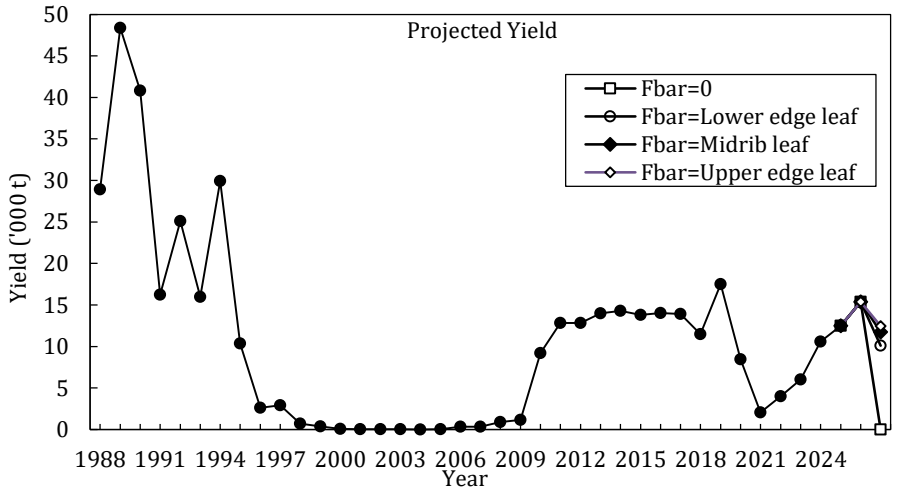


Figure 6.19. Cod in Div. 3M: Projected removals under all the scenarios.

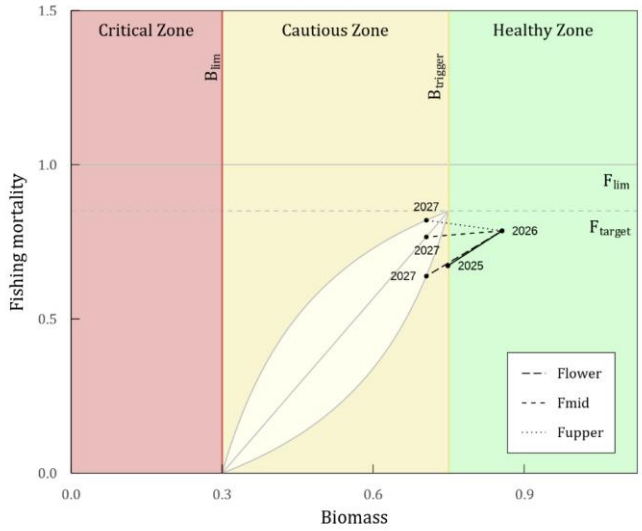


Figure 6.20. Atlantic cod in Div. 3M. Stochastic projections in the NAFO PA Framework for 2027.

Table 6.2 Projected yield (t), probabilities of SSB < B_{lim}, SSB < $B_{trigger}$, F_{bar} > F_{lim} and F_{bar} > F_{target}, and probability of stock growth ($P(SSB_{2028} > SSB_{2026})$ and $(SSB_{2028}-SSB_{2026})/SSB_{2026}$) under the projected F values.

			Cautious Zone		
		F=0	F lower edge leaf (median=0.109)	F midrib leaf (median=0.131)	F upper edge leaf (median=0.140)
Yield (50%)	2026	15360	15360	15360	15360
	2027	0	10086	11756	12452
$P(F>F_{lim})$	2026	6%	6%	6%	6%
	2027	<1%	1%	8%	15%
$P(SSB<B_{lim})$	2026	<1%	<1%	<1%	<1%
	2027	<1%	<1%	<1%	<1%
	2028	<1%	<1%	<1%	<1%
$P(F>F_{target})$	2026	30%	30%	30%	30%
	2027	<1%	7%	28%	42%
$P(SSB<B_{trigger})$	2026	9%	9%	9%	9%
	2027	70%	70%	70%	70%
	2028	60%	99%	>99%	>99%
$P(SSB_{2028}>SSB_{2026})$		<1%	<1%	<1%	<1%
$(SSB_{2028} - SSB_{2026}) /SSB_{2026}$		-16%	-38%	-41%	-43%

i) Research recommendations

STACFIS **recommended** that *an age reader intercalibration exercise be conducted.*

STATUS: An age-readers workshop was held in November 2017 in order to reconcile the differences among age-readers of this stock. Much progress in understanding where the differences between the commercial and survey ALKs come from was made but still needs more research to better understand the problem. No progress since then was made. STACFIS reiterates this **recommendation.**

STACFIS **encouraged** all Contracting Parties to continue to provide length distribution samples from the commercial vessels fishing 3M cod.

STACFIS **recommended** that *the ALK and maturity ogive for this stock is provided annually.*

No progress.

j) Special comments

Scientific Council notes the increased uncertainty in the assessment and projections due to the lack of data (age length keys and maturity ogives) since 2023. The increased uncertainty is unquantified and not reflected in the risk table.

The next full assessment for this stock will be in 2027.

7. Redfish (*Sebastes mentella* and *Sebastes fasciatus*) in Division 3M

Deferred to September 2026.

8. American plaice (*Hippoglossoides platessoides*) in Division 3M

Full assessment. SCR Docs. 23/024, 26/003; SCS Docs. 24/06, 11, 25/08, 09, 26/05, 06, 10.

a) Introduction

The American plaice stock occurs mainly at depths shallower than 600 m on Flemish Cap. Since 1992, catches have been taken mainly as bycatch in the otter trawl fishery.

Nominal catches during 1960 to 1973 varied with a peak of about 5 341 t in 1965. Catches of this stock became regulated in 1974 and ranged from 275 t (1993) to 5 600 t (1987) until 1996. Since 1997 catches have remained low and declined to a historical minimum in 2012 (63 t). Catches increased in recent years, fluctuating between 120 and 371 t and are taken mainly as bycatch in the Div. 3M redfish and cod fisheries

From 1979 to 1993 a TAC of 2 000 t was in effect for this stock. A reduction to 1 000 t was agreed for 1994 and 1995 and a fishery moratorium was agreed to thereafter (Figure 8.1).

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

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
TAC	ndf	ndf	ndf	ndf	ndf	ndf	ndf	ndf	ndf	ndf
Catches [1]	0.2	0.2	0.3	0.2	0.1	0.1	0.1	0.2	0.4	

ndf No directed fishing.
1 CESAG estimates

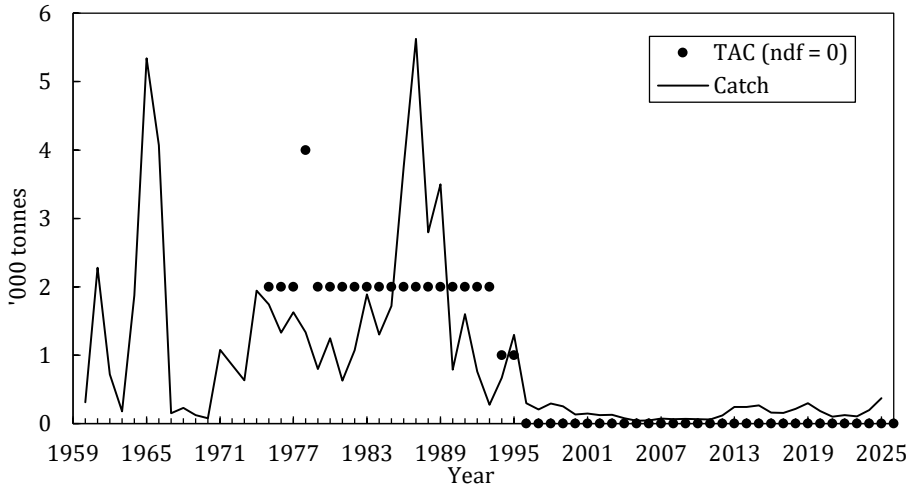


Figure 8.1. American plaice in Div. 3M: TACs and estimated catches. No directed fishing is plotted as 0 TAC.

b) Data overview

i) Commercial fishery data

EU-Portugal and Russia provided length composition data for the 2023, 2024 and 2025 trawl catches. Spain provided length composition data for the 2025 trawl catches. The length frequencies were used to estimate the total catch length compositions for those years. There are no dominant lengths in catches between 2023 and 2025, with catches distributed mainly between 40 and 56 cm.

ii) Research survey data

Research surveys have been conducted by the EU since 1988.

USSR/Russia conducted surveys from 1972 to 1993 with two additional surveys conducted in 2001 and 2002. From 1972 to 1982 the USSR survey used a fixed-station design. Since 1983 USSR/Russia adopted a stratified random survey design and the USSR surveys for 1972 to 1982 were post-stratified for comparison to the new survey series.

Canada conducted research vessel surveys from 1978 to 1985, and a single survey was conducted in 1996.

The USSR/Russia survey series (1972-1993) shows high variability; there was a decreasing trend during 1986-1993 (Figure 8.2). The EU survey series had a continuous decreasing trend in abundance and biomass from the beginning of the series to 2000 and has remained low. The EU survey biomass shows a faster upward trend until 2025 than the abundance, due to the growth of existing year classes. In 2025, the EU survey biomass is well above the series mean, whilst the abundance from the survey is only slightly above the series mean (Figure 8.2).

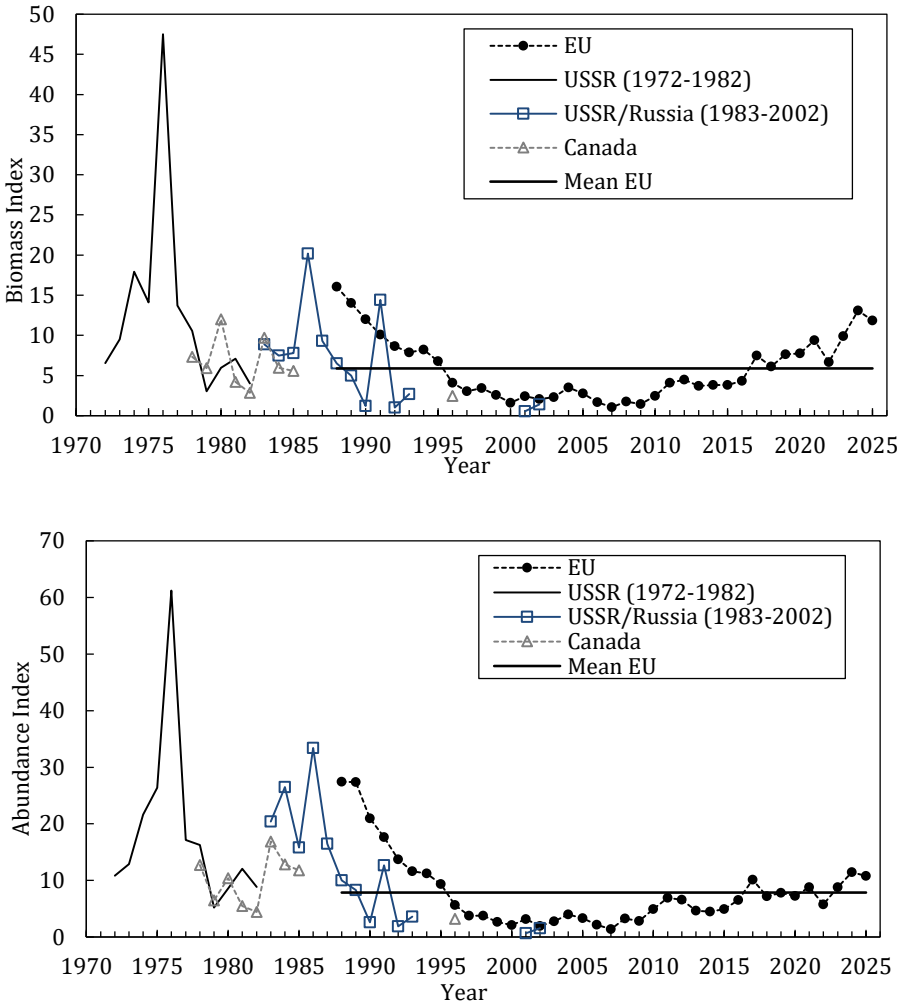


Figure 8.2. American plaice in Div. 3M: trends in survey biomass and abundance indices. The mean is shown for the EU survey only.

c) Estimation of parameters

No ALKs were available for recent years (2020-2025), therefore, it was not possible to update any age-dependent data, matrices or analyses, for either the stock or the catches. In the full assessment carried out in 2023, the maximum mean length for ages 1 to 4 were calculated based on the EU survey mean length at age 1988-2019 matrix. The abundances less than 36 cm were considered a proxy for age 1 to 4 recruits.

A fishing mortality index (C/B) is given by the catch and EU survey total biomass ratio.

d) Survey results

The fishing mortality index (C/B) declined from the mid-1980s to the mid-2000s and has since fluctuated around low levels within its time series (Figure 8.3).

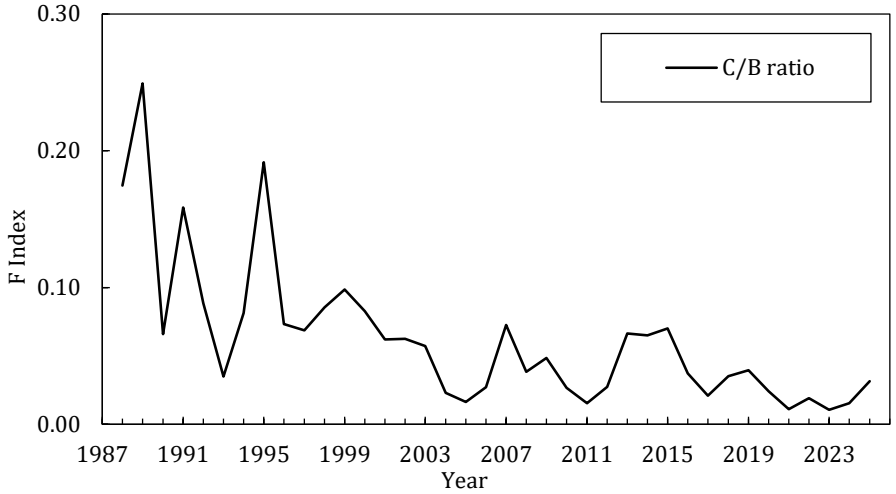


Figure 8.3. American plaice in Div. 3M: fishing mortality (catch/biomass) index from EU survey.

Recruitment was estimated to be weak from 1995 to 2007. Two pulses of recruitment were observed from 2008-2012 and 2015-2018 but with less strength than those before the mid-1990s, since then the recruitment has been poor (Figure 8.4).

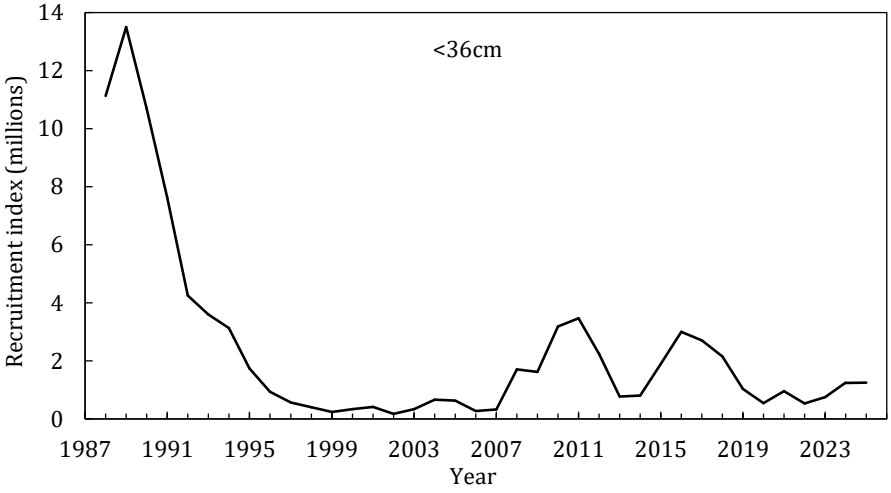


Figure 8.4. American plaice in Div. 3M: EU survey recruitment proxy. <36 cm proxy for ages 1-4.

e) Assessment results

No analytical assessment was performed.

Biomass: Survey biomass index increased from 2007, which was its lowest recorded level, until 2025 and increased to levels above the average for the entire series. The biomass index is currently above the long-term mean of the EU survey series.

Fishing Mortality: The fishing mortality index (C/B) declined from the mid-1980s to the mid-2000s and has since fluctuated around low levels within its time series.

Recruitment: Recruitment was estimated to be weak from 1995 to 2007. Two pulses of recruitment were observed from 2008-2012 and 2015-2018 but with less strength than those before the mid-1990s; since then, the recruitment has been poor.

f) State of the stock

The survey biomass index increased from 2007 mainly due to two recruitment pulses in 2008-2012 and 2015-2018, and increased to levels above the average for the entire series. However, recruitment has been poor since 2018 and the fishing mortality index remains around low levels within its time series.

g) Reference points

STACFIS is not able to provide proxies for PA reference points at this time.

h) Research recommendations

STACFIS **recommended in 2023** that *other types of models should also be explored, and that Div. 3M American plaice stock be a candidate for an assessment benchmark together with the Div. 3LNO American plaice stock or other flatfish stocks.*

Initial attempts have been made and presented to STACFIS to explore other models (e.g. biomass dynamic models) and the results are promising. Work is ongoing.

STACFIS **recommends** *further investigation into whether current bycatch F levels are impeding stock recovery.*

This recommendation was not addressed at this time.

The next full assessment for this stock will be in 2029.

STOCKS ON THE GRAND BANKS (NAFO DIVISIONS 3LNO)

Environmental Overview

The STACFEN Committee did not meet during the 2026 SC June meeting. Therefore, no environmental overviews, including the update of environmental conditions for 2025, were available to SC. The lack of this information increases the uncertainty of all stock assessments, as any potentially relevant environmental connections would have gone undetected.

9. Cod (*Gadus morhua*) in NAFO Divisions 3NO

Interim Monitoring Report. SCR Docs. 26/01, 02; SCS Docs. 26/05, 06, 07, 09, 10.

a) Introduction

This stock has been under moratorium to directed fishing since February 1994. Total bycatch during the moratorium increased from 170 t in 1995, peaked at about 4 800 t in 2003 and has been between 200 t and 1 100 t since that time. The bycatch in 2025 was 355 t.

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

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
TAC	ndf	ndf	ndf	ndf	ndf	ndf	ndf	ndf	ndf	ndf
Catches[1]	0.6	0.4	0.5	0.6	0.5	0.4	0.3	0.2	0.4	

ndf - No directed fishery
[1] CESAG estimates

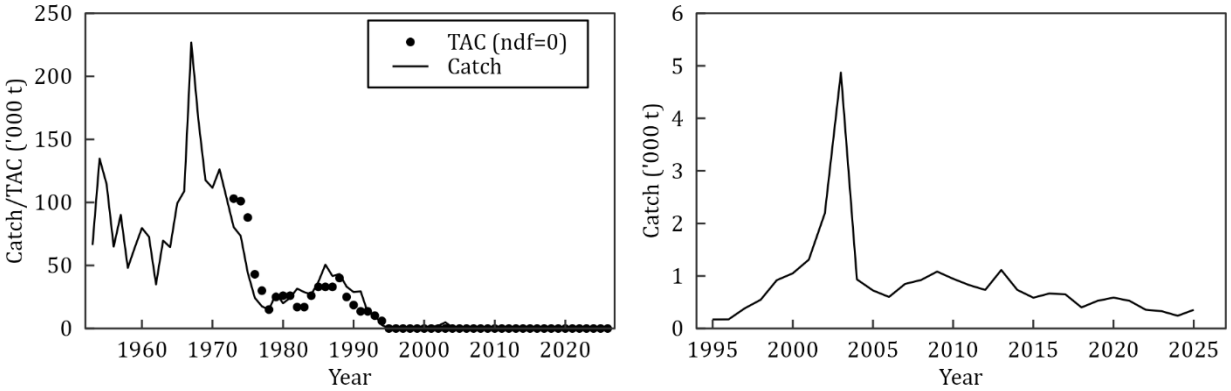


Figure 9.1. Cod in Divs. 3NO: TACs and estimated catches. Panel at right highlights catches during the moratorium on directed fishing.

b) Data overview

Canadian bottom trawl surveys. There were no Canadian surveys in Divs. 3NO in spring 2020 and 2021 or autumn 2021 and 2022. The most recent surveys were completed with new research vessels and a modified trawl. Results for those surveys are directly comparable with previous surveys without the need to apply a conversion factor. The spring survey biomass index declined from 1984 to 1995 and has generally remained low since that time (Figure 9.2). There was an increase in biomass during 2011-2014 but indices subsequently declined and have remained low. The trend in the autumn survey biomass index was similar to the spring series (Figure 9.2).

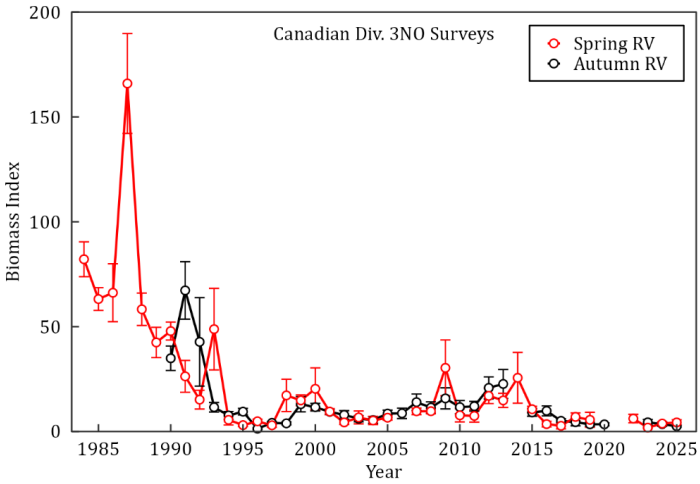


Figure 9.2. Cod in Divs. 3NO: survey biomass index (+ 1 sd) from Canadian spring and autumn research surveys.

EU-Spain Divs. 3NO surveys. The biomass index was relatively low and stable from 1997-2008 (Figure 9.3). There was a considerable increase in the index from 2008-2011, followed by a decline to 2013. In 2014, the index increased to the highest value in the time series but has continually decreased in subsequent years. There was no EU-Spain survey in Divs. 3NO in 2020 but the index remained low in the 2021 to 2025 surveys.

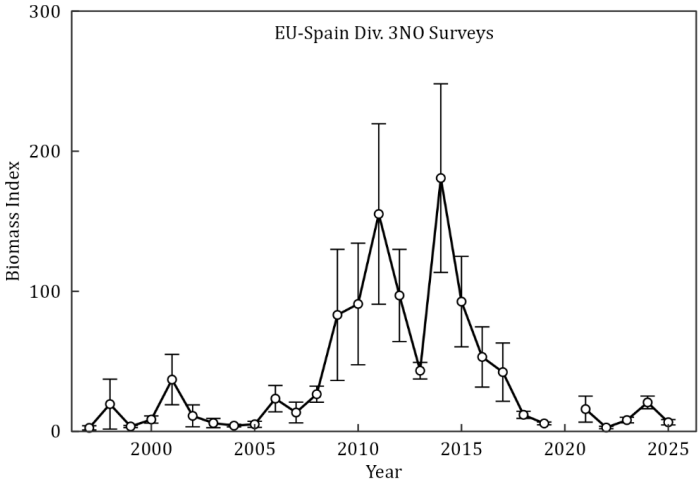


Figure 9.3. Cod in Divs. 3NO: survey biomass index (+ 1 sd) from EU-Spain Divs. 3NO surveys.

c) Conclusion

The most recent analytical assessment (2021) concluded that SSB was well below B_{lim} (60 000 t) in 2020. Canadian RV surveys in 2025 remained among the lowest in the time series. The EU-Spain survey index remained low in 2025. Overall, the 2025 indices are not considered to indicate a significant change in the status of the stock.

There will be no new assessment until monitoring shows that conditions have changed or a benchmark process has been completed

10. Redfish (*Sebastes mentella* and *Sebastes fasciatus*) in Divisions 3L and 3N

Full assessment. SCR Docs. 26/01, 02, 26; SCS Docs. 26/06, 07, 10.

a) Introduction

This stock includes two species of redfish in Divisions 3L and 3N, the deep-sea redfish (*Sebastes mentella*) and the Acadian redfish (*Sebastes fasciatus*) that have been commercially fished and reported collectively as redfish in fishery statistics. Both species, occurring in Divs. 3LN, are managed as a single stock and are thought to belong to a large Northwest Atlantic complex ranging from the Gulf of Maine to south of Baffin Island.

b) Fisheries and Catches

Between 1959 and 1960 reported catches dropped from 44 600 to 26 600 t, oscillating over the next 25 years (1960-1985) around an average level of 21 000 t. Catches increased to a 79 000 t high in 1987 and declined steadily to a 450 t minimum reached in 1996. A moratorium on directed fishing for this stock was implemented in 1998. Catches remained at relatively low levels (450-3 000 t) until 2009. From 2009 onwards catches steadily increased to 13 050 t in 2019, the highest level recorded since 1993. Since then, catches have been decreasing and have remained below the TAC. In 2025, total catch was estimated to be 4 804 t.

Table 10.1. Recent catches and TACs ('000 t) of redfish in NAFO Divs. 3LN

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
TAC	14.2	14.2	18.1	18.1	18.1	18.1	18.1	18.1	6	6
Catches[1]	11.8	11.3	13.1	11.1	12.1	9.0	8.2	9.4	4.8	

[1] CESAG estimates

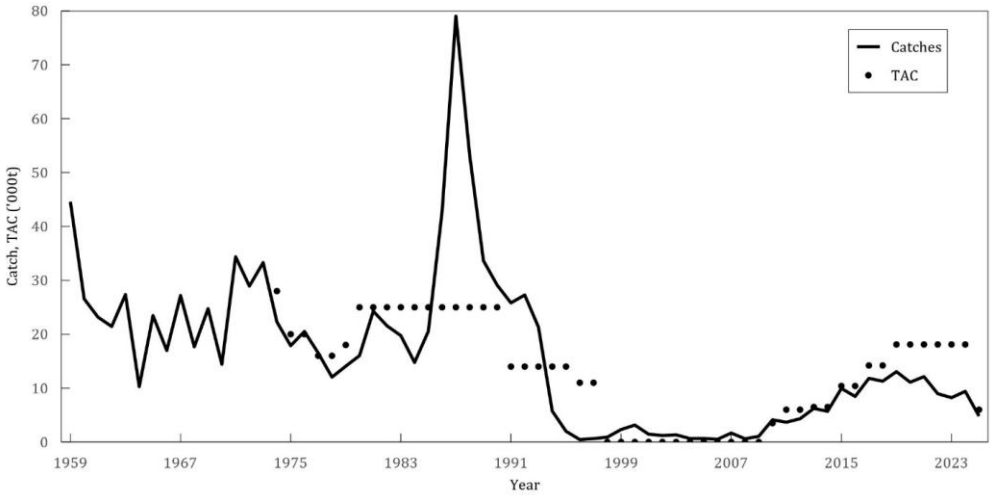


Figure 10.1. Redfish in Divs. 3LN: TACs and estimated catches.

c) Data Overview

i) Commercial fishery data

Most of the commercial length sampling data available for the 3LN redfish since 1990 comes from the Portuguese fisheries with data available from Spanish and Estonian fisheries since 2002 and 2008, respectively, as well as more limited data available from other countries. Commercial length frequency data has largely been absent from the Canadian fishery since 1991, with only sporadic sampling of often small sized fish.

ii) Research survey data

Canadian RV surveys

Multiple vessels have been used to complete the Canadian spring and autumn bottom trawl surveys. Comparative fishing for the Newfoundland and Labrador surveys was largely inconclusive for 3LN redfish due to limited sample size and/or poor spatial coverage. Indices presented here are in Campelen and Modified Campelen units, consistent with recommendations in SCR Doc. 25/027.

Canadian stratified random surveys that cover the entire stock area began in 1991. Surveys were incomplete in spring 2006 and 2017, and autumn 2014. There was no spring survey in 3LN in 2021, or in autumn in 2021 or 2022.

EU RV surveys

In 1995 EU-Spain started a stratified-random bottom trawl spring (May-June) survey in the NAFO Regulatory Area (NRA) of Divs. 3NO. All strata within the NRA were covered every year following the standard stratification. Early surveys were completed to a depth of 732 m and were extended to 1464 m in 1998 (SCR Doc. 20/008). In 2003, this survey was extended northwards to include strata in Div. 3L, but it has only been since 2006 that an adequate coverage of 3L has been accomplished in this survey (SCR Doc. 20/14). The EU-Spain survey was not completed in 3N in 2020 or 3L in 2020- 2022.

Biomass indices

Redfish bottom trawl biomass estimates from surveys in Divs. 3LN remained well below average level over the 1990s and early- to mid-2000s (Figure 10.2). From the mid-2000s, most indices began to show increases with each index peaking in the mid-2010s. Since the mid-2010s, there have been some conflicting signals between survey indices; however, recent trends among different surveys are difficult to determine due to coverage gaps in recent years and a lack of appropriate conversion factors for the recent Canadian indices. Biomass estimates from the EU-Spain 3L surveys have shown an upward trend since 2023.

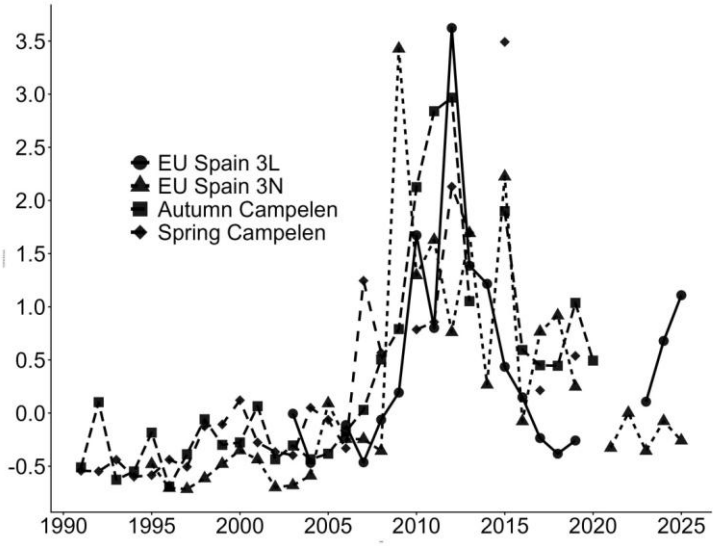


Figure 10.2. Redfish in Divs. 3LN: mean standardized survey biomass from the Canadian and EU-Spain RV surveys. Indices were normalized to its mean of 2003-2019.

Recruitment

Recruitment (abundance 15-20 cm) has been below the long-term average since the mid-2010s in all surveys, with the exception of the 2023 EU-Spain survey in 3L (Figure 10.3).

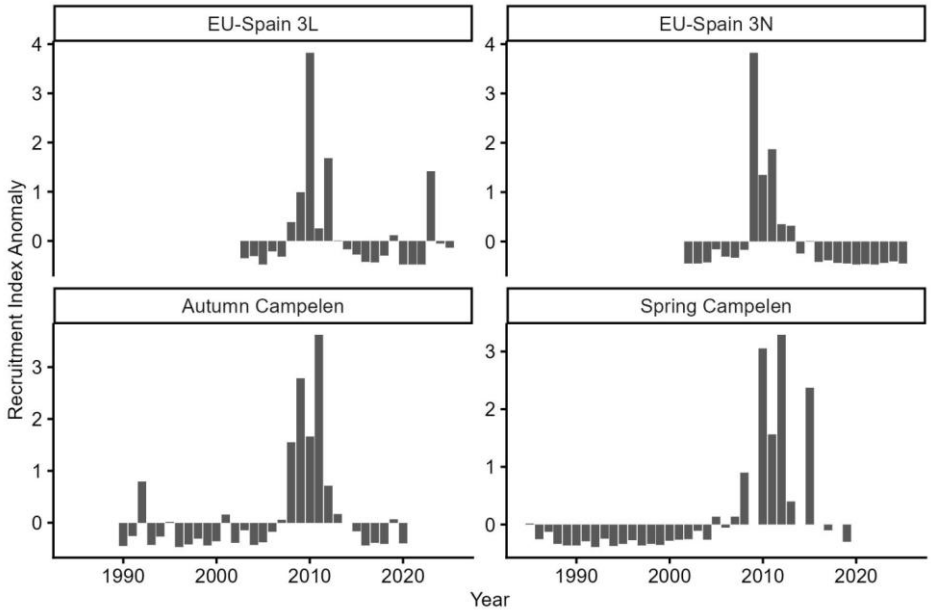


Figure 10.3. Redfish in Divs. 3LN: Recruitment index anomalies (15-20cm) from the Canadian and EU-Spain RV surveys.

d) Assessment results

No analytical assessment was performed.

Biomass: A combined mean standardized survey biomass was calculated based on the indices from the 3L and 3N EU-Spain, autumn Campelen and spring Campelen Canadian surveys (Figure 10.4). The uncertainty estimates take into account the number of surveys available in any given year. The biomass has declined from time-series highs in the mid-2010s. The 2025 estimate is above the long-term average. There is a 19% risk of the stock being below B_{lim} in 2025.

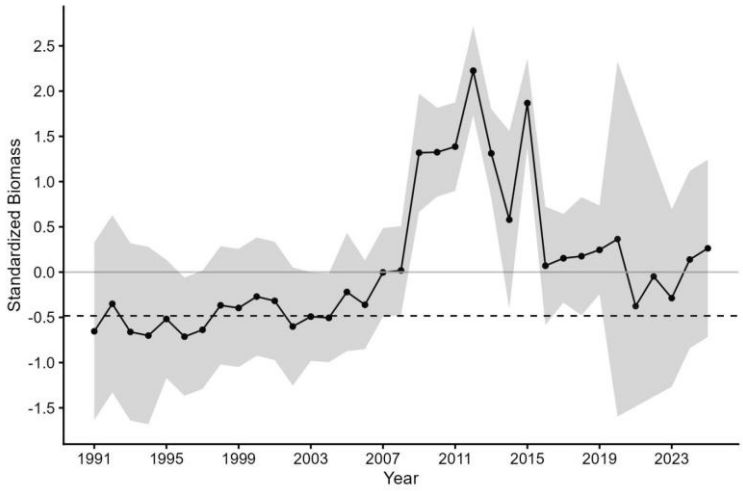


Figure 10.4. Redfish in Divs. 3LN: combined mean standardized survey biomass. Dashed line represents the average of the mean standardized survey biomass from 1991-2005 (B_{lim}) and the solid grey line is the time-series mean (1991-2025). The shaded area is the 95% confidence interval.

Fishing mortality: A fishing mortality proxy was derived as the ratio of the mean standardized catch to the combined mean standardized survey biomass, with values scaled between 0 and 1 (Figure 10.5). The F_{proxy} has declined and is relatively low in 2025.

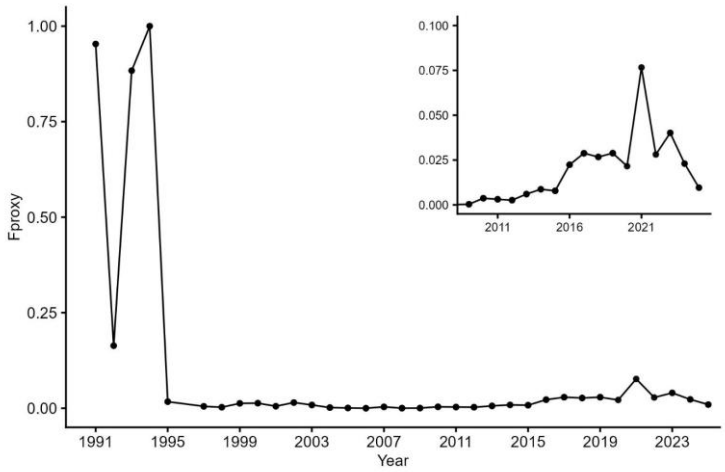


Figure 10.5. Redfish in Divs. 3LN: mean standardized catch/combined mean standardized survey biomass.

e) State of the stock

The stock has increased since 2023. There is a 19% risk of the stock being below B_{lim} in 2025. Recruitment (abundance 15-20 cm) has been below the long-term average since the mid-2010s in all surveys, with the exception of the 2023 EU-Spain survey in 3L. Relative fishing mortality has been decreasing in recent years, remaining well below the time series high seen in the early 1990s.

f) Reference points

A biomass limit reference point (B_{lim}) is based on the combined mean standardized survey biomass of 3N EU-Spain, Canadian autumn Campelen and spring Campelen surveys for the period 1991-2005. This period was chosen as it represented a time when stock biomass recovered from a prolonged low level.

g) Research recommendations

STACFIS **recommends** that *changes in maturity be explored for this stock*.

STACFIS **recommends** that *stock boundaries and definitions as well as synchronicity with adjacent stocks be explored for this stock*.

STACFIS **recommends** *considering combining the 3L and 3N EU-Spain indices*.

STACFIS **recommends** that *work continue to develop assessment models for this stock.*

In progress. SC reviewed a surplus production model (JABBA) but it was not accepted at this time.

The next full assessment for this stock will be in 2028.

11. American plaice (*Hippoglossoides platessoides*) in NAFO Divisions 3LNO

Interim Monitoring Report. SCR Docs. 21/025, 032, 035, 24/037, 25/027, 26/001, 002, 005; SCS Docs. 26/05, 06, 07, 10.

a) Introduction

American plaice supported large fisheries from the 1960s to the 1980s. However, due to the collapse of the stock in the early 1990s, there was no directed fishing in 1994 and a moratorium was put in place in 1995. Landings from by-catch increased until 2003, after which they began to decline. STACFIS agreed catches were 376 t in 2024 and 574 t in 2025 (Figure 11.1). Catch in 2025 was primarily taken as bycatch in EU-Portugal fisheries, the EU-Spain skate, and Canadian yellowtail flounder fisheries.

Commercial sampling (length, age) has been very low in recent years and is likely to be a challenge for age- and length-based analyses in future assessments.

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

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
TAC	ndf	ndf	ndf	ndf	ndf	ndf	ndf	ndf	ndf	ndf
Catch[1]	1.2	1.0	1.2	1.2	1.6	0.8	0.6	0.4	0.6	

ndf – No directed fishing.
[1]CESAG estimates

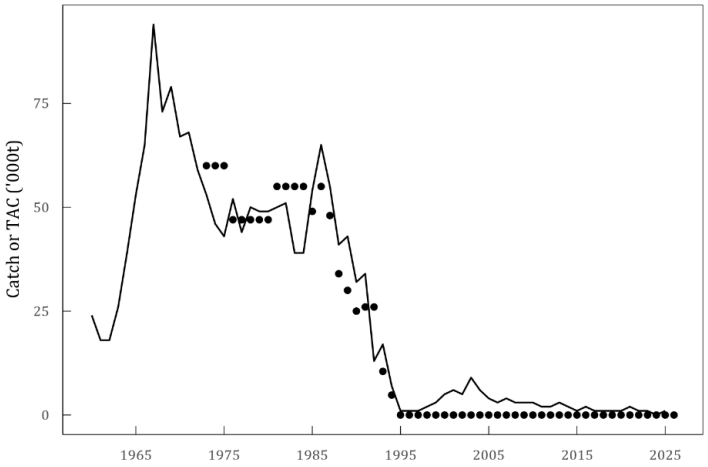


Figure 11.1. American plaice in Divs. 3LNO: TACs and estimated catches. No directed fishing is plotted as 0 TAC.

b) Research survey data

Multiple vessels have been used to complete the Canadian spring and autumn bottom trawl surveys. Comparative fishing for the Newfoundland and Labrador surveys was largely inconclusive for 3LNO American plaice due to limited sample size and/or poor spatial coverage. Indices presented here are in Campelen and Modified Campelen units, consistent with recommendations in SCR Doc. 25/027. However, assumptions of vessel comparability within and between series should be re-evaluated – including for size- and age-based indices – in the next assessment and/or benchmark process.

Canadian surveys have been undertaken at reduced set allocation since 2019. In 2025 the spring survey was completed with a minimum acceptable density, with most strata sampled with two sets. This increases uncertainty around indices for this stock.

Canadian spring survey. Due to coverage issues in the Canadian spring survey, indices are not available from 2006, 2015, 2017, 2020, 2021, and 2022.

Biomass and abundance estimates declined during the late 1980s-early 1990s. Biomass indices generally increased from the mid-1990s to 2014 but declined sharply after that (Fig. 11.2). The abundance index follows a similar trend. The 2024 and 2025 survey abundance and biomass indices are similar, both higher than the earlier points in the modified Campelen series.

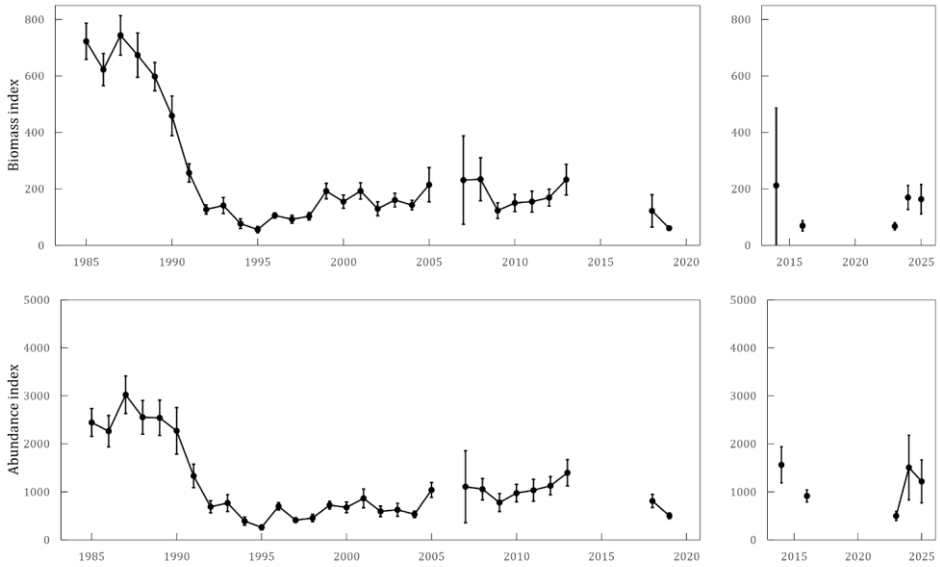


Figure 11.2. American plaice in Divs. 3LNO: biomass (top) and abundance (bottom) indices with approximate 95% confidence intervals from Canadian spring surveys during the Campelen series (left) and Modified Campelen (right).

Canadian autumn survey. Autumn survey points for 2004 and 2014 are excluded due to incomplete coverage of Div. 3L and Divs. 3NO, respectively. There was no autumn survey in Divs. 3LNO in 2021 or 2022. Biomass and abundance indices (Fig. 11.3) from the autumn survey declined rapidly from 1990 to the mid-1990s. Biomass has remained at a relatively low level since. There was an increase in abundance indices to 2013 but this trend did not persist. There has been a year-over-year increase in both abundance and biomass indices since 2023. However, these cannot be directly related to the earlier time series.

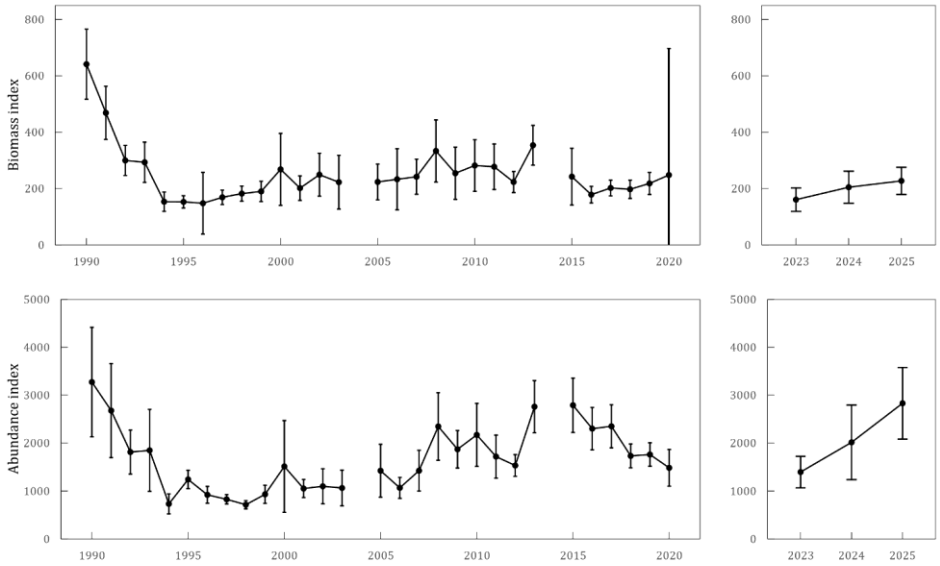


Figure 11.3. American plaice in Divs. 3LNO: biomass (top) and abundance (bottom) indices with approximate 95% confidence intervals from Canadian autumn surveys. In the first panel (left), data prior to 1996 are Campelen equivalents and since then are Campelen. In the second panel (right), data are modified Campelen units.

EU-Spain Divs. 3NO Survey. From 1998-2025, surveys have been conducted annually by EU-Spain in the Regulatory Area in Divs. 3NO. There was no survey in 3NO in 2020. The biomass and abundance indices varied without trend for most of the time series but then subsequently declined and have remained low since 2016 (Fig. 11.4).

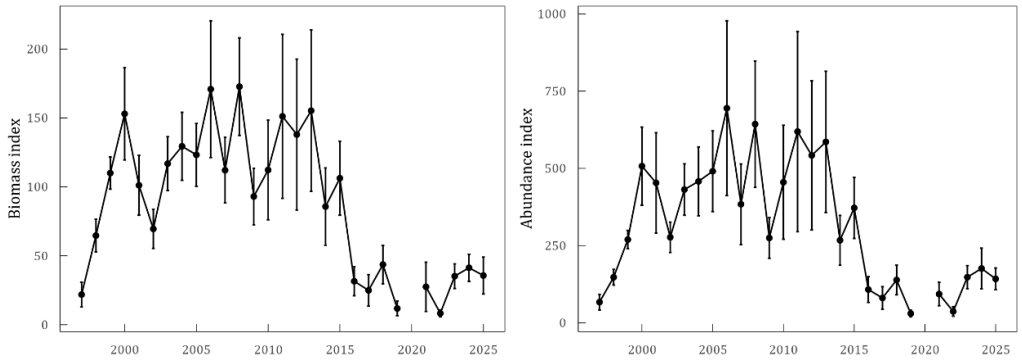


Figure 11.4. American plaice in Divs. 3LNO: biomass (left) and abundance (right) (+/- 2SD) from the EU-Spain Divs. 3NO survey (data prior to 2001 are Campelen equivalents and since then are Campelen).

EU-Spain Div. 3L Survey. Since 2003 surveys have been conducted annually by EU-Spain in the Regulatory Area in Div. 3L. Surveys in 3L were not completed in 2005 or 2020 to 2022. The biomass and abundance indices increased from 2010 to 2015, and subsequently declined to 2019. Biomass indices were relatively stable from 2023 to 2025 at a moderate level, while abundance has been consistently in the last three surveys (Figure 11.5)

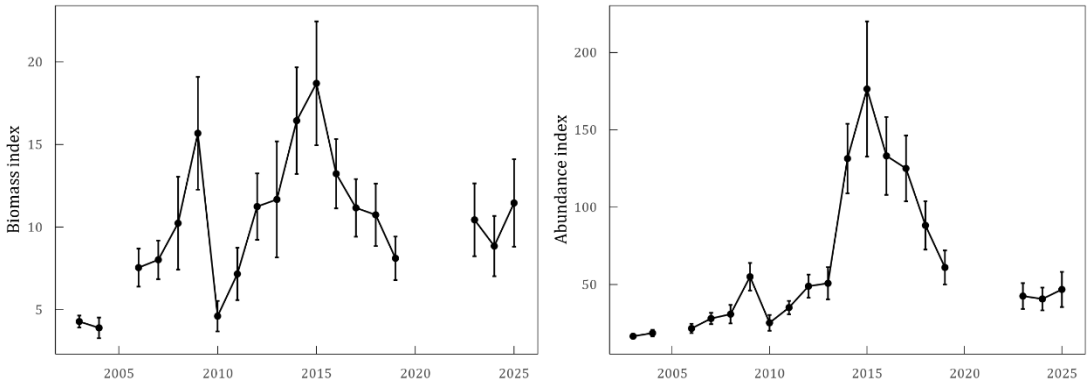


Figure 11.5. American plaice in Divs. 3LNO: biomass (left) and abundance (right) indices (+/- 2SD) from the EU-Spain Div. 3L survey.

c) Conclusion

The most recent Canadian surveys cannot be directly compared to previous series due to a lack of conversion factors. However, given the overall scale of recent Canadian indices and continued low levels of American plaice reported in the EU-Spain surveys there is nothing to indicate a change in the status of the stock since the 2021 assessment.

d) Research recommendations

STACFIS reiterates the **recommendation** that *a benchmark be undertaken for this stock, including investigations be undertaken to reexamine which survey indices are included in the model.*

STACFIS **recommends** that *investigations be undertaken to examine the impact of past vessel mixing in the Canadian surveys on length- and age-based indices.*

STACFIS **recommends** that *investigations be undertaken to compare ages obtained by current and former Canadian age readers.*

STATUS: Work is ongoing. This recommendation is reiterated.

There will be no new assessment until monitoring shows that conditions have changed or a benchmark process has been completed.

12. Yellowtail Flounder (*Myzopsetta ferruginea*) in Divisions 3L, 3N and 3O

Interim Monitoring Report. SCR Docs. 25/026, 26/001, 002; SCS Docs. 26/06, 07, 10.

a) Introduction

A moratorium on directed fishing was put in place during 1994, and from 1995 to 1997 the TAC was set at zero. During this time, small catches were taken as by-catch in other fisheries. The fishery was re-opened in 1998 and catches increased from 4 400 t to 14 100 t in 2001 (Fig 12.1). Catches from 2001 to 2005 ranged from 11 000 t to 14 000 t. Since 2006 catches have remained below the TAC, attributed primarily to industry related factors. Since 2023, catches have averaged near 3 300 t.

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

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
TAC	17	17	17	17	17	20	20	15.6	15.8	24.3
Catches[1]	9.2	8.7	12.8	14.8	14.6	10.6	3.2	3.0	3.6	

[1] CESAG estimates

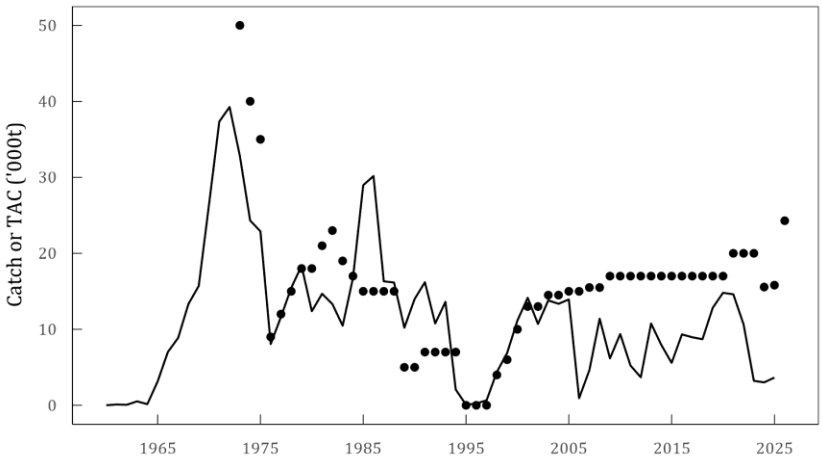


Figure 12.1. Yellowtail flounder in Divs. 3LNO: TACs (points) and estimated catches (line). No directed fishing is plotted as 0 TAC.

b) Data overview

i) Research survey data

Multiple vessels have been used to complete the Canadian spring and autumn bottom trawl surveys. For yellowtail flounder in NAFO Divs. 3LNO, conversion factors are applied, allowing data from these vessels to be used together across the time series.

Canadian surveys have been undertaken at reduced set allocation since 2019. In 2025 the spring survey was completed with a minimum acceptable density, with most strata sampled with two sets. This increases uncertainty around indices for this stock.

Canadian spring survey. Biomass and abundance indices declined from the start of the series in 1985 to the mid-1990s. There was then a steady increase to the early 2000s after which indices varied at a high level to 2014. There was no survey in 2015. Indices showed a decline to 2016 and for a few years remained at a level near that observed in the late-1990s (Fig. 12.2). Surveys in 2020 and 2021 were once again incomplete making it difficult to interpret recent trends, though indices since 2022 are moderately high.

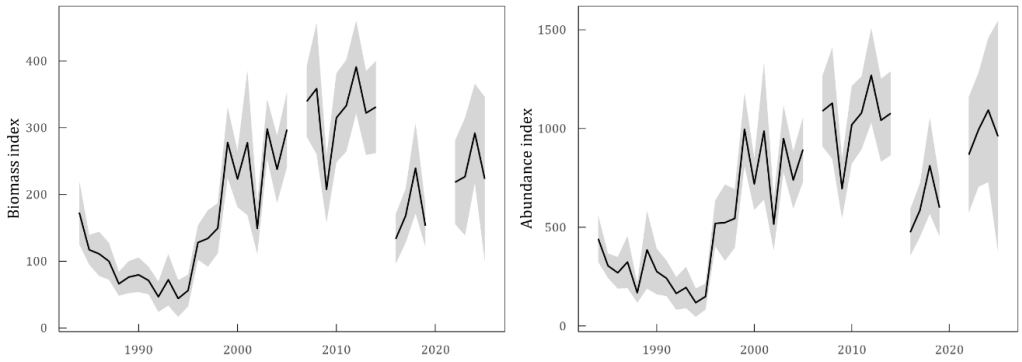


Figure 12.2. Yellowtail flounder in Divs. 3LNO: indices of biomass (left) and abundance (right) with approximate 95% confidence intervals from Canadian spring surveys.

Canadian autumn survey. The autumn survey biomass and abundance indices increased steadily from the early-1990s to 2001, and although variable, it was relatively high to the early-2010s. A slight decreasing trend is apparent in biomass to around 2020 (Fig. 12.3). The survey was incomplete in 2021 and 2022. Indices since have been fairly stable.

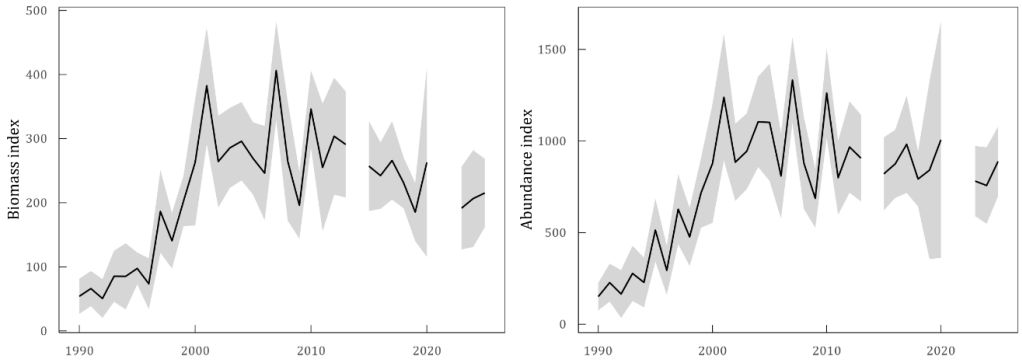


Figure 12.3. Yellowtail flounder in Divs. 3LNO: indices of biomass (left) and abundance (right) with approximate 95% confidence intervals from Canadian autumn surveys.

EU-Spain Divs. 3NO survey. The biomass and abundance indices of yellowtail flounder increased sharply from the start of the series in 1995 to 1999, after which they remained relatively stable at a high level until 2013. Indices then declined to 2022, reaching the second lowest in value the time series. This low did not persist, with indices increasing since then (Fig. 12.4). Trends are in general agreement with the Canadian series; however, the decline to the early 2020s was of a higher magnitude in the EU-Spain survey. No survey was carried out in 2020.

There has also been a stratified-random trawl survey in the Regulatory Area of Div. 3L since 2003, however yellowtail flounder have never been caught in this survey.

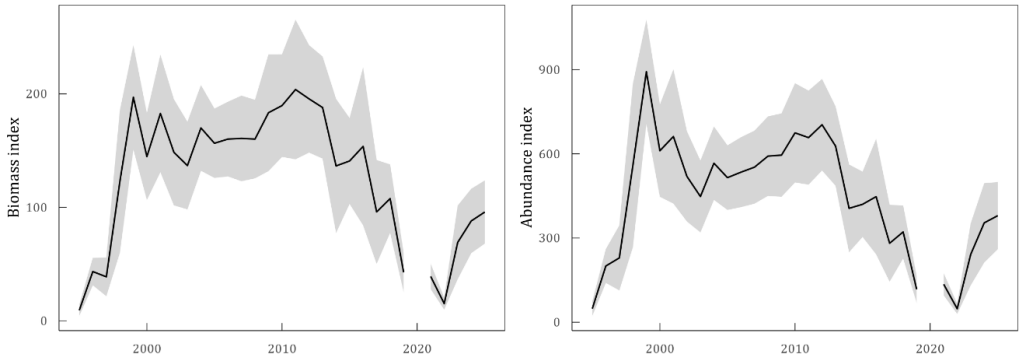


Figure 12.4. Yellowtail flounder in Divs. 3LNO: indices of biomass (left) and abundance (right) from the EU-Spain spring surveys in the Regulatory Area of Divs. 3NO ±2SD.

c) Conclusion

The most recent analytical assessment (SCR Doc. 25/025) using a Bayesian stock production model concluded that the stock size was in the Healthy Zone, with projections indicating a high probability of remaining above $B_{trigger}$. Overall, the 2025 survey indices do not suggest a change in the status of the stock.

The next full assessment of this stock is planned for 2027.

13. Witch Flounder (*Glyptocephalus cynoglossus*) in Divisions 3N and 3O

Full assessment. SCR Docs. 26/XXX, 002, 001; SCS Docs. 26/05, 06, 07, 10.

a) Introduction

From 1972 to 1993, reported catch of witch flounder in NAFO Divs. 3NO ranged between 2 400 t and 9 200 t before declining sharply in 1994 (Figure 13.1). A moratorium on directed fishing was imposed in 1995 and was

lifted in 2015, during which period bycatch was less than 500 t. Catches have remained well below the TAC since the moratorium was lifted. In 2025, the total estimated catch was 250 t.

Table 13.1. Recent catches and TACs ('000 t) of witch flounder in NAFO Divs. 3NO.

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
TAC	2.2	1.1	1.2	1.2	1.2	1.2	1.3	1.4	1.4	1.5
Catch[1]	0.7	0.7	0.9	0.7	0.6	0.6	0.3	0.2	0.3	

[1] CESAG estimates

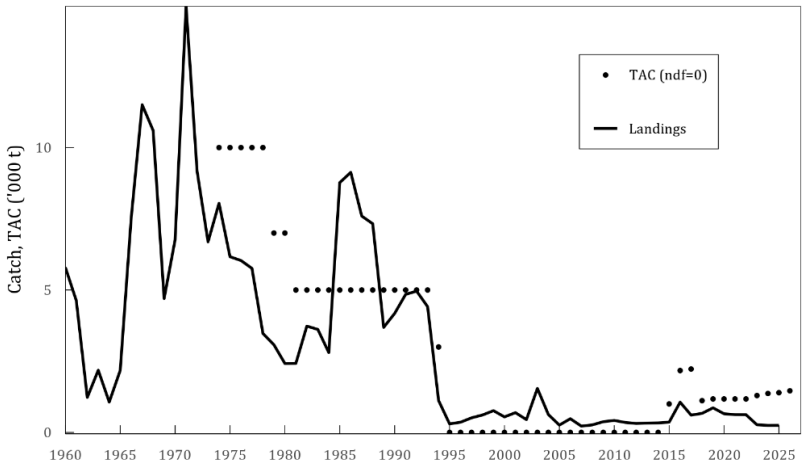


Figure 13.1. Witch flounder in Divs. 3NO: TAC (points) and estimated catches (line).

b) Data overview

i) Research survey data

Multiple vessels have been used to complete the Canadian spring and autumn bottom trawl surveys. Comparative fishing for the Newfoundland and Labrador surveys was largely inconclusive for Divs. 3NO witch flounder due to limited sample size and/or poor spatial coverage. Indices presented here are in Campelen and Modified Campelen units, consistent with recommendations in SCR Doc. 25/027.

Canadian surveys have been undertaken at reduced set allocation since 2019. In 2025 the spring survey was completed with a minimum acceptable density, with most strata sampled with two sets. This increases uncertainty around indices for this stock.

Canadian Stratified-Random Spring RV Surveys

Spring Campelen RV Survey. The spring Campelen biomass index (Figure 13.2), although variable, had shown a general decreasing trend from 1985 to 1998, a general increasing trend from 1998 to 2003, and a general decreasing trend from 2003 to 2010. It increased to near the time-series high in 2013. Biomass declined substantially in 2015 and remained relatively stable from 2015 to 2019. Data were not available for 2006, 2020 and 2021. Spring Campelen RV surveys in 2014, 2016, 2018, and 2022 onwards utilized different vessels and/or modified survey gear and those data are not comparable to this series due to lack of conversion factors.

Spring Modified Campelen RV Survey. Biomass estimates from the spring modified Campelen series (Figure 13.2) have remained near the long-term series mean, but with wide error bars in some years.

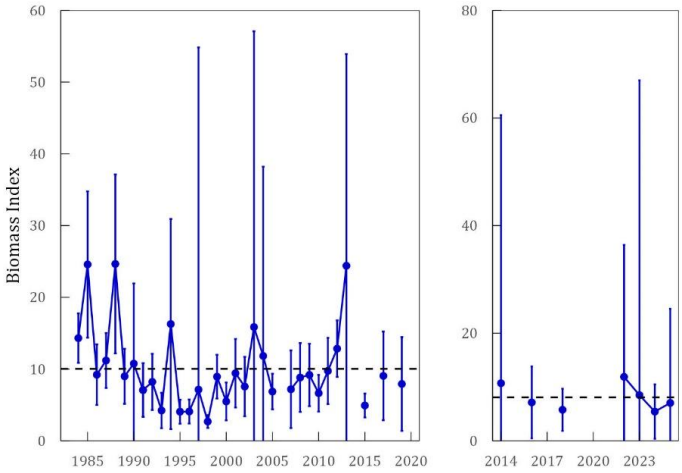


Figure 13.2. Witch flounder in Divs. 3NO: Left – survey biomass indices from Canadian Campelen spring surveys 1984-2019, and right – survey biomass indices from Canadian modified Campelen spring surveys up to 2025 (includes CCGS Teleost data from 2014, 2016 and 2018). Vertical lines indicate 95% confidence limits, and the dashed line is the long term series mean.

Canadian Stratified-Random Autumn RV Surveys

Autumn Campelen RV Surveys. The autumn Campelen biomass index (Figure 13.3) showed a general increasing trend until 2009 but declined to near the time series mean afterwards. Data were not available for 2014 or 2021 as surveys were incomplete, and data from 2022 onwards utilized modified survey gear which are not comparable to this series due to lack of conversion factors.

Autumn Modified Campelen RV Surveys. Biomass point estimates from the autumn modified Campelen series (Figure 13.3) have declined from 2023 to 2025. Data were not available for 2022 as there was no survey in this year.

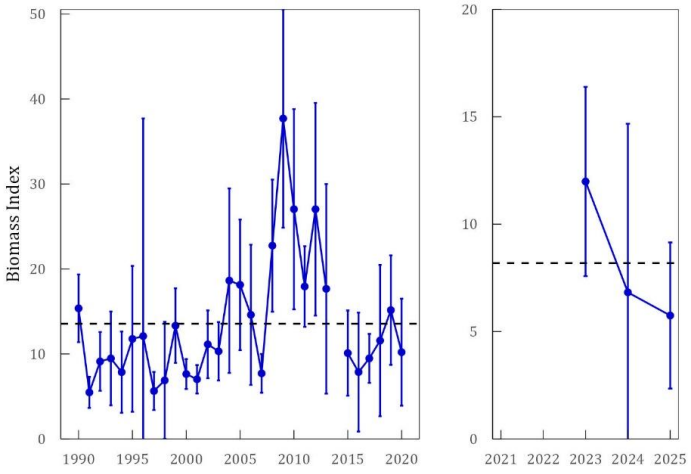


Figure 13.3. Witch flounder in Divs. 3NO: Left – survey biomass indices from Canadian Campelen autumn surveys 1990-2020, and right – survey biomass indices from Canadian modified Campelen autumn surveys 2023-2025. Vertical lines indicate 95% confidence limits, and the dashed line is the long term series mean.

EU-Spain RV Spring Survey.

Surveys have been conducted annually from 1995 to 2025 by EU-Spain (SCR Doc. 26/001) in the NAFO Regulatory Area in Div. 3NO to a maximum depth of 1 450 m (since 1998). The Campelen biomass index (Figure 13.4) has demonstrated a general decreasing trend since 2001 but increased from 2022 to 2025. There was no survey in 2020 and data prior to 2001 utilized a different vessel and survey gear which are not comparable to the Campelen series due to a lack of conversion factors.

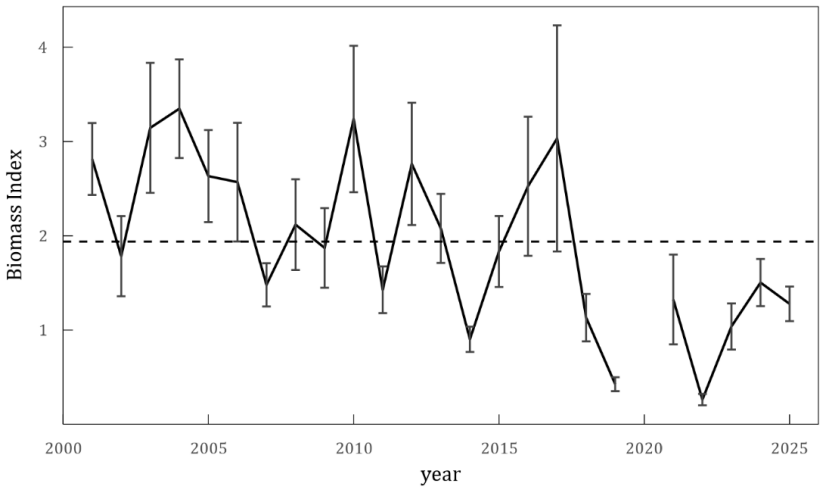


Figure 13.4. Witch flounder in Divs. 3NO: biomass indices from EU-Spanish Divs. 3NO spring surveys 2001-2025 (± 1 standard deviation). Only Campelen units are shown. The dashed line is the long term series mean

Survey Abundance Indices at Length

Length frequencies from 2008-2014 had a mode generally around 40 cm (Figure 13.5). From 2015 to 2019, fish at the 30-50 cm were less prominent than those seen in 2008 to 2014 and the EU-Spain, spring modified Campelen and autumn modified Campelen series indicate that this size range remains prominent.

There were a number of distinctive peaks of recruitment size classes in surveys that were evident and could be followed through successive years. In particular, a distinctive recruitment peak in the 10 cm range was evident in the 2017 Canadian autumn RV survey (Figure 13.5). Growth of this peak can be tracked through both Canadian spring and autumn surveys, and in 2019 these fish appear in a mode in the 21-26 cm range. Another strong peak of fish at about 5 cm is observed in the 2019 spring Canadian survey which is evident at 7-10 cm in size in the Canadian autumn survey. While not comparable to the spring or autumn Campelen survey series, there are recruitment pulses evident in the autumn modified Campelen survey in 2023 and the spring modified Campelen survey in 2025. There are no signals of recruitment pulses in the EU-Spain survey in recent years.

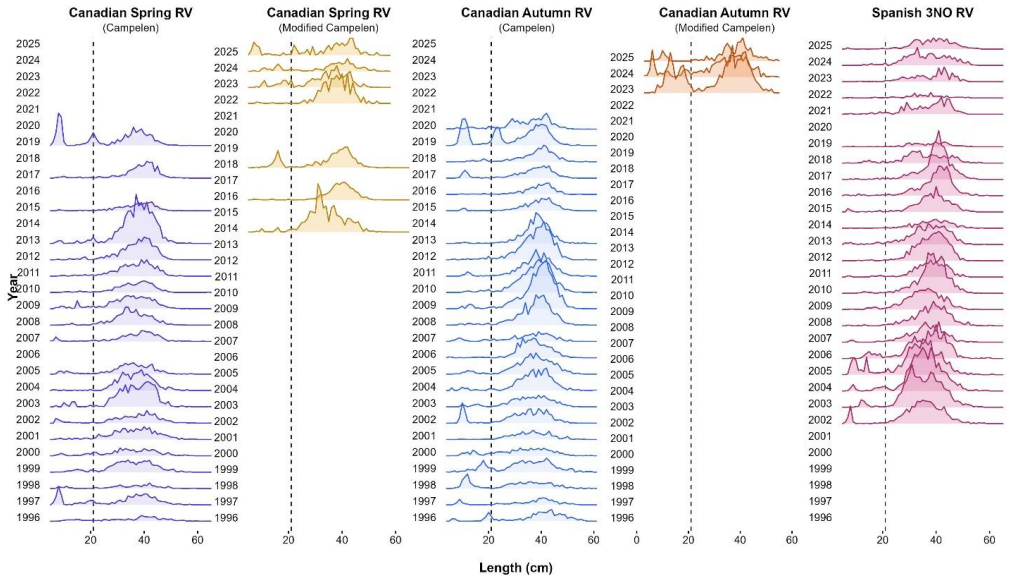


Figure 13.5. Witch flounder in Divs. 3NO: Length frequencies (abundance at length) of witch flounder from Canadian spring Campelen, spring modified Campelen, autumn Campelen, autumn modified Campelen and EU-Spanish surveys of Divs. 3NO. Vertical line represents the length at which fish are expected to be recruited to the population (21 cm).

Distribution

Analysis of distribution data from the surveys show that this stock is mainly distributed in Div. 3O along the southwestern slopes of the Grand Bank.

ii) Recruitment

With the exception of the growth of the stock following improved recruitment in the late 1990s, it is unclear if the recruitment index (survey number of fish<21 cm; Figure 13.6) is representative. Nevertheless, the recruitment indices in 2005 and 2019 were the highest in the time series. The small fish during the 2019 survey did not appear in the 2020 Canadian autumn survey, however, and the recruitment index was again below average. The number of small fish in the spring Canadian modified Campelen survey has been above average since 2023 while it has declined in the autumn modified Campelen survey from 2023-2025, however Divs. 3NO witch flounder data from these surveys are not comparable to the previous Campelen series. The recruitment index from the EU-Spain survey has been below the series mean since 2007.

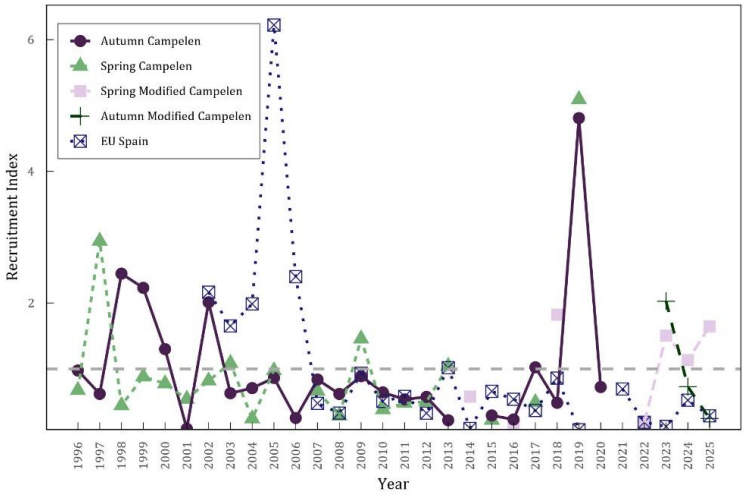


Figure 13.6. Witch flounder in Divs. 3NO: Recruitment indices of witch flounder (<21 cm) from spring and autumn Canadian RV surveys (Campelen and Modified Campelen indices), and the EU-Spain RV spring survey. Recruitment indices are standardized to the mean of each series and the dashed line is the long term series mean

c) Estimation of parameters

A Schaefer surplus production model in a Bayesian framework was used for the assessment of this stock. The input data were catch from 1960-2025, Canadian spring Campelen survey series from 1984-1990 (Engels trawl data converted to Campelen units), Canadian Campelen spring survey series from 1991-2019 (no 2006, 2014, 2016, or 2018), Canadian autumn Campelen survey series from 1990-2020 (no 2014 or 2021), Canadian spring modified Campelen series 2014, 2016, 2018, 2022-2025 and Canadian autumn modified Campelen series 2023-2025 (no 2022). The model formulation was identical to the accepted formulation from the 2024 assessment (SCR Doc. 24/018).

The priors used in the model were:

	Type of prior	Values
Median initial population size (relative to carrying capacity)	uniform(lower limit, upper limit)	Pin~dunif(0.5, 1)
Intrinsic rate of natural increase	lognormal (mean, precision)	r ~ dlnorm(-1.763,3.252)
Carrying capacity	lognormal (mean, precision)	K~dlnorm(4.562,11.6)
Survey catchability	gamma(shape, rate)	q =1/pq pq ~dgamma(1,1)
Process error (sigma=standard deviation of process error in log-scale)	uniform(lower limit, upper limit)	For 1960-2013 and 2017-2025 sigma ~ dunif(0,10) precision:isigma2= $sigma^{-2}$ For 2014-2016 sigmadev <-sigma+1 precision: isigmadev2=$sigmadev^{-2}$
Observation error (tau=variance of observation error in log-scale)	gamma(shape, rate)	tau~dgamma(1,1) precision:itau2 = 1/tau

d) Assessment results

Bayesian Stock production Model

The surplus production model results indicate that stock size decreased from the highs in the late 1960s. The model estimates that a maximum sustainable yield (*MSY*) of 3 607 t (3 113 t – 4 136 t) can be produced by total stock biomass (B_{msy}) of 60 271 t (51 089 t – 68 891 t) at a fishing mortality rate (F_{msy}) of 0.060 (0.050-0.072).

Biomass

The analysis showed that relative population size (median B/B_{msy}) was below B_{lim} *(30%*B_{msy}*)* from 1992-2001 and 2015-2019 (Figure 13.7). Relative biomass has been increasing since 2015. Biomass at the beginning of 2026 is 37% of B_{msy} with a probability of being below B_{lim} of 28%.

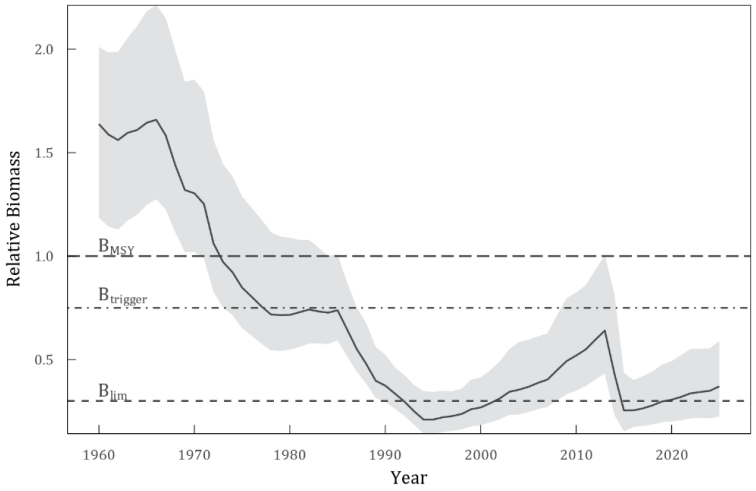


Figure 13.7. Witch flounder in Divs. 3NO: Median relative biomass ($Biomass/B_{msy}$) with 80% credible intervals from 1960-2025. The horizontal lines are B_{lim} = 30% B_{msy} (short-dashed), $B_{trigger}$ = 75% B_{msy} (dot and dashed line) and B_{msy} (long-dashed).

Fishing Mortality

Relative fishing mortality rate (median F/F_{msy}) was mostly above 1.0 from the mid 1960s to the mid-1990s (Figure 13.8). With the exception of 2003 and 2016, F has been below F_{msy} since the moratorium implemented in 1995. Median F was estimated to be 19% of F_{msy} with a low probability (<1%) of exceeding it in 2025.

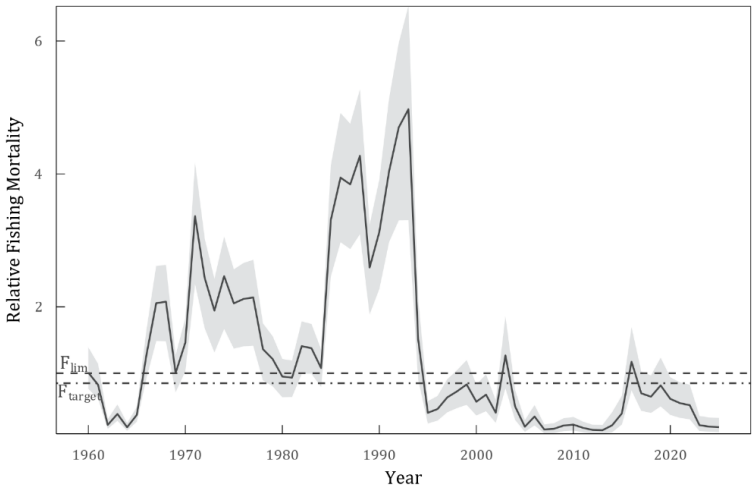


Figure 13.8. Witch flounder in Divs. 3NO: Median relative fishing mortality (F/F_{msy}) with 80% credible intervals from 1960-2025. The horizontal lines are F_{target} = 85% F_{msy} (dot and dashed line) and F_{lim} = F_{msy} short-dashed).

e) State of the stock

The stock is in the Cautious Zone. The stock has increased slightly since 2015 and is estimated at 37% B_{msy}. There is a very high risk (>99%) of the stock being below $B_{trigger}$ and a very low risk (<1%) of F being above F_{lim}=F_{msy} or $F_{trigger}$. There is a 28% risk of the stock being below B_{lim}. Recent recruitment appears to be average.

f) Stock projections

Stochastic projections were conducted under two catch scenarios for 2026: $Catch_{2026}$ = TAC_{2026} (1 461 t) and $Catch_{2026}$ = Average catch from 2023-2025 (255 t). As per the NAFO PA for stocks in the Cautious Zone, fishing mortality was applied along the lower edge, midrib and upper edge leaf. Projections were also conducted for F=0. F options with median yield and projected relative biomass are presented in Table 13.2. Levels of risk under the two catch scenarios are presented in Table 13.3. Biomass and yield projections are displayed in Figure 13.9 and projections on the PA leaf are shown in Figure 13.10.

There is a high annual probability (93–97%) of the stock remaining in the Cautious Zone from 2027 to 2028 for both catch scenarios under the PA leaf. There remains an annual probability of 14–20% of being in the Critical Zone under the catch=TAC scenario and 11–16% under the average catch scenario from 2027 to 2028 under the PA leaf. With the exception of 2026 under the catch=TAC scenario (52% risk of F exceeding F_{MSY} in 2026), fishing mortality is projected to remain low if the F values along the PA leaf are adhered to. Projections show a high probability (>99%) that the stock will grow from 2026 to 2029 under both catch scenarios.

Table 13.2. Witch flounder in Divs. 3NO: Medium-term projections for witch flounder in Divs. 3NO under two scenarios: catch in 2026=TAC (1 461 t) and catch in 2026=average catch 2023-2025 (255 t). Projected yield ('000 t) and the median with 10th and 90th percentiles of start of year relative biomass (B/B_{msy}) are shown for F=0 and projected F values under the NAFO PA Leaf (lower, mid and upper) for stocks in the cautious zone.

Catch 2026 = 1 461 t (TAC)			
Year	F	Yield ('000t) Median	Start of year relative Biomass (B/B_{msy}) Median (80% CI)
F = 0			
2026	0.060	1.461	0.40 (0.24, 0.60)
2027	0	0	0.42 (0.25, 0.63)
2028	0	0	0.46 (0.27, 0.69)
2029	-	-	0.50 (0.30, 0.74)
Lower Edge Leaf			
2026	0.060	1.461	0.40 (0.24, 0.60)
2027	0.005	0.131	0.42 (0.25, 0.63)
2028	0.007	0.205	0.45 (0.27, 0.67)
2029	-	-	0.49 (0.30, 0.71)
Midrib Leaf			
2026	0.060	1.461	0.40 (0.24, 0.60)
2027	0.013	0.326	0.42 (0.25, 0.63)
2028	0.017	0.461	0.45 (0.27, 0.66)
2029	-	-	0.49 (0.30, 0.69)
Upper Edge Leaf			
2026	0.060	1.461	0.40 (0.24, 0.60)
2027	0.026	0.647	0.42 (0.25, 0.63)
2028	0.030	0.801	0.45 (0.27, 0.66)
2029	-	-	0.47 (0.30, 0.68)

Catch 2026 = 255 t (Average Catch 2023-2025)			
Year	F	Yield ('000t) Median	Start of year relative Biomass (B/B_{msy}) Median (80% CI)
F = 0			
2026	0.010	0.255	0.40 (0.24, 0.60)
2027	0	0	0.44 (0.27, 0.65)
2028	0	0	0.48 (0.29 0.71)
2029	-	-	0.52 (0.33, 0.77)
Lower Edge Leaf			
2026	0.011	0.255	0.40 (0.24, 0.60)
2027	0.006	0.168	0.44 (0.27, 0.65)
2028	0.009	0.253	0.47 (0.29, 0.69)
2029	-	-	0.51 (0.33, 0.72)
Midrib Leaf			
2026	0.011	0.255	0.40 (0.24, 0.60)
2027	0.015	0.401	0.44 (0.26, 0.65)
2028	0.019	0.546	0.47 (0.29. 0.68)
2029	-	-	0.51 (0.33, 0.71)
Upper Edge Leaf			
2026	0.011	0.255	0.40 (0.24, 0.60)
2027	0.029	0.751	0.44 (0.27, 0.65)
2028	0.032	0.902	0.47 (0.29, 0.68)
2029	-	-	0.49 (0.33, 0.70)

Table 13.3. Witch flounder in Divs. 3NO: Projected yield (t) and the risk (%) of $F>F_{lim}$, $B<B_{lim}$, $F>F_{target}$ and $B<B_{trigger}$, and probability of stock growth ($B_{2029}>B_{2026}$) for F=0, and projected F values under the NAFO PA Leaf (lower edge leaf, midrib leaf and upper edge leaf) for stocks in the Cautious Zone. Two scenarios are shown: catch in 2026 = TAC (1 461 t) and catch in 2026 = average catch 2023-2025 (255 t).

Catch 2026 = 1 461 t (TAC)					
Cautious Zone		F = 0	F lower edge leaf	F mid rib leaf	F upper edge leaf
Yield ('000t) (50%)	2026	1 461 t	1 461 t	1 461 t	1 461 t
	2027	0 t	131 t	326 t	647 t
	2028	0 t	205 t	461 t	801 t
$P(F>F_{lim})$	2026	52%	52%	52%	52%
	2027	<1%	<1%	<1%	<1%
	2028	<1%	<1%	<1%	<1%
$P(B<B_{lim})$	2026	22%	22%	22%	22%
	2027	20%	20%	20%	20%
	2028	14%	14%	14%	14%
	2029	10%	10%	10%	10%
$P(F>F_{target})$	2026	70%	70%	70%	70%
	2027	<1%	<1%	<1%	<1%
	2028	<1%	<1%	<1%	<1%
$P(B<B_{trigger})$	2026	98%	98%	98%	98%
	2027	97%	97%	97%	97%
	2028	94%	96%	96%	96%
	2029	90%	94%	94%	95%
$P(B_{2029}>B_{2026})$		>99 %	>99%	>99 %	>99%
$(B_{2029}-B_{2026})/B_{2026}$		23%	20%	19%	17%

Catch 2026 = 255 t (Average Catch 2023-2025)					
Cautious Zone		F = 0	F lower edge leaf	F midrib leaf	F upper edge leaf
Yield ('000t) (50%)	2026	255 t	255 t	255 t	255 t
	2027	0 t	168 t	401 t	751 t
	2028	0 t	253 t	546 t	902 t
$P(F>F_{lim})$	2026	<1%	<1%	<1%	<1%
	2027	<1%	<1%	<1%	<1%
	2028	<1%	<1%	<1%	<1%
$P(B<B_{lim})$	2026	22%	22%	22%	22%
	2027	16%	16%	16%	16%
	2028	11%	11%	11%	11%
	2029	7%	7%	7%	7%
$P(F>F_{target})$	2026	<1%	<1%	<1%	<1%
	2027	<1%	<1%	<1%	<1%
	2028	<1%	<1%	<1%	<1%
$P(B<B_{trigger})$	2026	98%	98%	98%	98%
	2027	96%	96%	96%	96%
	2028	93%	94%	95%	95%
	2029	89%	93%	93%	94%
$P(B_{2029}>B_{2026})$		>99 %	>99%	>99%	>99%
$(B_{2029}-B_{2026})/B_{2026}$		29%	26%	24%	22%

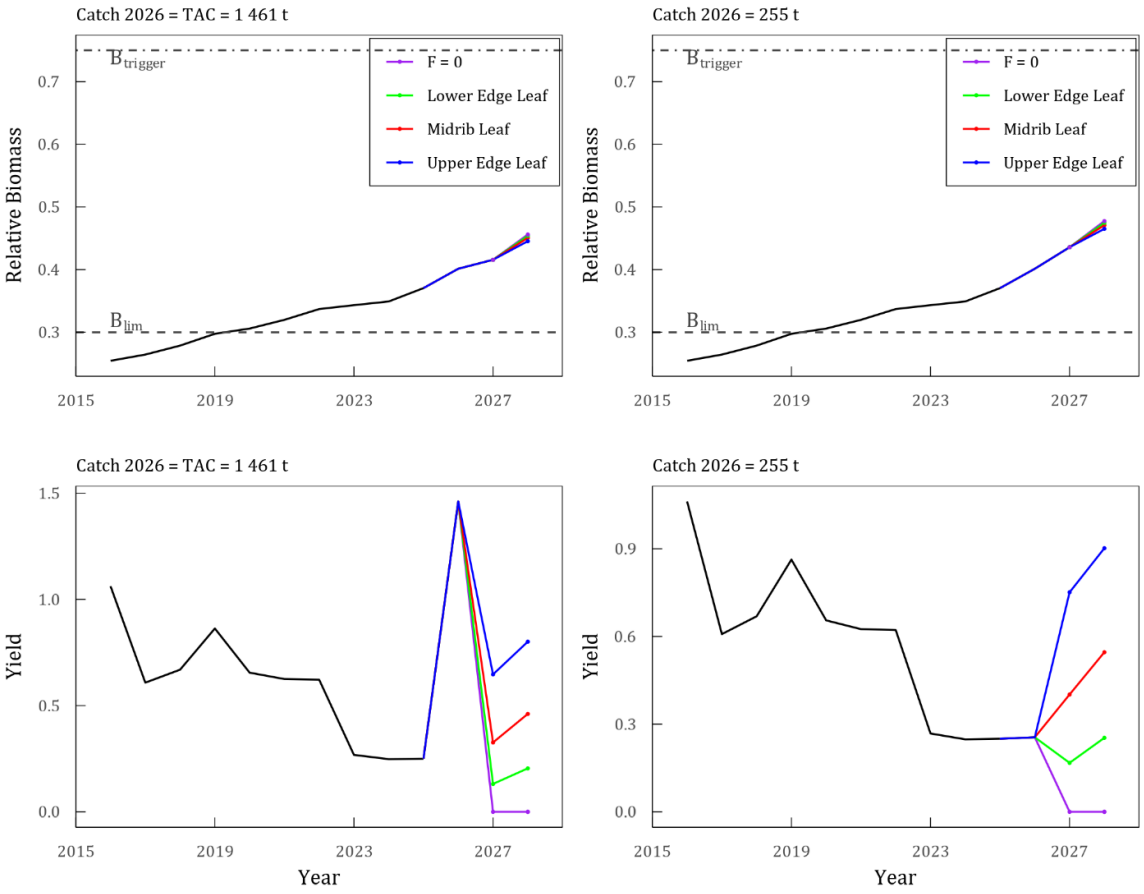


Figure 13.9. Witch flounder in Divs. 3NO: Relative biomass (top) and yield (bottom) resulting from stochastic projections for 2027-beginning 2029 at F=0 and three levels of F defined by the NAFO PA leaf in the Cautious Zone. Projections were done under two catch scenarios (2026 TAC on the left and average catch from 2023-2025 on the right).

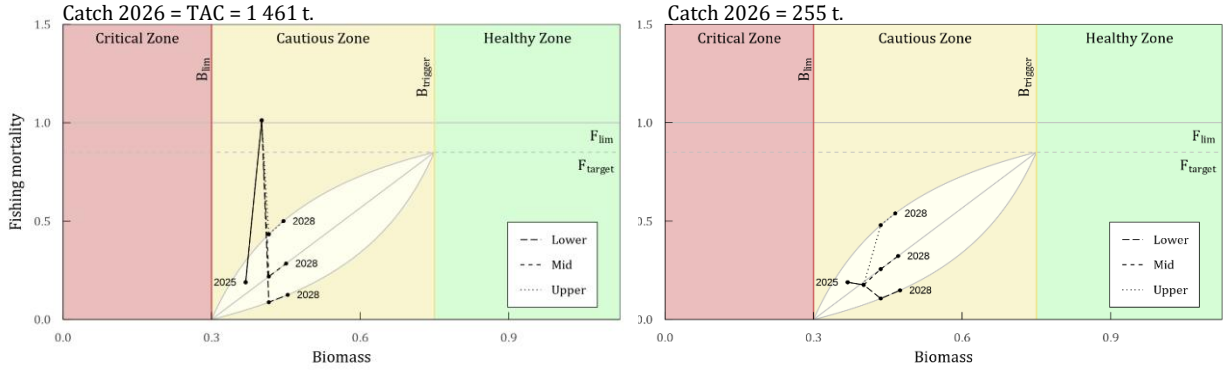


Figure 13.10. Witch flounder in Divs. 3NO: Stochastic projections in the NAFO PA Framework from 2026-2028 under two scenarios; 2026 catch = 2026 TAC on the left, and 2026 catch = average catch 2023-2025 on the right.

g) Reference points

Establishment of the NAFO PA Framework since the 2024 assessment led to $B_{trigger}$ and F_{target} reference points being defined for this stock. B_{lim} is defined at 30% B_{msy}, $B_{trigger}$ is defined at 0.75B_{msy}, F_{lim} is defined at F_{msy}, and F_{target} is defined at 0.85F_{msy}. The Divs. 3NO witch flounder stock is currently in the Cautious Zone of the NAFO

PA Framework, with a 28% probability of being in the Critical Zone. There is a very high probability that *F* is below F_{lim} and F_{target}. In 2025, the median F and biomass estimates are within the leaf of the PA Framework.

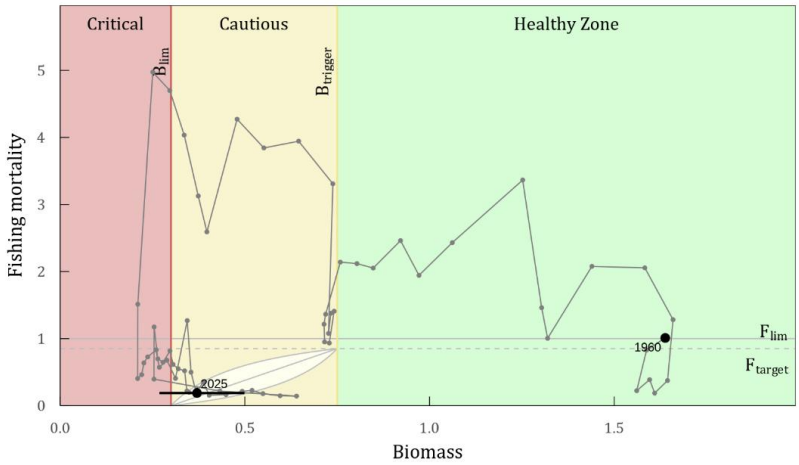


Figure 13.11. Witch flounder in Divs. 3NO: Stock trajectory estimated from the surplus production model, under the Precautionary Approach Framework (80% credible intervals on the 2025 estimate).

h) Research recommendations

STACFIS **recommend**s that *the Bayesian production model for this assessment be further explored in order to determine if adding the EU-Spain spring survey series (Pedreira and Campelen, either separately or if conversion is possible, a single time series) could be included as model inputs.*

While this was attempted, more time is required to investigate the impacts on the model convergence and outputs because of incorporating some of the EU-Spain survey data.

The next full assessment of this stock will be in 2028.

14. Capelin (*Mallotus villosus*) in Divisions 3NO

Interim Monitoring Report. SCR Doc. 26/001; SCS Docs. 26/06, 07.

a) Fisheries and Catches

The fishery for capelin in Divs. 3NO started in 1971 and catches were high in the mid-1970s with a maximum catch of 132 000 t in 1975 (Fig. 14.1). The stock has been under a moratorium to directed fishing since 1992. No catches were reported from 1993 to 2013. A catch of 1 t was recorded in 2014, followed by a zero catch in 2015. Small catches (mostly discards) occurred from 2016 to 2025.

Recent TACs and catches (t) are as follows:

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
TAC	ndf	ndf	ndf	ndf	ndf	ndf	ndf	ndf	ndf	ndf
Catches[1]	1	2	2	1	0	7	3	5	8	

ndf = no directed fishery
[1] CESAG estimates

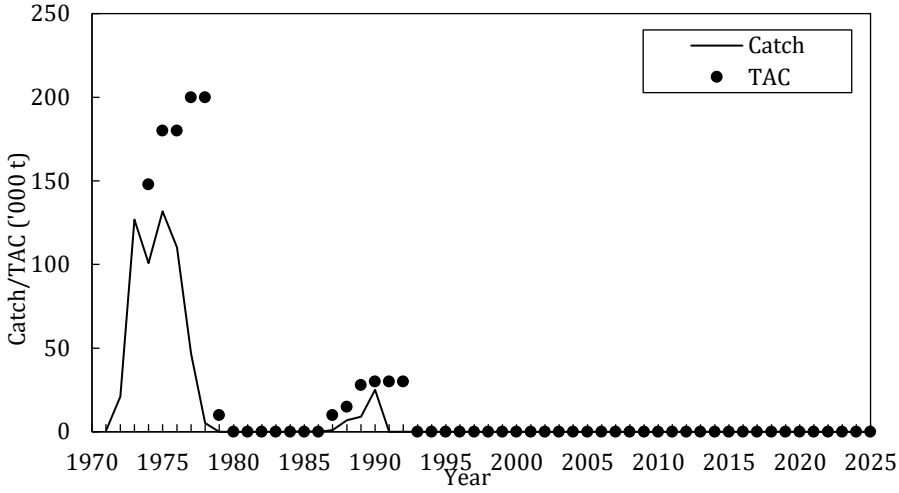


Figure 14.1. Capelin in Divs. 3NO: TACs and estimated catches.

b) Data overview

i) Research survey data

Trawl acoustic surveys of capelin on the Grand Bank previously conducted by Russia and Canada on a regular basis have not been repeated since 1995. In recent years, STACFIS has repeatedly recommended the investigation of the capelin stock in Divs. 3NO utilizing trawl-acoustic surveys to allow the comparison with historical time series. However, this recommendation has not been acted upon. Available indicators of stock dynamics currently include the capelin biomass index from Canadian spring stratified-random bottom trawl surveys. This index varied greatly from 1996-2019 without any clear trend (Fig 14.2, top panel). In 2014, the historical maximum of biomass index (223.8 thousand tons) has been recorded (Fig 14.2, bottom panel). However, in 2016, the biomass index declined to the historical minimum of 3.7 thousand tons. Due to the COVID-19 pandemic, no data from spring surveys for 2020 and 2021 is available. In recent years, the biomass index has shown an increase to 29.6 thousand tons in 2024, followed by an additional increase to 86.0 thousand tons in 2025.

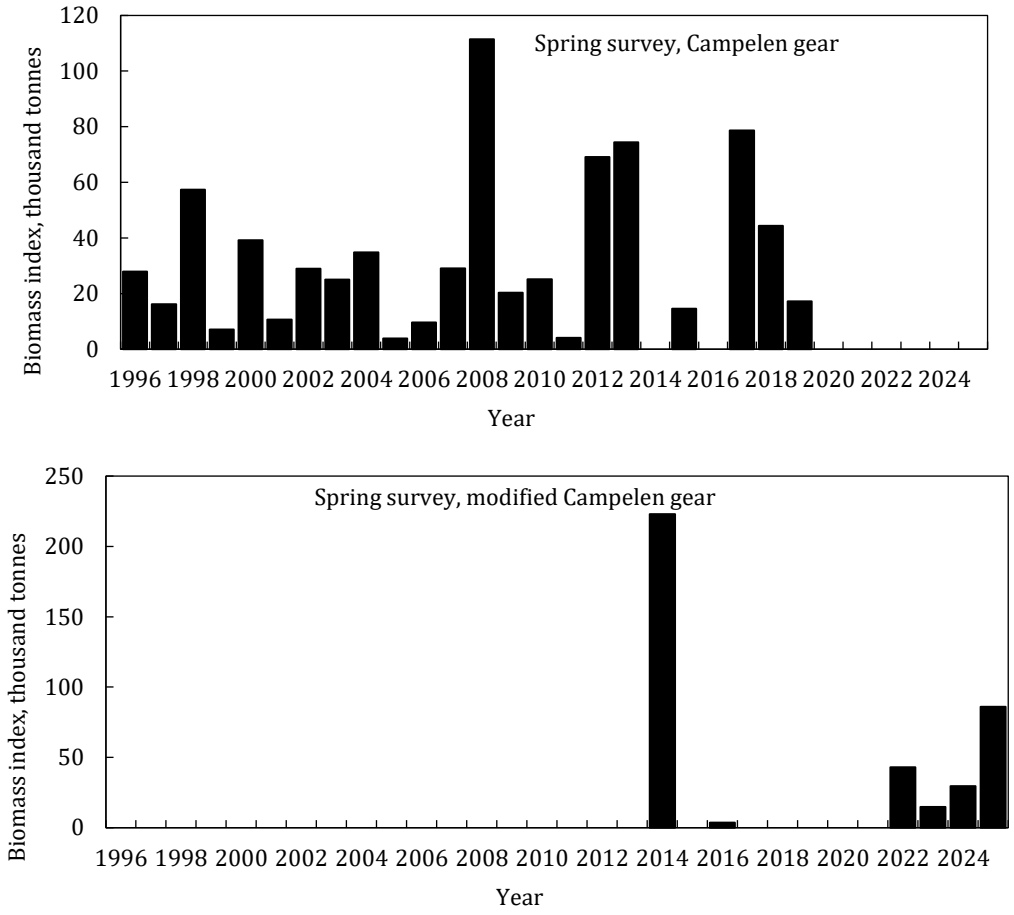


Figure 14.2. Capelin in Divs. 3NO: survey biomass index (bottom trawl) from Canadian spring survey in 1996-2025.

Data from EU-Spain trawl surveys in Divs. 3NO for 1995-2025 are also available (Fig. 14.3). Data from 1995-2000 are from the C/V "Playa de Menduíña", transformed to be comparable with the 2001-2025 R/V "Vizconde de Eza" data. It should be noted that there is a gap in data for 2020, because of the COVID-19 pandemic.

Capelin biomass was at a maximum level for the available timeseries in 2012 (134.2 thousand tons). During 2014-2017 biomass sharply declined from 68.2 thousand tons to 4.5 thousand tons. In 2018-2019, biomass rose to a level similar to that observed in the early 2000s (25.5-15.8 thousand tons). For 2022, a notable increase (up to 69.1 thousand tons) in biomass has been recorded, followed by a decrease to 11.4 thousand tons in 2023. The period of 2024-2025 demonstrates biomass increasing, to 74.7 thousand tons and further to 120.4 thousand tons.

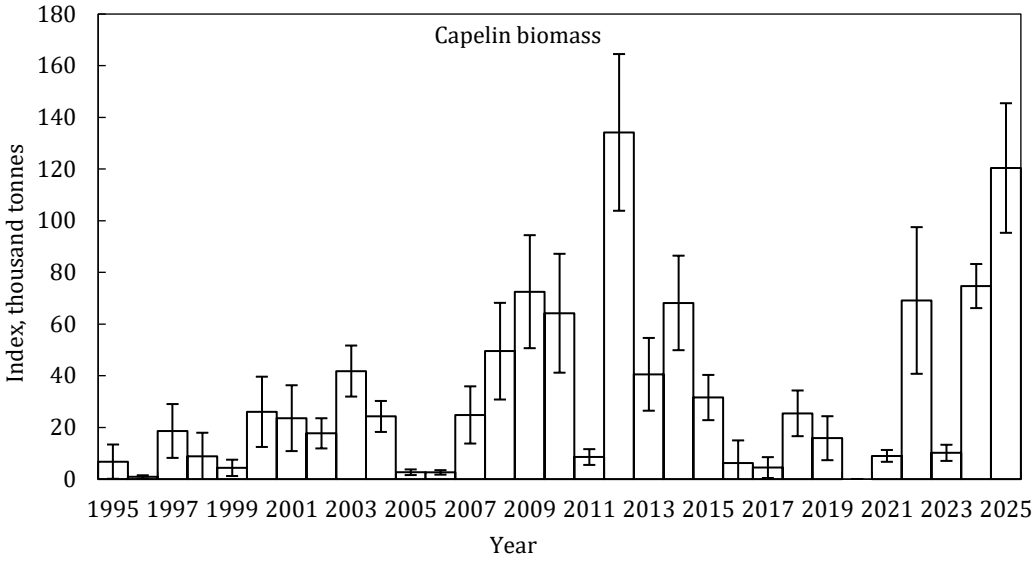


Figure 14.3. Capelin in Divs. 3NO: Biomass index and standard deviations of capelin (1995-2025) based on EU-Spain trawl 3NO surveys.

c) Conclusion

An acoustic survey series that terminated in 1994 indicated a stock at a low level. Biomass indices from bottom trawl surveys since that time have not indicated any substantial change in stock status, although the validity of such surveys for monitoring the dynamics of pelagic species is questionable.

d) Research recommendations

STACFIS reiterates its **recommendation** *that initial investigations to evaluate the status of capelin in Div. 3NO should utilize trawl acoustic surveys to allow comparison with the historical time series.*

Commission has excluded the capelin from its triennial request for full assessment unless surveys indicate a significant change in the state of the stock.

15. Redfish (*Sebastes mentella* and S*ebastes fasciatus*) in Division 3O

Interim Monitoring Report. SCR Docs. 26/001, 002; SCS Docs. 26/05, 06, 07.

a) Introduction

There are two species of redfish that have been commercially fished in Division 3O; the deep-sea redfish *(Sebastes mentella)* and the Acadian redfish *(Sebastes fasciatus*). The external characteristics are very similar, making them difficult to distinguish, and as a consequence, they are reported collectively as "redfish" in the commercial fishery statistics and RV surveys. Within Canada's fishery zone, redfish in Div. 3O have been under TAC regulation since 1974 and with a minimum size limit of 22 cm since 1995. Catch was only regulated by mesh size in the NAFO Regulatory Area (NRA) of Div. 3O prior to the Fisheries Commission adopting a TAC in 2004. Initially, NAFO implemented a TAC at a level of 20 000 t for 2005-2008 and it remained at that level until 2025 when it was reduced to 8 000 t. This TAC applies to the entire area of Division 3O.

Nominal catches have ranged between 3 000 t and 35 000 t since 1960, and have been below 10 000 t since 2007. Catch in 2025 was 4 200 t, about fifty percent higher than in 2024 (Figure 15.1).

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

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
TAC	20	20	20	20	20	20	20	20	8	8
Catches[1]	7.5	6.1	6.5	7.3	5.6	3.9	3.7	2.7	4.2	

[1]CESAG estimates

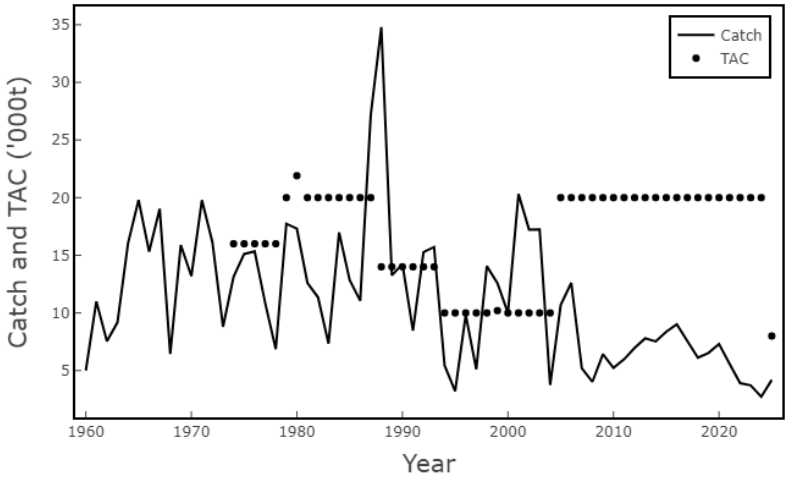


Figure 15.1. Redfish in Div. 3O: TACs and estimated catches. TACs prior to 2004 were applied only to Canadian waters.

b) Data overview

i) Research survey data

Canadian stratified-random surveys that cover the entire stock area began in 1991. Surveys were incomplete in spring 2006 and 2021, and autumn 2014, 2021, and 2022. Beginning in 2022, new survey vessels have been used to conduct the Canadian multi-species surveys. For redfish in Div. 3O, conversion factors that would allow data from the new vessels to extend existing time series data from the former primary research vessels (CCGS Wilfred Templeman and CCGS Alfred Needler) were only available for the spring Teleost series.

A standardized spring biomass series was developed by rescaling the Campelen data to be comparable to modified Campelen data using the ratio of the means of survey values (modified Campelen / Campelen) during a period of overlap (2013-2019).

The spring and autumn surveys were completed in Div. 3O in 2023, 2024 and 2025. However, Canadian autumn data for 2023 onwards are not comparable to the earlier years due to absence of conversion factors and inability to rescale autumn Campelen data.

Data were available from EU-Spain spring surveys conducted in the NRA of Div. 3O from 1997 to 2025, with the exception of 2020.

Results of bottom trawl surveys for redfish in Div. 3O have shown considerable variability, making it difficult to interpret interannual changes. However, trends across the survey series are consistent and show indices generally at or above the time-series mean during two periods: the mid to late 1990s, and during 2009 to 2015. All available surveys since 2018 have been below their long-term mean (Figure 15.2).

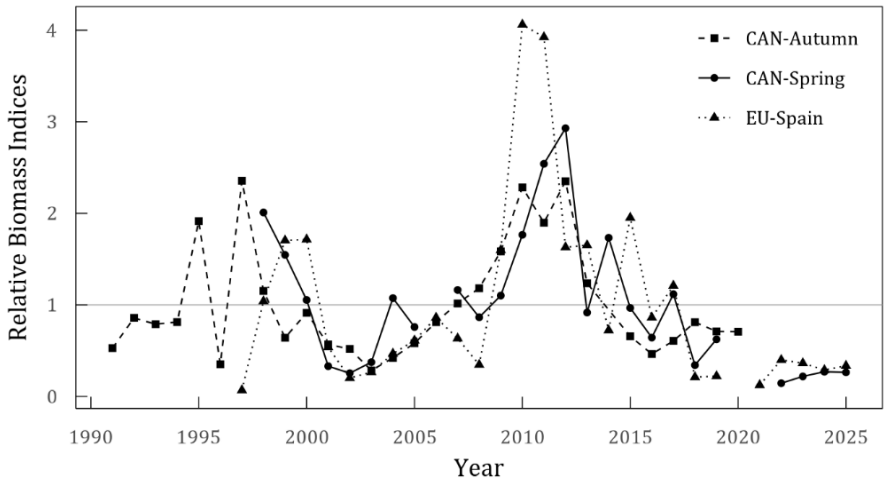


Figure 15.2. Redfish in Div. 3O: Survey biomass indices from Canada and EU-Spain. Indices were normalized by dividing by their time-series means. The Canadian autumn survey in 2023-2025 is not presented as data could not be made relative.

c) Conclusion

Available survey indices indicate there has been no change in the perception of the status of this stock.

d) Research recommendations

STACFIS reiterates the **recommendation** that *for redfish in Division 3O, work continue on developing an assessment model for the stock.*

STACFIS reiterates the **recommendation** that *stock boundaries and definitions as well as synchronicity with adjacent stocks be explored.*

STACFIS reiterates the **recommendation** that *the reference point for this stock be reviewed at the 2028 assessment, or earlier if there are considerable advances in an analytical approach for this stock, or a significant change in available data or the understanding of stock dynamics*.

STACFIS reiterates the **recommendation** that *work continue on developing a standardized recruitment index.*

The next full assessment of the stock is scheduled for 2028.

16. Thorny skate (*Amblyraja radiata*) in Divisions 3LNO and Subdivision 3Ps

The lack of a Designated Expert for this stock prevented the Scientific Council from being able to carry out a full assessment or an Interim Monitoring Report. This situation will persist until a DE is appointed.

The relevant data for this stock can be found in previous Scientific Council reports, in the National Research reports for the year 2025, and in the survey SCRs.

17. White hake (*Urophycis tenuis*) in Divisions 3NO and Subdivision 3Ps

The lack of a Designated Expert for this stock prevented the Scientific Council from being able to carry out a full assessment or an Interim Monitoring Report. This situation will persist until a DE is appointed.

The relevant data for this stock can be found in previous Scientific Council reports, in the National Research reports for the year 2025, and in the survey SCRs.

WIDELY DISTRIBUTED STOCKS: SUBAREA 2, SUBAREA 3 AND SUBAREA 4

Environmental Overview

The STACFEN Committee did not meet during the 2026 SC June meeting. Therefore, no environmental overviews, including the update of environmental conditions for 2025, were available to SC. The lack of this information increases the uncertainty of all stock assessments, as any potentially relevant environmental connections would have gone undetected.

18. Roughhead Grenadier (*Macrourus berglax*) in Subareas 2 and 3

Interim Monitoring Report. SCR Docs. 98/57, 19/23, 24/37, 26/01, 02, 03, 05; SCS Docs. 26/05, 06, 10.

a) Introduction

This stock was last fully assessed in 2019. The stock structure of this species in the North Atlantic remains unclear because there is little information on the number of different populations that may exist and the relationships between them. Roughhead grenadier is distributed throughout NAFO Subareas 0 to 3 in depths between 300 and 2 000 m. However, for assessment purposes, Scientific Council considers the population of Subareas 2 and 3 as a single stock.

A substantial part of the grenadier catches in Subarea 3 previously reported as roundnose grenadier was actually roughhead grenadier. To correct the catch statistics, STACFIS revised and approved the roughhead grenadier catches from 1987-1997. In the period 2007-2012, catches for Subarea 2+3 roughhead grenadier were stable and averaged 900 t. In the period 2013-2025, catches decreased to their lowest levels since 1987 and averaged around 400 t (Fig. 18.1). Most of the catches were taken in Divs. 3KLMN by the fleets of Spain, Canada, Portugal, Japan and Russia as bycatch in the Greenland halibut fishery. This stock is assessed by the Scientific Council but it is not managed by the NAFO Commission. There is no TAC for this stock.

Recent catches ('000 t) are as follows:

	2017	2018	2019	2020	2021	2022	2023	2024	2025
Catches[1]	0.4	0.5	0.4	0.4	0.4	0.5	0.4	0.4	0.5

[1] CESAG estimates

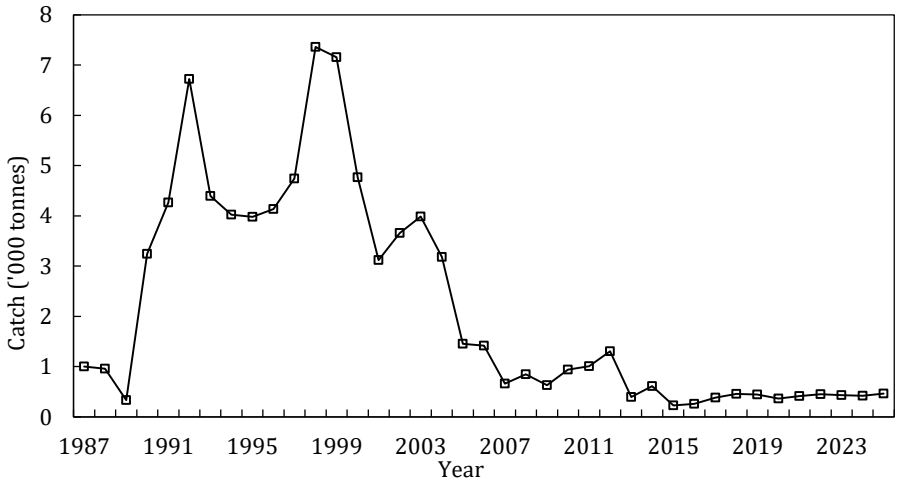


Figure 18.1. Roughhead grenadier in Subareas 2+3: estimated catches.

b) Data overview

i) Surveys

There are no survey indices available covering the total distribution, in depth and area, of this stock. According to other information, this species predominately inhabits depths ranging from 800 to 1 500 m, therefore the best survey indicators of stock biomass are the series extending to 1 500 m depth as they cover the depth distribution of roughhead grenadier fairly well. Figure 18.2 presents the biomass indices for the following series extending to 1 500 m depth: Canadian fall 2J+3K Engel (1978-1994) and Canadian fall 2J+3K Campelen (1995-2025), EU-Esp 3NO (1997-2025), EU-Esp 3L (2006-2025) and EU Flemish Cap (to 1 400 m; 2004-2025). From 2023, the Canadian fall survey is carried out with a new vessel but the catchability between the old and new vessels was found to be comparable for roughhead grenadier. Survey coverage deficiencies – particularly for strata >750m – within Divs. 2J+3K were such that the 2008, 2018, 2019, 2021, 2024 and 2025 indices from

the Canadian fall Divs. 2J+3K surveys were not considered comparable to those of the other years. The survey was not carried out in 2022. In 2020, the EU-Esp 3NO survey was not carried out due to the pandemic situation and during 2020-2022, the EU-Esp 3L survey was not carried out due to the pandemic situation and other survey problems.

Survey biomass indices showed a general increasing trend in the period 1995-2004. During 2005-2019, the Canadian 2J+3K survey indices continued to increase whereas the other three time series showed a general decrease. During 2020-2024, there were multiple data gaps in the time series particularly in the Canadian 2J+3K and EU-Esp 3L indices. The biomass indices available remained near their time series low in 2021-2022, but increase in 2023 and especially in 2024 and 2025 to near record highs.

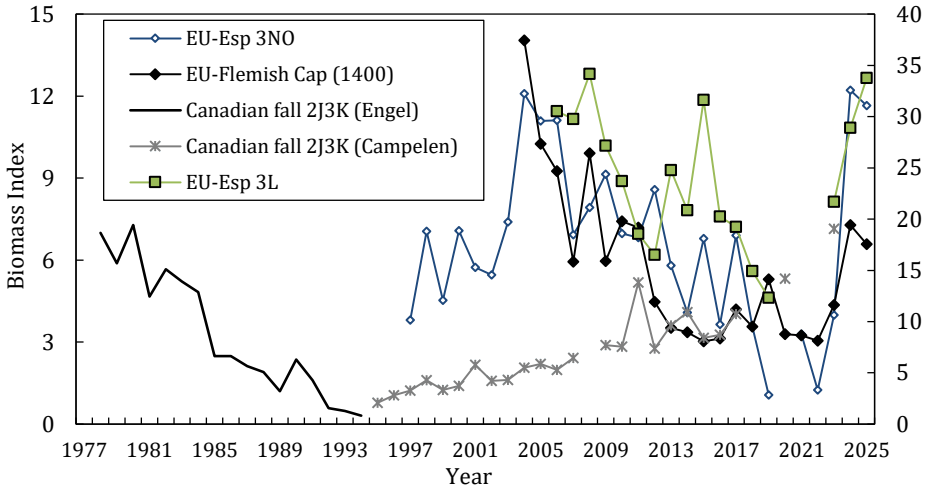


Figure 18.2. Roughhead grenadier in Subareas 2+3: Survey biomass indices (MWPT). On the main y-axis, all series except the EU-Esp 3L series, which is on the secondary y-axis.

The catch-biomass (C/B) ratios showed a clear declining trend from 1995-2005 and since then have been stable at low levels with the exception of the of the EU-Esp 3NO survey index in the year 2019 and 2022 (Figure 18.3). The C/B ratio of the Flemish Cap series shows a slightly increasing trend during 2019-2022. In the 2023-2025 period, the available indices were generally low and similar to the values observed in 2013-2017 period.

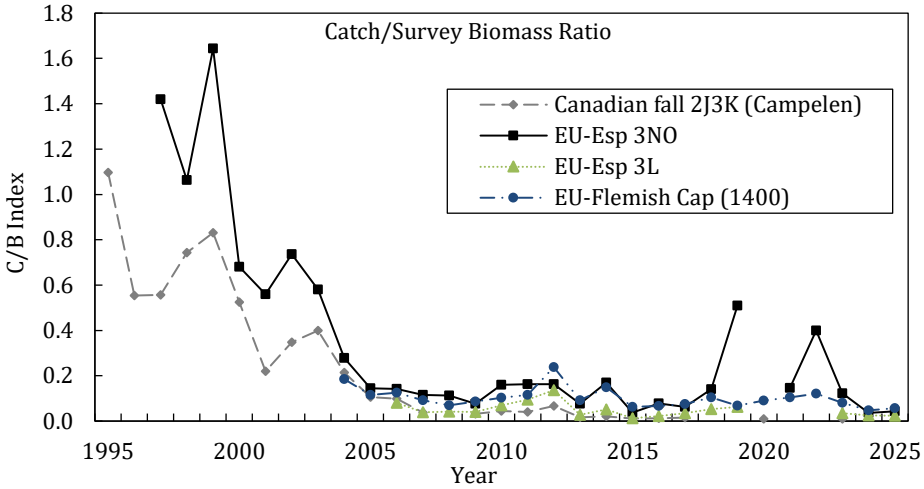


Figure 18.3. Roughhead grenadier in Subareas 2+3: catch/biomass indices based upon Canadian fall (Campelen series), EU-Esp 3NO, EU-Esp 3L and EU-Flemish Cap (to 1400 m depth) surveys.

c) Conclusion

The lack of survey indices in the period 2020-2025 limits our understanding of stock status since 2019, but the available biomass indices indicate that there was a general decrease over the 2007-2022 period with the exception of the Canadian 2J3K survey, which contradicted this trend. The available indices showed substantial recovery in the 2023-2025 period compared to that observed in 2022. Fishing mortality indices (catch/survey biomass ratio) have remained at low levels since 2005 with the exception of the EU-Esp 3NO survey indices in 2019 and 2022. The 2023-2025 fishing mortality indices were close to the minimum of the series. Based on available information it appears that the stock biomass has increased substantially in recent years (2023-2025) from the low levels observed in the 2020-2022 period. Fishing mortality indices continue to be at low levels.

This stock will be monitored by Interim Monitoring Reports until such time that conditions change to warrant a full assessment.

19. Greenland halibut (*Reinhardtius hippoglossoides*) in Subarea 2 + Divisions 3KLMNO

Interim Monitoring Report. SCS Docs. 26/07, 06, XX; SCS Docs. 26/05, 24/001REV2, 002REV2, 037, 25/025, 26/003, 001, 005, 002; FC Docs. 03/13, 10/12, 13/23, 16/20; COM Docs 17/17, 24/16.

a) Fisheries and Catches

Prior to 1995, TACs were set autonomously by Canada; thereafter, TACs have been established by the NAFO Fisheries Commission. Following development of the fishery in the early 1960s, catches generally ranged between 20 000 t and 40 000 t. Catches increased sharply to 65 000 t in 1990, largely due to the expansion of the fishery in the NAFO Regulatory Area in Divs. 3LMNO, and remained at high levels during 1991–1994. The catch was only 15 000 to 20 000 t per year in 1995–1998. Catches increased after 1998, reaching 38 000 t in 2001, before declining to approximately 35 000 t in 2003. In 2003, a fifteen-year rebuilding plan was implemented by Fisheries Commission for this stock (FC Doc. 03/13). Though much lower than values in the early 2000s, estimated catch over 2004-2010 exceeded the TAC by considerable margins. TAC over-runs ranged from 22%–64%, despite considerable reductions in fishing effort. The STACFIS estimate of catch for 2010 was 26 170 t (64% over-run). In 2010, Fisheries Commission implemented a survey-based Management Procedure (MP), which incorporated a harvest control rule (HCR) (FC Doc. 10/12) to generate annual TACs over at least 2011-2014, through which period the catch exceeded the TAC in every year. In 2013 Fisheries Commission extended the 2010 management approach to set the TACs for 2015–2017 (FC Doc. 13/23), but did not apply the HCR in 2017, rather setting the TAC equal to the 2016 TAC (FC Doc. 16/20). TACs between 2018–2024 were based on the HCR adopted in 2017 (COM Doc. 17/17), and TACs since 2025 have been based on the HCR adopted in 2024 (COM Doc. 24/16). Catches have closely tracked TACs since 2015. The TAC in 2025 was 14 791 t and 14 513 t were caught. The TAC for 2026 is 14 729 t.

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

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
TAC	14.80	16.50	16.52	16.93	16.50	15.86	15.16	15.15	14.79	14.73
Catch[1]	14.76	16.63	16.48	16.31	15.04	15.67	14.16	14.82	14.51	--

[1] CESAG estimates

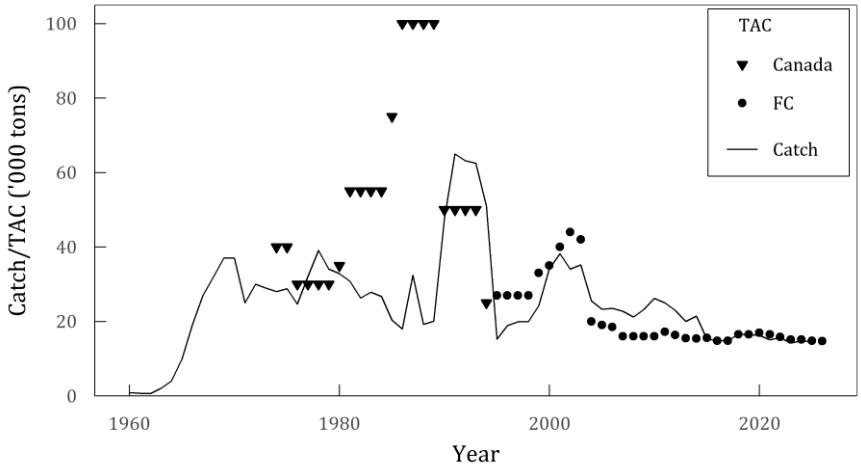


Figure 19.1. Greenland halibut in Subarea 2 + Divs. 3KLMNO: TACs and estimated catches.

b) Data overview

Abundance and biomass indices were obtained from research vessel surveys conducted by Canada, the EU, and EU-Spain. While indices are available for most years, some were excluded or unavailable due to coverage issues, interruptions from the COVID-19 pandemic, or the prioritization of comparative fishing experiments. Available indices were analyzed to represent population trends from the various surveys.

For the Canadian autumn survey in Divs. 2J3K, data were available from 1996–2025; from the Canadian spring survey in Divs. 3LNO from 1996–2025; and for the Canadian autumn survey in Divs. 3LNO to 730 m from 1996–2025. Since 2023, Canadian surveys have been conducted using new research vessels and a modified trawl. Indices from the Canadian spring survey in 3LNO are not extended beyond 2019 due to the absence of a conversion factor. Conversion factors have been applied to the Canadian autumn surveys in 2J3K and 3LNO, and the effect of a bias in these factors has been tested under the latest management strategy evaluation simulations.

For the EU survey in Div. 3M to 730 m, data are available from 1988–2025, and to 1460 m from 2004–2025; for the EU-Spain survey in Divs. 3NO from 1997–2025 and in 3L from 2003–2025.

i) Research survey data

A single survey series which covers the entire stock area is not available. A subset of standardized (depth and area) stratified random survey indices have been used to monitor trends in resource status, and are described below.

Canadian stratified-random autumn surveys in Divs. 2J and 3K: Abundance and biomass indices from the Canadian autumn survey of Divs. 2J3K have shown a series of increases and decreases since 1996 (Fig. 19.2). The abundance index decreased between 1996–2005, increased between 2005–2011 and, following a decrease in 2012, the index has remained relatively low and stable. The biomass index has fluctuated since 1996, with local maxima around 1999, 2007, 2014 and 2024, and local minima around 2002, 2010 and 2017–2020; the index has been relatively low since 2017, with a potential increase in 2024.

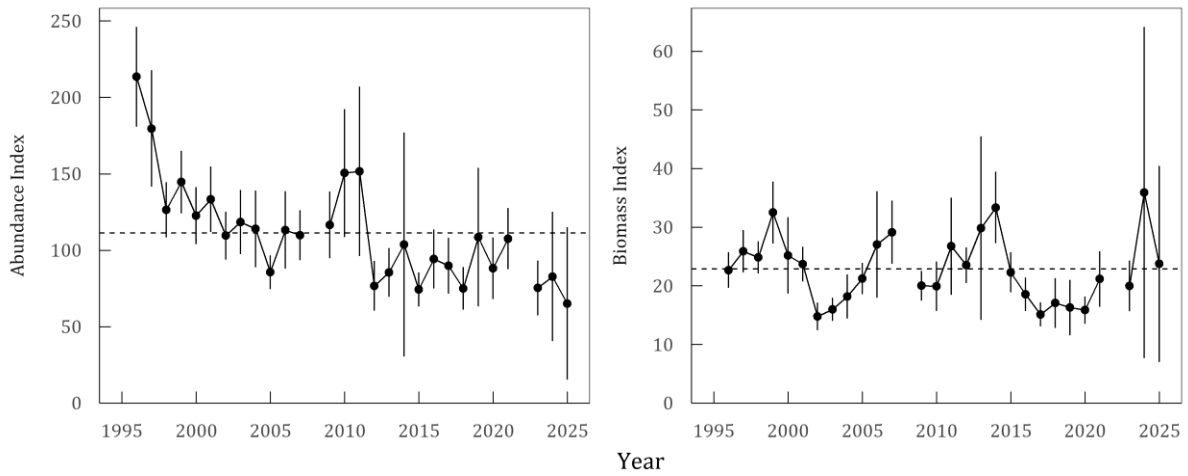


Figure 19.2. Greenland halibut in Subarea 2 + Divs. 3KLMNO: abundance (left) and biomass (right) indices (with 95% CI) from Canadian autumn surveys in Divs. 2J and 3K. The dashed line represents the time-series average.

Canadian stratified-random spring surveys in Divs. 3LNO: Abundance and biomass indices from the Canadian spring surveys in Divs. 3LNO (Fig. 19.3) declined from relatively high values in the late 1990s and has been relatively low in most years thereafter. Abundance and biomass indices from 2018 and 2019 have increased from 2016 levels. Trends since 2019 are unknown due to recent survey interruptions and the lack of a conversion factor for this series.

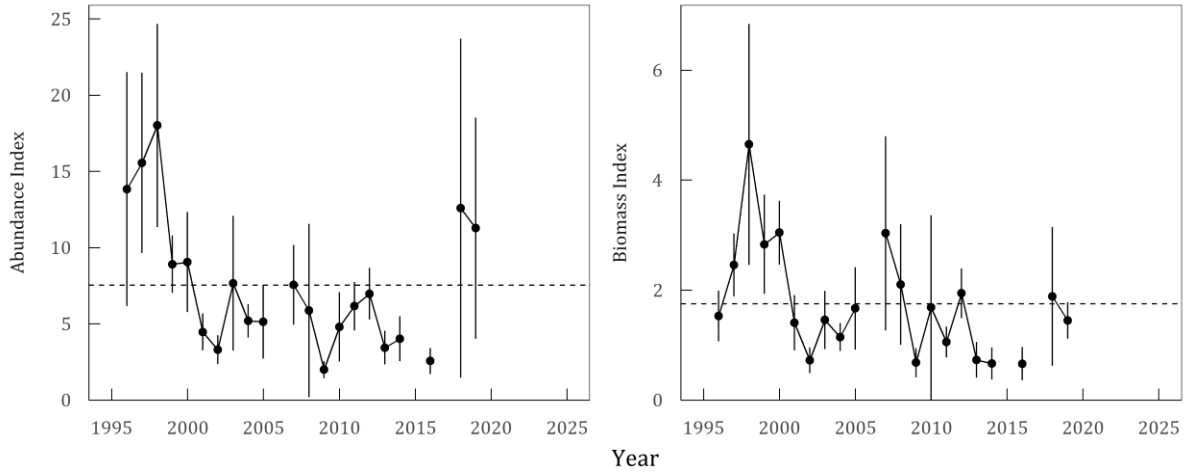


Figure 19.3. Greenland halibut in Subarea 2 + Divs. 3KLMNO: abundance (left) and biomass (right) indices (with 95% CI) from Canadian spring surveys in Divs. 3LNO. The dashed line represents the time-series average.

Canadian stratified-random autumn surveys in Divs. 3LNO: Time series of abundance and biomass were developed from the Canadian autumn surveys from 1996–2025 to a depth of 730 m. The abundance index from the Canadian autumn surveys in Divs. 3LNO (Fig. 19.4) declined from relatively high values in the mid to late 1990s then varied without trend until 2013. This index increased from a low in 2015 to 2020. Like the abundance index, the biomass index increased between 2015–2020. Both the abundance and biomass indices appear to have decreased since 2020, falling to below-average levels.

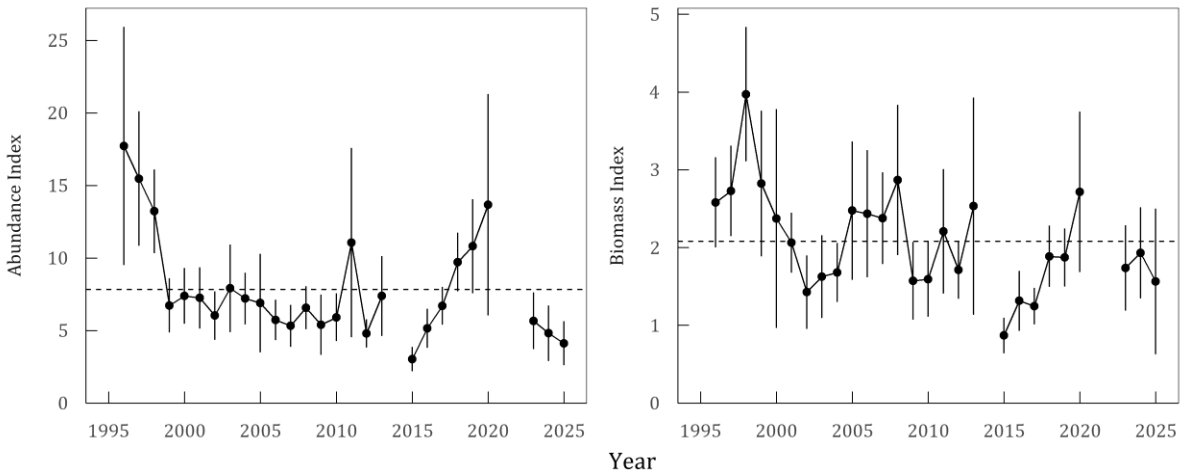


Figure 19.4. Greenland halibut in Subarea 2 + Divs. 3KLMNO: abundance (left) and biomass (right) indices (with 95% CI) from Canadian autumn surveys in Divs. 3LNO. The dashed line represents the time-series average.

EU stratified-random surveys in Div. 3M (Flemish Cap): Surveys conducted by the EU in Div. 3M during summer indicate that the Greenland halibut biomass index in depths to 730 m increased to a maximum value in 1998, after which the index declined to a time-series minimum in 2013 (Fig. 19.5). This index has remained below the series average since 2009. The Flemish Cap survey was extended to cover depths down to 1460 m beginning in 2004, and this index has been relatively stable but more variable than the shallower series. The deep index was above the time-series average in 2023, but was below average in 2024 and 2025.

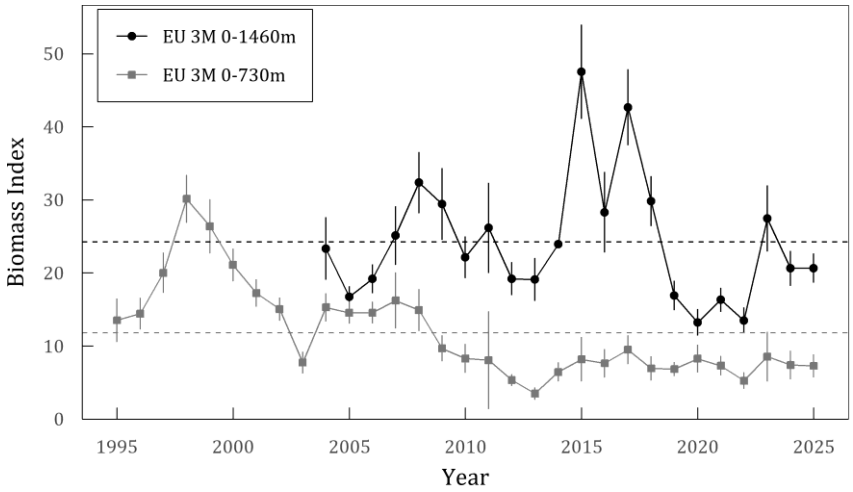


Figure 19.5. Greenland halibut in Subarea 2 + Divs. 3KLMNO: Biomass index (with 95% CI) from EU Flemish Cap surveys in Div. 3M. Grey squares: biomass index for depths <730 m. Black circles: biomass index for all depths <1460 m. Dashed lines represent time-series averages.

EU-Spain stratified-random surveys in NAFO Regulatory Area (NRA) of Divs. 3LNO: The biomass index for the survey of the NRA in Divs. 3NO has fluctuated without trend over the time series (Fig. 19.6). The biomass index for the survey of the NRA in Div. 3L has generally increased from 2003 to 2017 and has declined since then.

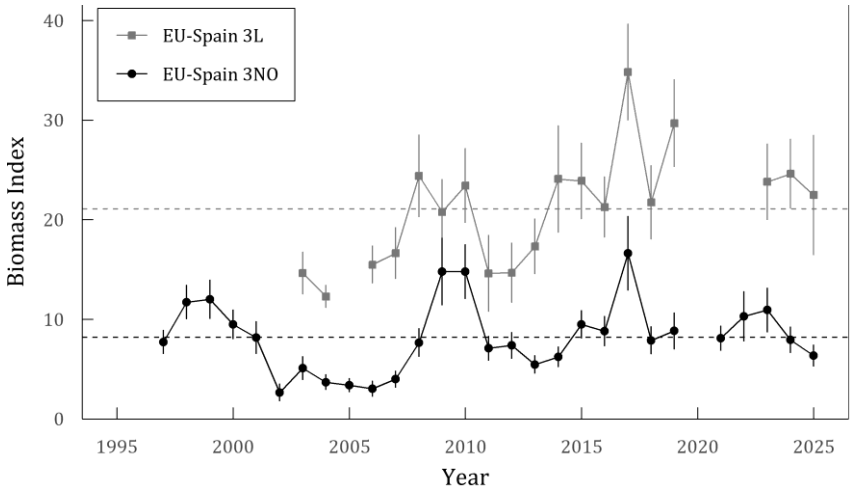


Figure 19.6. Greenland halibut in Subarea 2 + Divs. 3KLMNO: biomass index (with 95% CI) from EU-Spain spring surveys in the NRA of Divs. 3NO and Div. 3L. Dashed lines represent time-series averages.

Summary of research survey data trends.

These surveys provide coverage of the majority of the spatial distribution of the stock and the area from which the majority of catches are taken. Over 1995–2007, indices from the majority of the surveys generally provided a consistent signal in stock biomass (Fig. 19.7). Results since 2007 show greater divergence which complicates interpretation of overall status; the overall trend since 2007 is unclear.

Though divergent trends in the survey indices complicate interpretations of the state of the stock, the survey indices are not deviating significantly from expectations under the Management Procedure. Most survey indices are within the 95% probability envelopes from the base case SCAA (Figure 19.8) and SSM simulations (Figure 19.9). The composite index suggests that the stock is stable and the most recent value is within the 80% probability envelope from both models.

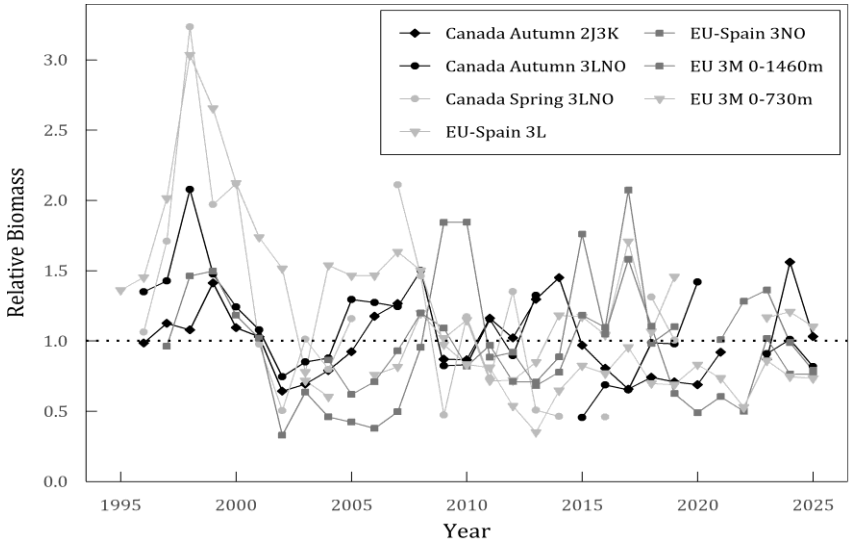


Figure 19.7. Greenland halibut in Subarea 2 + Divs. 3KLMNO: Relative biomass indices from Canadian autumn surveys in Divs. 2J3K, Canadian spring surveys in Divs. 3LNO, Canadian autumn surveys in Divs. 3LNO, EU surveys of Div. 3M, EU-Spain surveys in Div. 3L, and EU-Spain surveys of Divs. 3NO. Each series is scaled to its average and the average line is shown with a dotted line.

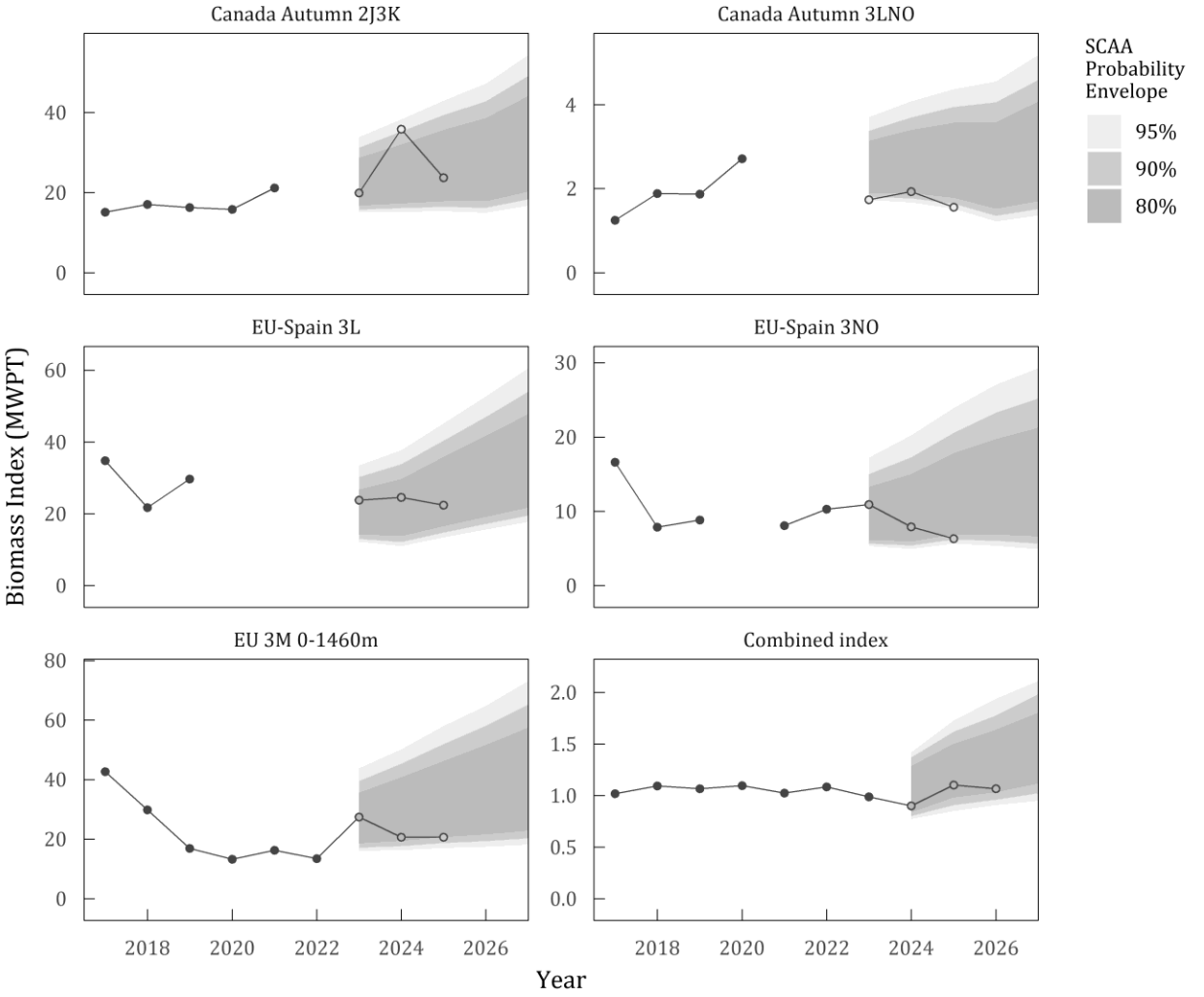


Figure 19.8. Greenland halibut in Subarea 2 + Divs. 3KLMNO: Mean weight per tow from Canadian Autumn surveys in Divs. 2J3K, Canadian Autumn surveys in Divs. 3LNO, EU-Spain surveys in Div. 3L, EU-Spain surveys in Divs. 3NO, and EU Flemish Cap surveys (to 1460m depth) in Div. 3M. The figure also shows the combined index used in the target based component of the MP. For the survey and combined indices, 80%, 90% and 95% probability envelopes from the **SCAA** base case simulation are shown. Index values observed from 2023 onward are shown using open circles.

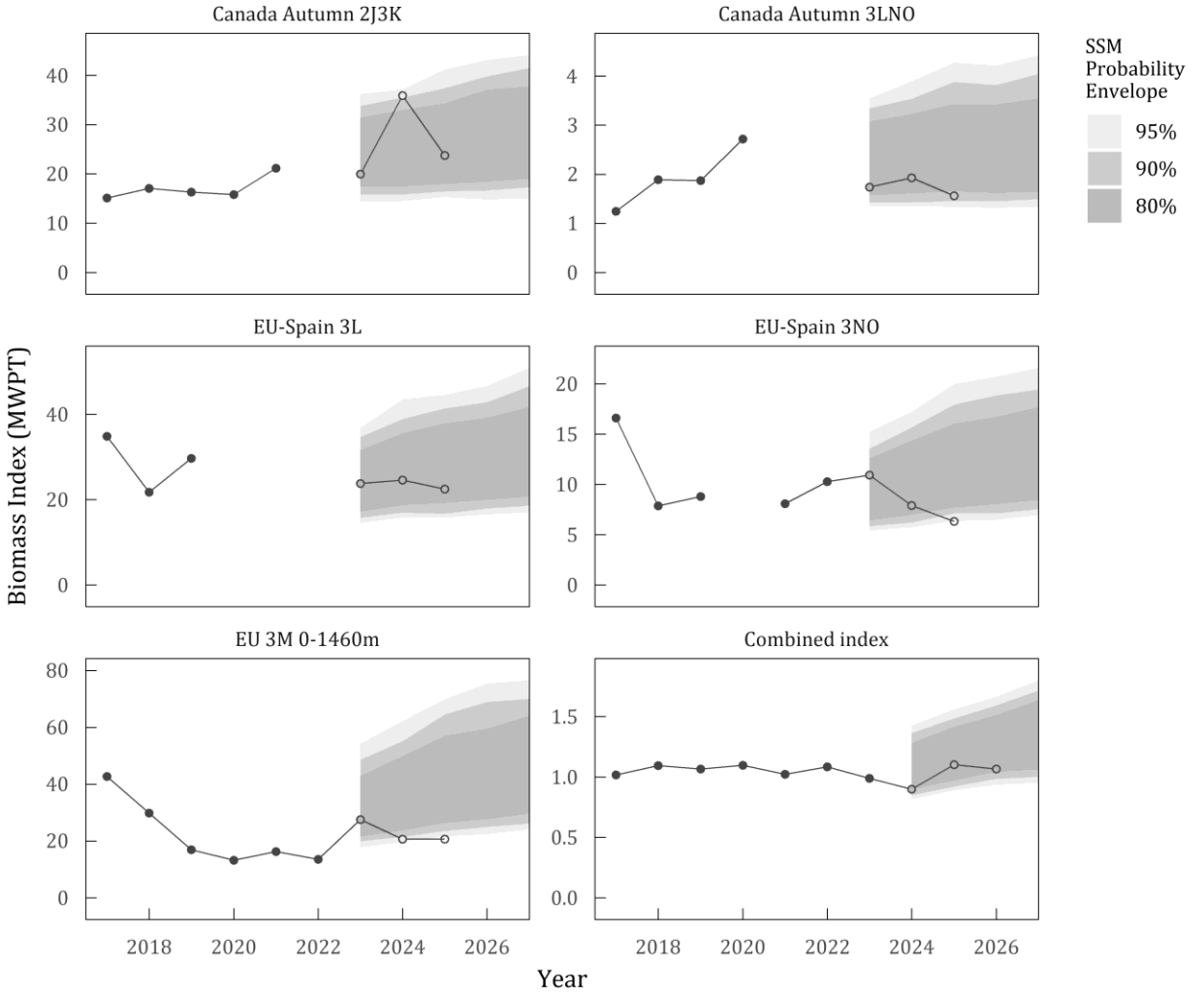


Figure 19.9. Greenland halibut in Subarea 2 + Divs. 3KLMNO: Mean weight per tow from Canadian Autumn surveys in Divs. 2J3K, Canadian Autumn surveys in Divs. 3LNO, EU-Spain surveys in Div. 3L, EU-Spain surveys in Divs. 3NO, and EU Flemish Cap surveys (to 1460m depth) in Div. 3M. The figure also shows the combined index used in the target based component of the MP. For the survey and combined indices, 80%, 90% and 95% probability envelopes from the **SSM** base case simulation are shown. Index values observed from 2023 onward are shown using open circles.

Recruitment from surveys

Abundance indices at age 4 from surveys were examined as a measure of recruitment (Figure 19.10). For all surveys, the 1993–1994 year classes were above average and the 2008–2012 year classes below average. Following very large 2000–2002 year classes estimated in the EU survey of Div. 3M, year classes were below average for 12 years. Estimates for the 2015–2019 year classes indicate they are near or above the time-series average; however, available indices for the 2021 year class indicate it is below average.

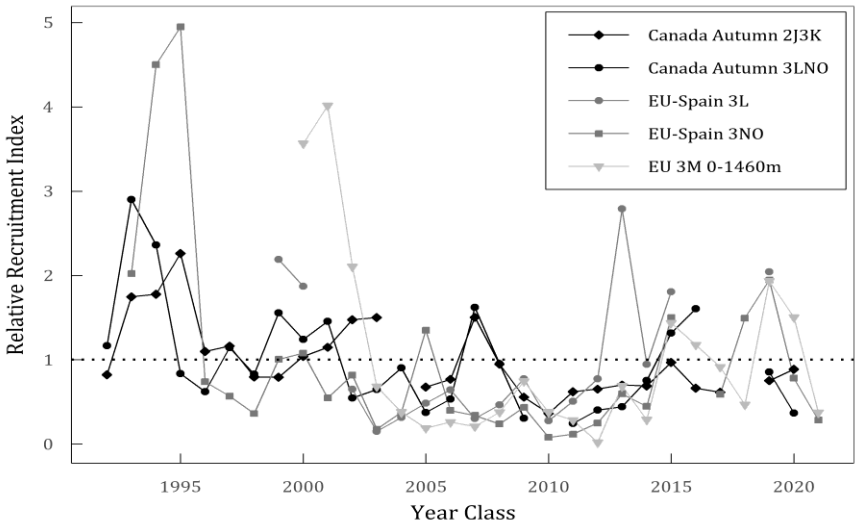


Figure 19.10. Greenland halibut in Subarea 2 + Divs. 3KLMNO: Relative recruitment indices at age 4 from Canadian autumn surveys in Divs. 2J3K, Canadian spring surveys in Divs. 3LNO, and EU survey of Div. 3M. Each series is scaled to its average, which is shown using a dotted line.

c) Conclusion

The most recent survey indices remain consistent with expectations under the current Management Procedure.

d) Research recommendation

The divergence in survey indices could be the result of movement of fish or because of transient age effects as a result of changing recruitment when different surveys cover differing age-ranges. STACFIS **recommends** that *tagging and/or telemetry studies be undertaken to help elucidate movement of 2+3KLMNO Greenland halibut*.

STATUS: An update on telemetry research was presented in 2025, providing new information on the spatial and depth distribution of Greenland halibut. Results were consistent with previous research and assessments, including the occupancy of deeper waters by larger fish, and are expected to improve interpretation of survey data and their application in future assessments.

20. Northern shortfin squid (*Illex illecebrosus*) in Subareas 3+4

Deferred to September 2026.

21. Splendid alfonsino (*Beryx splendens*) in Subarea 6

Interim Monitoring Report. SCR Docs. 15/06, 20/36; SCS Doc. 19/20.

a) Introduction

Alfonsino is distributed over a wide area which may be composed of several populations. Alfonsino is an oceanic demersal species that forms distinct aggregations, at 300–950 m depth, on top of seamounts in the North Atlantic. The stock structure in the NAFO Area is unknown. Until more complete data on stock structure is obtained it is considered that separate populations live on each seamount of Div 6G.

Most published growth studies suggest a maximum life span between 10 and 20 years. The observed variability in the maximum age and length depends on the geographic region. Sexual maturation was found to begin at age 2, with a mean length of 18 cm. By age 5–6 years, all individuals are mature at 25–30 cm fork length. On the Corner Rise Seamounts, alfonsino have been observed to spawn from May-June to August-September.

As a consequence of the species' association with seamounts, their life-history, and their aggregation behaviour, this species is easily overexploited and can only sustain low rates of exploitation

b) Description of the fishery

Historically, catches of alfonsino in the NAFO Regulatory Area (NRA) have been reported from Divs. 6E-H, although the bulk of those catches were made in the Corner Rise area Div. 6G. The development of the Corner Rise fishery was initiated in 1976. Commercial aggregations of alfonsino on the Corner Rise have been found on three seamounts. Two of them named "Kükenthal" (also known as "Perspektivnaya") and "C-3" ("Vybornaya") are located in NRA. One more bank, named "Milne Edwards" ("Rezervnaya") is located in the Central Western Atlantic.

Russian vessels fished these areas during some periods between 1976 and 1999 using pelagic trawls. A directed commercial fishery has been conducted between 2005 and 2019 by Spanish vessels. Since 2006, virtually all the effort has been made in the Kükenthal seamount with pelagic trawl gear.

Fishery was closed in 2020 based on scientific advice that the stock was depleted.

c) Commercial fishery data

The Russian fishery started in 1976 with a catch of 10 200 t (Fig. 21.1). Thereafter, the catches ranged between 10 and 3 500 t. There was no fishing effort from 1988-1993, 1998 and 2000-2003. From 2005 to 2019, an alfonsino-directed fishery in Kükenthal seamount was conducted by Spanish vessels using pelagic trawl gear, where catches ranging between 1 to 1 187 t, with no fishery in 2008. In the 2020-2025 period, the fishery has been closed and alfonsino catches were zero.

Table 21.1. Alfonsino in Subarea 6: Recent catches (t), effort and CPUE (Kg/hr fished) for the alfonsino fishery on Kukenthal Peak.

	2017	2018	2019	2020	2021	2022	2023	2024	2025
Catch (t)	51	2	1	0	0	0	0	0	0
Effort (days on ground)	12	8	8	0	0	0	0	0	0
Effort (hours fished)	68	33	33	0	0	0	0	0	0
CPUE (Kg/hour)	750	61	42						
Effort (vessels)	1	1	1	0	0	0	0	0	0

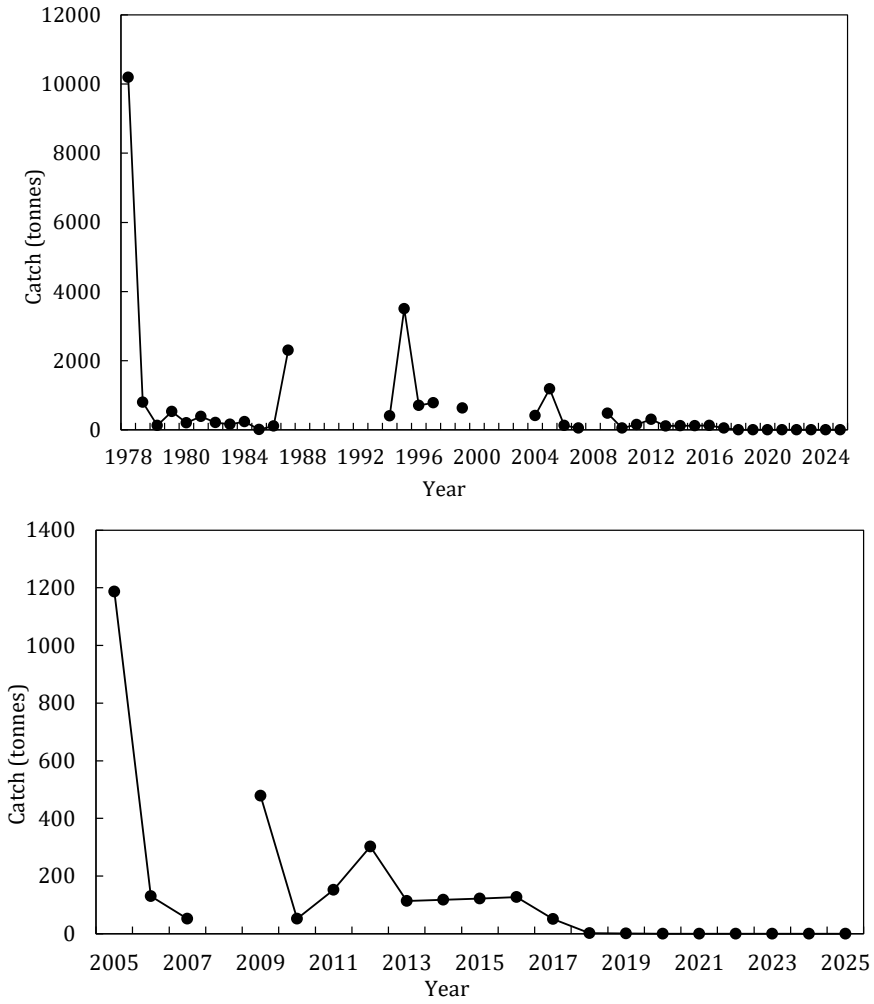


Figure 21.1. Alfonsino in Subarea 6: Alfonsino catches from Div. 6G. Top panel illustrates the whole catch series (1978-2025) and bottom panel illustrates the catch series since 2005.

The available commercial length distributions and their density plots by year (2004, 2007, 2009, 2012 and 2016-2019) are presented in Figure 21.2. It can be observed that in the period 2007-2018, these length distributions show a slight decrease in the mode over time. Catches in this period are in the 30-50 cm range with a mode around or bigger than 40 cm. The 2019 length distribution shows a smaller range with a mode around 38 cm.

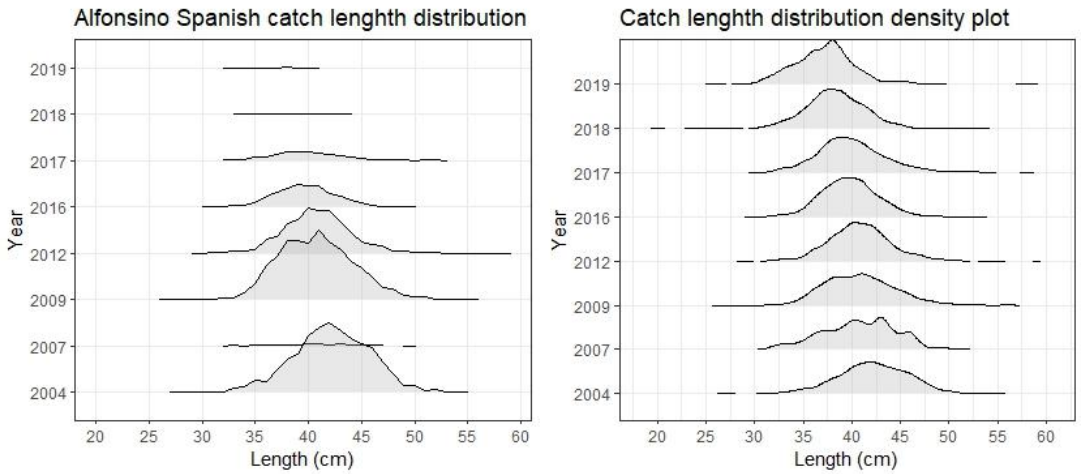


Figure 21.2. Alfonsino in Subarea 6: Length distributions and density length distributions of alfonsino catches from Div. 6G.

d) Surveys

The only information available is data from Russian research, exploratory and fishing cruises presented by Vinnichenko (2015). These data cover the period ending in 1995. The alfonsino biomass estimated on Corner Rise with these data was around 11 000-12 000 t. It should be considered that the data with a time limitation of mainly 20-30 years were used for the calculations mentioned above. Based on this information, the greatest biomass of mature alfonsino (distribution depths of 400-950 m) was registered on the "Kükenthal" seamount. On the "C-3" and "Milne Edwards" seamounts, the biomass was much lower.

An acoustic survey plan to collect alfonsino data and estimate its biomass has been presented in 2020 to the SC for discussion. The SC concluded that the presented acoustic survey plan may be appropriate to collect fishery-independent information that could help the future evaluation of this stock.

e) Conclusion

No analytical- or survey-based assessment was possible. The most recent assessment, in 2019, concluded that the stock appeared to be depleted. There is no new information available to update the evaluation carried out in 2019 and reported in the IMR of 2020. The fishery was closed during the 2020-2025 period.

f) Special comments

Periods of decline in catches have been observed several times in the past after several years of fishing, followed by an increase in catches after a period of low/no removals; however, it is unknown if this corresponded to stock recovery. In the absence of new data (e.g. from an exploratory fishery or survey) there will be no basis to update the assessment made in 2020.

g) Research recommendations

SC **recommended** in 2019 that *fishery-independent information should be collected on this stock. This is especially important given that the fishery has been closed since 2020, and there will not be CPUE or any other fishery-dependent or independent information to monitor whether there is any recovery.*

IV. OTHER MATTERS

1. FIRMS Classification for NAFO Stocks

Scientific Council reiterates that the Stock Classification system is not intended as a means to convey the scientific advice to the Commission and should not be used as such. Its purpose is to respond to a request by FIRMS to provide such a classification for their purposes. The category choices do not fully describe the status of some stocks. Scientific advice to the Commission is to be found in the Scientific Council report in the summary sheet for each stock.

Stock Size (incl. structure)	Fishing Mortality			
	None–Low	Moderate	High	Unknown
Virgin–Large		3LNO Yellowtail Flounder		
Intermediate	3LN Redfish	3M Redfish[1] SA2+3KLMNO Greenland halibut 3M cod SA 0+1 (Offshore) Greenland halibut	SA0+1 Northern shrimp East Greenland Northern shrimp	
Small	3NOPs White hake 3NO Witch flounder 3M American plaice		1A Greenland halibut inshore in Uummannaq	SA1 Spotted Wolffish
Depleted	3LNO American plaice 3NO Cod 3LNO Northern shrimp 3M Northern shrimp[1] 6G Alfonsino		3O Redfish	SA1 Redfish SA1 Atlantic Wolffish
Unknown	SA2+3 Roughhead grenadier 3NO Capelin			SA3+4 Northern shortfin squid 3LNOPs Thorny skate 1A Greenland halibut inshore in Disko Bay 1A Greenland halibut inshore in Upernavik

[1] Fishing mortality may not be the main driver of biomass for this stock.
For many stocks, lack of surveys in recent years has impacted assessments.

2. Vacant Designated Experts

SC notes that four Designated Expert positions are vacant (3NOPs white hake, 3LNOPs thorny skate, SA 3+4 squid and 3LNO EPU) and need to be filled.

3. Leaf Plot Script

SC discussed the template leaf script that had been developed to produce plots for the Precautionary Approach Framework (PAF) that had been integrated into the NAFOdown package (https://github.com/nafc-assess/NAFOdown). Confusion with interpreting the plots was noted, and several suggestions on improving interpretability and readability were discussed. A subgroup to address the refinement of the plots was created and will work to improve the plots intersessionally.

4. Other Business

There was no other business.

V. ADJOURNMENT

The meeting was adjourned on 11th June 2026.

APPENDIX V. AGENDA – SCIENTIFIC COUNCIL MEETING, 29 MAY – 11 JUNE 2026

Scientific Council Meeting, 29 May -11 June 2026

I. Opening (Scientific Council Chair: Diana González-Troncoso)
   1. Appointment of Rapporteur
   2 Presentation and Report of Proxy Votes
   3. Adoption of Agenda
   4. Attendance of Observers
   5. Appointment of Designated Experts
   6. Plan of Work
   7. Housekeeping issues

II. Review of Scientific Council Recommendations in 2025

III. Fisheries Environment (STACFEN Chair: VACANT. A Chair must be nominated before the commencement of the meeting for the Committee to convene)
   1. Opening
   2. Appointment of Rapporteur
   3. Adoption of Agenda
   4. Review of Recommendations in 2025
   5. Invited speakers
   6. Department of Fisheries and Oceans Canada, Oceans Science Branch, Marine Environmental Data Section (MEDS) Report for 2025
   7. Review of the physical, biological and chemical environment in the NAFO Convention Area during 2025
   8. Formulation of recommendations based on environmental conditions during 2025
   9. Other Matters
   10. Adjournment

IV. Publications (STACPUB Chair: Rick Rideout)
   1. Opening
   2. Appointment of Rapporteur
   3. Adoption of Agenda
   4. Review of Recommendations in 2025
   5. Review of Publications
      a) Annual Summary
         i) Journal of Northwest Atlantic Fishery Science (JNAFS)
         ii) Scientific Council Studies
         iii) Scientific Council Reports
   6. Other Matters
   7. Adjournment

V. Research Coordination (STACREC Chair: Mark Simpson)
   1. Opening
   2. Appointment of Rapporteur
   3. Review of Recommendations in 2025
   4. Invited speaker (Dr. Casper Berg)
   5. Fishery Statistics
      a) Progress report on Secretariat activities in 2025/2026
         i) Presentation of catch estimates from the CESAG, daily catch reports and STATLANT 21A and 21B
         ii) Review of STATLANT 21B submission form
   6. Research Activities
      a) Biological sampling

i) Report on activities in 2025/2026
ii) Report by National Representatives on commercial sampling conducted
iii) Report on data availability for stock assessments (by Designated Experts)

b) Biological surveys
i) Review of survey activities in 2025 and early 2026 (by National Representatives and Designated Experts)
ii) Surveys planned for 2026 and early 2027

c) Tagging activities
d) Other research activities

7. Review of SCR and SCS Documents
8. Other Matters
a) Silver hake
9. Adjournment

VI. Fisheries Science (STACFIS Chair: José De Oliveira)

I. Opening
II. General Review of Catches and Fishing Activity
III. Stock Assessments
1. Greenland halibut (*Reinhardtius hippoglossoides*) in SA 0+1 offshore (monitor)
2. Greenland halibut (*Reinhardtius hippoglossoides*) Div. 1A inshore Divs. 1BC inshore, Div. 1D inshore and Divs. 1EF inshore (full assessment)
3. Demersal redfish and deep-sea redfish (*Sebastes* spp.) in SA 1 (full assessment)
4. Wolffish in SA 1 (full assessment)
5. Golden redfish (*Sebastes norvegicus* aka *S. marinus*) in Div. 3M (monitor)
6. Cod (*Gadus morhua*) in Div. 3M (full assessment)
7. Redfish (*Sebastes mentella* and *Sebastes fasciatus*) in Div. 3M (full assessment)
8. American plaice (*Hippoglossoides platessoides*) in Div. 3M (full assessment)
9. Cod (*Gadus morhua*) in Divs. 3NO (monitor)
10. Redfish (*Sebastes mentella* and *Sebastes fasciatus*) in Divs. 3LN (full assessment)
11. American plaice (*Hippoglossoides platessoides*) in Divs. 3LNO (full assessment)
12. Yellowtail flounder (*Limanda ferruginea*) in Divs. 3LNO (monitor)
13. Witch flounder (*Glyptocephalus cynoglossus*) in Divs. 3NO (full assessment)
14. Capelin (*Mallotus villosus*) in Divs. 3NO (monitor)
15. Redfish (*Sebastes mentella* and *Sebastes fasciatus*) in Div. 3O (monitor)
16. Thorny skate (*Amblyraja radiata*) in Divs. 3LNO and Subdiv. 3Ps (full assessment)
17. White hake (*Urophycis tenuis*) in Divs. 3NO and Subdiv. 3Ps (monitor)
18. Roughhead grenadier (*Macrourus berglax*) in SA 2 and 3 (monitor)
19. Greenland halibut (*Reinhardtius hippoglossoides*) in SA 2 + Divs. 3KLMNO (in MSE process: monitor, COM requests #2 and #4)
20. Northern shortfin squid (*Illex illecebrosus*) in SA 3+4 (monitor)
21. Splendid alfonsino (*Beryx splendens*) in SA 6 (monitor)

IV. Other Matters
a) FIRMS Classification for NAFO Stocks
b) Vacant Designated Experts. How to proceed with full assessments/monitoring with DE vacancies.
c) Interim Monitoring Reports (IMRs)
d) Leaf Plot Script
e) Other Business

V. Adjournment

VII. Management Advice and Responses to Special Requests (See Annex 1)

1. Commission (Annex 1)

a) Request for Advice on TACs and Other Management Measures (request #1, Annex 1)

<u>For 2027</u>
- cod in Div. 3M

<u>For 2027 and 2028</u>
- redfish in Div. 3M
- thorny skate in Divs. 3LNO
- witch flounder in Divs. 3NO
- redfish in Divs. 3LN
- northern shrimp in 3M
- American plaice in Divs. 3LNO

<u>For 2027, 2028 and 2029</u>
- American plaice in Div. 3M

b) Monitoring of Stocks for which Multi-year Advice was provided in 2023-2025 or by interim monitoring only (request #1)
- yellowtail flounder in Divs. 3LNO
- cod in Divs. 3NO
- capelin in Divs. 3NO
- alfonsino stocks in Subarea 6
- roughhead grenadier in Subareas 2 and 3
- white hake in Divs. 3NO
- redfish in Div. 3O
- northern shortfin squid in Subareas 3+4

c) Special Requests for Management Advice

i) The Commission requests the Scientific Council to monitor the status of Greenland halibut in Subarea 2 + Divisions 3KLMNO annually to compute the TAC using the agreed Management Procedure and determine whether exceptional circumstances are occurring. If exceptional circumstances are occurring, the exceptional circumstances protocol will provide guidance on what steps should be taken (request #2).

ii) The Commission requests that Scientific Council, in addition to the 2026 3LN redfish stock assessment, continue to advance work on the 3LN redfish MSE processes during 2025-2026 (request #3).

iii) As practicable and taking into account Scientific Council capacity constraints, develop stock summary sheets for NAFO managed stocks that are evaluated using MSE processes (request #4).

iv) In relation to the Ecosystem Roadmap as a whole, the Commission requests the Scientific Council, with input from the WG-EAFFM, to continue work on the development of a reference document detailing the ecosystem roadmap, for completion by the 2026 Annual Meeting (request # 5).

v) In relation to the habitat impact assessment component of the Roadmap (VME and SAI analyses), the Commission requests that Scientific Council to:

a) Continue to progress work on the centralized data repository using ArcGIS online to host the data and data-products for scientific advice, in conjunction with the NAFO Secretariat (request #6a).

b) Work towards the reassessment of VMEs and impact of bottom fisheries on VMEs for 2027; including potential management options in the reassessment of bottom fisheries (request #6b).

c) Develop materials on the potential of submitting NAFO coral bottom fishing closed areas as OECMs for discussion at the 2026 WG-EAFFM meeting (request #6c).

vi) The Commission requests the Scientific Council to continue to develop reference points to facilitate the implementation of the Revised NAFO Precautionary Approach Framework, for stocks that currently do not have them (request #7).

vii) In relation to its workload, the Commission requests the Scientific Council to continue to update the 3-5 year work plan, which reflects requests arising from the 2025 Annual Meeting, other multi-year stock assessments and other scientific inquiries already planned for the near future and, as much as possible, monitor and estimate future workload (request #8).

viii) The Commission requests the Scientific Council to explore the development of a sampling plan to conduct selectivity trials in the cod fishery in 3M. The objective is to collect data to test the effectiveness and impact of using sorting grids to improve the selectivity of cod and other species (request #9).

ix) The Commission requests the Scientific Council, as workload allows, in consultation with the NAFO Secretariat, to draft a scoping document for a potential in-person meeting to explore approaches for further integrating information related to climate change throughout Scientific Council operations. This scoping document should identify the scientific expertise needed both within and outside Scientific Council and potential financial and workload implications (request #10).

x) Considering a new science and management framework for Northern shrimp in Divisions 2J3KLNO (SSAR) developed and peer-reviewed by Canada, which includes NAFO divisions 3LNO, the Commission tasks the Scientific Council to assess and consider the operational model underlining the MSE developed for the SSAR stock of shrimp by Canada. This assessment will be presented to the Commission at the 2026 Annual Meeting to inform management decisions (request #11).

xi) The Commission requests the Scientific Council to consider a plan for carrying out benchmark assessments and include this in the 3-5 year work plan (request #12).

2. Coastal States
   a) Request by Denmark (Greenland) for Advice on Management in 2026 (Annex 2)
      - Greenland halibut SA 1 (inshore)
      - wolffish in SA 1
      - demersal redfish and deep-sea redfish (*Sebastes* spp.) in SA 1
      - East Greenland Northern shrimp
      - West Greenland Northern shrimp

   b) Request by Canada for Advice on Management in 2026
      - Northern shrimp in SA 1 and Div. 0A

   c) Request by Canada and Greenland for Monitoring of Stocks for which Multi-year Advice was provided in 2024 or 2025 (Annex 2, Annex 3)
      - Greenland halibut, offshore

VIII. Review of Future Meetings Arrangements
1. Scientific Council and STACFIS Shrimp Assessment Meeting, 15-17 September 2026
2. Scientific Council, 21-25 September 2026

3. WG-ESA, 10-19 November 2026
4. Scientific Council, June 2027
5. Scientific Council and STACFIS Shrimp Assessment Meeting, 2027
6. Scientific Council, September 2027
7. WG-ESA, November 2027
8. NAFO/ICES Joint Groups
   a) NIPAG
   b) WG-DEC
   c) WG-HARP

IX. Arrangements for Special Sessions
1. Topics for future special sessions
2. Recently attended special sessions

X. Meeting Reports
1. Working Group on Ecosystem Science and Assessment (WG-ESA), 4-12 November 2025
2. Report from ICES-NAFO Working Group on Deepwater Ecosystems (WG-DEC), 23-27 March 2026
4. NAFO Joint Commission-Scientific Council Working Group on Risk-Based Management Strategies (WG-RBMS), 09 April 2026
5. Meetings attended by the Secretariat

XI. Review of Scientific Council Working Procedures/Protocol
1. General Plan of Work for September 2026 Annual Meeting

XII. Other Matters
1. Designated experts
2. Election of Chairs
3. Budget items
4. Rules of procedure
5. Performance review
6. ETP species
7. Issues with the table in Annex A
8. NAFO Traffic Light
9. Other Business

XIII. Adoption of Committee Reports
1. STACFEN (if convened)
2. STACREC
3. STACPUB
4. STACFIS

XIV. Scientific Council Recommendations to Commission

XV. Adoption of Scientific Council Report

XVI. Adjournment

ANNEX 1. COMMISSION'S REQUEST FOR SCIENTIFIC ADVICE ON MANAGEMENT IN 2027 AND BEYOND OF CERTAIN STOCKS IN SUBAREAS 2, 3 AND 4 AND OTHER MATTERS

(from NAFO SCS Doc. 26/01)

Following a request from the Scientific Council, the Commission agreed that items 1 and 2 should be the priority for the June 2026 Scientific Council meeting subject to resources.

1. The Commission requests that the Scientific Council provide advice for the management of the fish stocks below according to the assessment frequency presented below. In line with the Revised NAFO Precautionary Approach Framework (COM Doc. 25-16) the Commission should be informed by the range of options and associated risks provided by the Scientific Council. The Commission will decide upon the acceptable risk level in the context of the entirety of the Scientific Council advice for each stock guided and as foreseen by the NAFO Precautionary Approach. The Commission acknowledges that full assessment cannot be run when a DE is not nominated for a stock.

Advice should be provided using the guidance provided in **Annex A**, or using the predetermined Management Procedure in the cases where they exist (currently Greenland halibut 2+3KLMNO). For Division 3M shrimp supplementary advice in terms of fishing-days could also be considered as appropriate. To implement this schedule of assessments, the Scientific Council is requested to conduct a full assessment of these stocks as follows:

Yearly basis	Two-year basis	Three-year basis	Interim Monitoring Only
Cod in Division 3M	Redfish in Division 3M Thorny skate in Divisions 3LNO Witch flounder in Divisions 3NO Redfish in Divisions 3LN Yellowtail flounder in Divisions 3LNO Northern shrimp in Division 3M White hake in Divisions 3NO American plaice in Divisions 3LNO	American plaice in Division 3M Northern shortfin squid in Subareas 3+4 Redfish in Division 3O Cod in Divisions 3NO	Subarea 6 Alfonsino Subareas 2-3 Roughhead Grenadier Capelin in Divisions 3NO

- In 2026, advice should be provided for 2027 for: Cod in Division 3M
- In 2026, advice should be provided for 2027 and 2028 for: Redfish in Division 3M, Thorny skate in Divisions 3LNO, Witch flounder in Divisions 3NO, Redfish in Divisions 3LN, Northern shrimp in Division 3M, American plaice in 3LNO.
    - With respect to Northern shrimp in Division 3M, Scientific Council is requested to provide its advice to the Commission prior to the 2026 Annual Meeting based on the survey data up to and including 2026.
- In 2026, advice should be provided for 2027, 2028 and 2029 for: American plaice in Division 3M

The Commission also requests the Scientific Council to continue to monitor the status of all other stocks annually and, should a significant change be observed in stock status (e.g. from surveys) or in bycatch in other fisheries, provide updated advice as appropriate.

2. The Commission requests the Scientific Council to monitor the status of Greenland halibut in Subarea 2 + Divisions 3KLMNO annually to compute the TAC using the agreed Management Procedure and determine whether exceptional circumstances are occurring. If exceptional circumstances are occurring, the exceptional circumstances protocol will provide guidance on what steps should be taken.

3. The Commission requests that Scientific Council, in addition to the 2026 3LN redfish stock assessment, continue to advance work on the 3LN redfish MSE processes during 2025-2026.

4. As practicable and taking into account Scientific Council capacity constraints, develop stock summary sheets for NAFO managed stocks that are evaluated using MSE processes.

5. In relation to the Ecosystem Roadmap as a whole, the Commission requests the Scientific Council, with input from the WG-EAFFM, to continue work on the development of a reference document detailing the ecosystem roadmap, for completion by the 2026 Annual Meeting.

6. In relation to the habitat impact assessment component of the Roadmap (VME and SAI analyses), the Commission requests that Scientific Council to:

    a. Continue to progress work on the centralized data repository using ArcGIS online to host the data and data-products for scientific advice, in conjunction with the NAFO Secretariat.

    b. Work towards the reassessment of VMEs and impact of bottom fisheries on VMEs for 2027; including potential management options in the reassessment of bottom fisheries.

    c. Develop materials on the potential of submitting NAFO coral bottom fishing closed areas as OECMs for discussion at the 2026 WG-EAFFM meeting.

7. The Commission requests the Scientific Council to continue to develop reference points to facilitate the implementation of the Revised NAFO Precautionary Approach Framework, for stocks that currently do not have them.

8. In relation to its workload, the Commission requests the Scientific Council to continue to update the 3-5 year work plan, which reflects requests arising from the 2025 Annual Meeting, other multi-year stock assessments and other scientific inquiries already planned for the near future and, as much as possible, monitor and estimate future workload.

9. The Commission requests the Scientific Council to explore the development of a sampling plan to conduct selectivity trials in the cod fishery in 3M. The objective is to collect data to test the effectiveness and impact of using sorting grids to improve the selectivity of cod and other species.

10. The Commission requests the Scientific Council, as workload allows, in consultation with the NAFO Secretariat, to draft a scoping document for a potential in-person meeting to explore approaches for further integrating information related to climate change throughout Scientific Council operations. This scoping document should identify the scientific expertise needed both within and outside Scientific Council and potential financial and workload implications.

11. Considering a new science and management framework for Northern shrimp in Divisions 2J3KLNO (SSAR) developed and peer-reviewed by Canada, which includes NAFO divisions 3LNO, the Commission tasks the Scientific Council to assess and consider the operational model underlining the MSE developed for the SSAR stock of shrimp by Canada. This assessment will be presented to the Commission at the 2026 Annual Meeting to inform management decisions.

12. The Commission requests the Scientific Council to consider a plan for carrying out benchmark assessments and include this in the 3-5 year work plan.

ANNEX A: Guidance for providing advice on Stocks Assessed

The Commission requests the Scientific Council to consider the following in assessing and projecting future stock levels for those stocks listed above. These evaluations should provide the information necessary for the Commission to consider the balance between risks and yield levels, in determining its management of these stocks:

Stochastic short-term projections (3 years) should be performed with the F levels that are included in the risk table from the Revised PA Framework (Table 1 below), based on the point estimate of biomass. The first year of the projection should assume a catch equal to the agreed TAC for that year. In instances where Scientific Council expects catches to be significantly different from the agreed TAC, an additional projection could be provided based on the best available catch estimation.

In relation to Tier 1 of the Roadmap Scientific Council should provide annually catch information in relation to 2TCI, including recent cumulative catch levels and a scoping of expected cumulative catch levels. Ecosystem summary sheets should be monitored annually and updated on a five-year cycle.

For stocks assessed with a production model, the advice should include updated time series or plots of:

- Catch and TAC of recent years
- Catch to relative biomass
- Relative Biomass
- Relative Fishing mortality
- Stock trajectory against precautionary approach reference points

For stock assessed with an age-structured model, information should be provided on stock size, spawning stock sizes, recruitment prospects, historical fishing mortality. Graphs and/or tables should be provided for all of the following for the longest time-period possible:

- historical yield and fishing mortality;
- spawning stock biomass and recruitment levels;
- Stock trajectory against precautionary approach reference points

For stocks for which only general biological and/or catch data are available, few standard criteria exist on which to base advice. The stock status should be evaluated in the context of management requirements for long-term sustainability and the advice provided should be consistent with the precautionary approach.

The following graphs should be presented for the longest time-period possible:

- catch and TAC of recent years
- length distributions
- time trends of survey abundance estimates
- an age or size range chosen to represent the spawning population
- an age or size-range chosen to represent the exploited population
- recruitment proxy or index for an age or size-range chosen to represent the recruiting population.
- fishing mortality proxy, such as the ratio of reported commercial catches to a measure of the exploited population.
- stock trajectory against precautionary approach reference points

In all cases any additional information the Scientific Council deems appropriate should be provided.

Table 1. The Revised NAFO Precautionary Approach Framework risk table.

y current year (year in which the assessment is made, data until year y-1)

	Yield			$P(F>F_{lim})$			$P(B<B_{lim})$				$P(F>F_{target})$			$P(B<B_{trigger})$				P(By+3 > By)	(By+3-By)/By
F in y+1 and following years	Yield y (50%)	Yield y+1 (50%)	Yield y+2 (50%)	y	y+1	y+2	y	y+1	y+2	y+3	y	y+1	y+2	y	y+1	y+2	y+3		
Critical Zone																			
F=0	t	t	t	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
F=X% current*	t	t	t	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
F current	t	t	t	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
Cautious Zone																			
F lower edge leaf	t	t	t	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
F midrib leaf	t	t	t	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
F upper edge leaf	t	t	t	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
Healthy Zone																			
F=0.75Fmsy	t	t	t	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
Ftarget=0.85Fmsy	t	t	t	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
Flim=Fmsy	t	t	t	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%

*X% may vary stock by stock. In the future, this framework may be modified to include F bycatch.
The number of years in the risk projections table will be the same as the years of advice.

ANNEX 2. DENMARK (ON BEHALF OF GREENLAND) REQUESTS FOR SCIENTIFIC ADVICE -2027

(from NAFO SCS Doc. 26/03)

Denmark (on behalf of Greenland) (hereafter Greenland) hereby request scientific advice on management in 2027 of certain stocks in NAFO Subareas 0 and 1. Greenland requests the Scientific Council for advice on the following species:

1. Golden Redfish and Demersal Deep-Sea Redfish

Advice on Golden redfish (*Sebastes norvegicus*) and demersal deep-sea redfish (*Sebastes mentella*) in Subarea 1 was given in June 2023 for 2024 and beyond. The Scientific Council is requested to provide catch advice for 2027 to 2029.

2. Atlantic Wolffish and Spotted Wolffish

Advice on Atlantic Wolffish (*Anarhichas lupus*) and Spotted Wolffish (*Anarhichas minor*) in Subarea 1 was given in June 2023 for 2024-2026. The Scientific Council is requested to provide catch advice for 2027 to 2029.

3. Greenland Halibut, Offshore

Advice on Greenland Halibut, Offshore in Subareas 0 and 1 was given in 2025 for 2026 and 2027. The Scientific Council is requested to continue its monitoring of the stock and provide updated advice in the event of significant changes in stock levels.

In addition, Greenland specifically requests the catch scenarios for 35.328 tonnes (F_{MSY} 2026) and F_{target} be updated for 2027-2029, with associated probability that biomass in the end of 2027-2029 is lower than 1) $B_{trigger}$ and 2) B_{lim}, i.e. $p(B<B_{trigger})$ and $p(B<B_{lim})$.

4. Greenland Halibut, Inshore, West Greenland

Advice on the inshore stocks of Greenland Halibut in Subarea 1 was given in 2024 for 2025-2026. The Scientific Council is requested to provide advice on catch levels for Subarea 1 in division 1A, inshore (Disko Bay, Uummannaq and Upernavik) for 2027 and 2028.

5. Northern Shrimp, West Greenland

Greenland requests the Scientific Council to provide, before November 2026, advice on the scientific basis for management of Northern Shrimp (*Pandalus borealis*) in Subareas 0 and 1 in 2027. The advice should be in line with Greenland's stated management objective of maintaining a mortality risk of no more than 35% of exceeding Z_{msy} in the first-year prediction, and to provide a catch option table ranging with 5,000 t increments. Future catch options should be provided for as many years as data allows for. Results should include risk analysis of biomass falling below B_{msy}, $B_{trigger}$ and B_{lim}.

6. Northern Shrimp, East Greenland

Scientific Council is, requested to provide advice on the scientific basis for management of Northern Shrimp (*Pandalus borealis*) in Denmark Strait and adjacent waters east of southern Greenland in 2027 for as many years ahead as data allows. Scientific Council is requested to give a catch advice at a level corresponding to $F_{target.}$ Results should include a catch option table ranging with 500 t increments, including risk analysis of fishing mortality falling below F_{msy}, F_{target} and biomass below B_{msy}, $B_{trigger}$ and B_{lim}.

ANNEX 3. CANADA'S COASTAL STATE REQUEST TO NAFO'S SCIENTIFIC COUNCIL FOR SCIENTIFIC ADVICE – 2027

(from NAFO SCS Doc. 26/02)

Canada would like to submit its request to NAFO's Scientific Council for advice on the following two species:

1. Greenland halibut (Subarea 0+1 (offshore))

Canada requests that the Scientific Council monitor the status of Greenland halibut (Subarea 0 + 1 (offshore), and, should a significant change be observed (e.g., based on results from surveys or commercial catch data), provide updated advice as appropriate, in the same format that was done in 2025 (i.e., updating the risk table in the new NAFO PA framework). A significant change would be considered the realized catch data far exceeding the set TAC level despite normal fishing effort or if the survey index is far below the projected index.

2. Northern shrimp (Subareas 1 and Division 0A)

Canada requests that the Scientific Council consider the following options in assessing and projecting future stock levels for Northern shrimp (*Pandalus borealis*) in Subarea 1 and Division 0A:

The status of the stock should be determined and risk-based advice provided for catch options corresponding to Zmsy in 5,000t increments with forecasts for 2027 to 2029 (inclusive). These options should be evaluated in relation to Canada's Harvest Strategy (2022 revised version attached) and NAFO's Revised Precautionary Approach Framework.

Presentation of the results should include graphs and/or tables related to the following:

- Historical and current yield, biomass relative to Bmsy, total mortality relative to Zmsy, and recruitment (or proxy) levels for the longest time period possible;
- Total mortality (Z) and fishable biomass for a range of projected catch options (as noted above) for the years 2027 to 2029. Projections should include both catch options and a range of effective cod predation biomass levels considered appropriate by the Scientific Council. Results should include risk analyses of falling below: Bmsy, 80% Bmsy and Blim (30% Bmsy), and of being above Zmsy based on the 3-year projections, consistent with the Harvest Decision Rules in Canada's Harvest Strategy; and
- Total area fished for the longest time period possible.

Please provide the advice relative to Canada's Harvest Strategy as part of the formal advice (i.e., grey box in the advice summary sheet).

PROVISIONAL TIMETABLE

Scientific Council Meeting, 29 May -11 June 2026

Date	Time	Schedule
29 May (Friday)	0900	Registration, network connection
	0900-0930	SC Executive
	1000-1030	SC Opening
	1030-1200	STACFIS (Catch WG report, status of documentation, interim monitoring reports)
	1200-1330	Break
	1330-1600	STACPUB
	1600-1800	SC/STACFIS
30 May (Saturday)	0900-1800	STACFEN
31 May (Sunday)	No meetings	
01 June (Monday)	0900-1200	STACREC
	1330-1800	STACFIS/SC
02 June (Tuesday)	0900-1800	STACFIS/SC
03 June (Wednesday)	0900-1800	STACFIS/SC
04 June (Thursday)	0900-1800	STACFIS/SC
05 June (Friday)	0900-1800	STACFIS/SC
06 June (Saturday)	0900-1800	STACFIS Reports
07 June (Sunday)	No meetings	
08 June (Monday)	0830-0900	Scientific Council Executive
	0900-1800	Scientific Council (Standing Committee Reports)
09 June (Tuesday)	0900-1800	Scientific Council
10 June (Wednesday)	0900-1800	Scientific Council
11 June (Thursday)	0900-1200	Scientific Council (advice and adoption of reports)

APPENDIX VI. EXPERTS FOR PRELIMINARY ASSESSMENT OF CERTAIN STOCKS

Designated Experts for 2027:

From the Science Branch, Northwest Atlantic Fisheries Centre, Department of Fisheries and Oceans, St. John's, Newfoundland & Labrador, Canada

Cod in Div. 3NO	Rick Rideout	rick.rideout@dfo-mpo.gc.ca
American Plaice in Div. 3LNO	Laura Wheeland	laura.wheeland@dfo-mpo.gc.ca
Witch flounder in Div. 3NO	Katherine Skanes	katherine.skanes@dfo-mpo.gc.ca
Yellowtail flounder in Div. 3LNO	Laura Wheeland	laura.wheeland@dfo-mpo.gc.ca
Greenland halibut in SA 2+3KLMNO	Paul Regular	paul.regular@dfo-mpo.gc.ca
Northern shrimp in Div. 3LNO	Nicolas Le Corre	nicolas.lecorre@dfo-mpo.gc.ca

From the Department of Fisheries and Oceans, Winnipeg, Manitoba, Canada

Greenland halibut in SA 0+1 (offshore)	Kevin Hedges	kevin.hedges@dfo-mpo.gc.ca

From the Department of Fisheries and Oceans, Ottawa, Ontario, Canada

Redfish Div. 3O	Danny Ings	danny.ings@dfo-mpo.gc.ca

From the Instituto Español de Oceanografía, Vigo (Pontevedra), Spain

Roughhead grenadier in SA 2+3	Fernando González-Costas	fernando.gonzalez@ieo.csic.es
Splendid alfonsino in Subarea 6	Fernando González-Costas	fernando.gonzalez@ieo.csic.es
Cod in Div. 3M	Irene Garrido Fernández	irene.garrido@ieo.csic.es
Northern Shrimp in Div. 3M	Jose Miguel Casas Sánchez	mikel.casas@ieo.csic.es
Ecosystem Designated Expert 3M	Diana González-Troncoso	diana.gonzalez@ieo.csic.es

From the Instituto Nacional de Recursos Biológicos (INRB/IPMA), Lisbon, Portugal

American plaice in Div. 3M	Ricardo Alpoim	ralpoim@ipma.pt
Golden redfish in Div. 3M	Ricardo Alpoim	ralpoim@ipma.pt
Redfish in Div. 3M	Ricardo Alpoim	ralpoim@ipma.pt
Redfish in Div. 3LN	Patricia Gonçalves	patricia@ipma.pt

From the Greenland Institute of Natural Resources, Nuuk, Greenland

Demersal Redfish in SA1	Rasmus Nygaard	rany@natur.gl
Wolfish in SA1	Rasmus Nygaard	rany@natur.gl
Greenland halibut in Div. 1 inshore	Rasmus Nygaard	rany@natur.gl
Northern shrimp in SA 0+1	AnnDorte Burmeister	anndorte@natur.gl
Northern shrimp in Denmark Strait	Tanja B. Buch	TaBb@natur.gl

From Knipovich Polar Research Institute of Marine Fisheries and Oceanography (PINRO), Russian Federation

Capelin in Div. 3NO	Konstantin Fomin	fomin@pinro.ru

Designated Expert Vacancies

Ecosystem Designated Expert 3LNO	VACANT
Northern Shortfin Squid in SA 3 & 4	VACANT
Thorny skate in Div. 3LNO	VACANT
White hake in Div. 3NO	VACANT

APPENDIX VII. LIST OF SCR AND SCS DOCUMENTS

SCR Documents			
Serial No.	**Doc. No.**	**Author(s)**	**Title**
N7710	SCR Doc. 26/001	Irene Garrido, Diana González-Troncoso, Fernando González-Costas, Esther Román and Lupe Ramilo	Results of the Spanish survey in NAFO Div. 3NO
N7712	SCR Doc. 26/002	R.M. Rideout, L. Wheeland, P. Regular, K. Skanes, M. Koen-Alonso, L. Simms	Canadian (Newfoundland And Labrador Region) Multi-Species Research Vessel Bottom Trawl Survey Report for Surveys Conducted in 2025
N7713	SCR Doc. 26/003	Diana González-Troncoso, José Miguel Casas-Sánchez, Irene Garrido, Esther Román and Raimundo Blanco	Results from Bottom Trawl Survey on Flemish Cap of June-July 2025
N7715	SCR Doc. 26/004		**Retracted**
N7717	SCR Doc. 26/005	E. Román-Marcote and I. Garrido	Results for the Spanish Survey in the NAFO Regulatory Area of Division 3L for the period 2003-2025
N7721	SCR Doc. 26/006	J. M. Casas, E. Román-Marcote, J.L. del Rio and V. M. Pajón	Northern Shrimp (*Pandalus borealis*, Krøyer) from EU-Spain Bottom Trawl Survey 2025 in NAFO Div. 3LNO
N7723	SCR Doc. 26/007	R.M. Rideout, M. Koen-Alonso	Implications of the Revised NAFO PA Framework for the Scientific Council traffic light approach to the provision of scientific advice
N7726	SCR Doc. 26/008	D S Butterworth and R A Rademeyer	Modelling 3LN redfish with a Schaefer model including one recruitment pulse
N7727	SCR Doc. 26/009	Rosario Domínguez-Petit1, Mónica González-Castrillón1 and Dolores Garabana	Abnormal gonochoristic inter-sex in Silver hake (*Merluccius bilinearis*) from Div. 3N
N7728	SCR Doc. 26/010	Tatiana Muzychka, Patrícia Gonçalves, Ricardo Alpoim, Paula Simões, Sandra. M. Aleixo	Estimation of a biomass limit reference point for beaked redfish (*S. mentella and S. fasciatus*) in NAFO Division 3M
N7730	SCR Doc. 26/011	Rasmus Nygaard & Henrik Christiansen	Biomass and Abundance of Demersal Fish Stocks off West and East Greenland estimated from the Greenland Institute of Natural Resources (GINR) Shrimp and Fish Survey (SFW), 1990-2020, and 2022-2025.
N7731	SCR Doc. 26/012	Henrik Christiansen, Rasmus Nygaard	Results for Greenland halibut survey in NAFO Divisions 1C-1D for the period 1997-2017, 2019 and 2022-2025
N7732	SCR Doc. 26/013	Rasmus Nygaard and Henrik Christiansen	Biomass and Abundance of Demersal Fish Stocks in the Nuuk fjord and Ameralik fjord derived from The GINR Shrimp and fish inshore (SFI) survey.
N7733	SCR Doc. 26/014	Rasmus Nygaard, Henrik Christiansen	The Disko Bay trawl and gillnet survey results for Greenland halibut
N7734	SCR Doc. 26/015	Rasmus Nygaard, Henrik Christiansen	The Upernavik gillnet survey
N7735	SCR Doc. 26/016	Rasmus Nygaard, Henrik Christiansen	The Uummannaq gillnet survey
N7736	SCR Doc. 26/017	Rasmus Nygaard, Henrik Christiansen	Commercial data from the Greenland halibut fishery in Disko Bay
N7737	SCR Doc. 26/018	Rasmus Nygaard, Henrik Christiansen	Commercial data from the Greenland halibut fishery in the Upernavik area
N7738	SCR Doc. 26/019	Rasmus Nygaard, Henrik Christiansen	Commercial data from the Greenland halibut fishery in Uummannaq fjord

N7739	SCR Doc. 26/020	Fernando González-Costas	An Assessment of American Plaice (*Hippoglossoides platessoides*) in NAFO Division 3M
N7740	SCR Doc. 26/021	K.J. Hedges	Report on Greenland halibut (*Reinhardtius hippoglossoides)* caught during the 2025 trawl survey in Subarea 0
N7742	SCR Doc. 26/022	Rasmus Nygaard	Assessment of Demersal Redfish in NAFO Subarea 1
N7743	SCR Doc. 26/023	Irene Garrido, Diana González-Troncoso and Fernando González-Costas	Assessment of the Cod Stock in NAFO Division 3M
N7744	SCR Doc. 26/024	Henrik Christiansen, Rasmus Nygaard	Evaluation of surplus production modelling in continuous time (SPiCT) for Greenland halibut in NAFO Division 1A Uummannaq
N7745	SCR Doc. 26/025	Rasmus Nygaard, Henrik Christiansen	An assessment of wolffish in NAFO subarea 1.
N7746	SCR Doc. 26/026	P. Gonçalves, R. Alpoim and A. Perreault	An assessment of beaked redfish (*S. mentella and S. fasciatus*) based on RV data in NAFO Division 3LN
N7747	SCR Doc. 26/027	P. Gonçalves and R. Alpoim	Age length keys comparison for beaked redfish (*S. mentella and S. fasciatus*) in NAFO Division 3M
N7748	SCR Doc. 26/028	Mariano Koen-Alonso, Nicholas Gullage, and Hannah Munro	Catch levels for the scoping of the ecosystem sustainability of catches in 2026-2027
N7749	SCR Doc. 26/029	K.J. Hedges and H. Christiansen	Data available for the Greenland Halibut Stock Component in NAFO Subarea 0 + 1 (offshore)

SCS Documents			
Serial No.	**Doc. No.**	**Author**	**Title**
N7706	SCS Doc. 26/01	NAFO	The Commission's Request for Scientific Advice on Management in 2027 and Beyond of Certain Stocks in Subareas 2, 3 and 4 and Other Matters
N7708	SCS Doc. 26/02	Canada	Canada's Coastal State Request to NAFO's Scientific Council for Scientific Advice – 2027
N7709	SCS Doc. 26/03	Denmark (on behalf of Greenland)	Denmark (on behalf of Greenland) Coastal State Request for Scientific Advice – 2027
N7711	SCS Doc. 26/04	Japan Fisheries Research and Education Agency,	National Research Report of Japan (2026)
N7714	SCS Doc. 26/05	Konstantin Fomin, Maria Pochtar	Russian Research Report for 2025
N7716	SCS Doc. 26/06	F. González-Costas, G. Ramilo, E. Román, J. Lorenzo, D. González-Troncoso, M. Sacau, P. Duran, J. L. del Rio, M. Casas and I. Garrido.	Spanish Research Report for 2025
N7722	SCS Doc. 26/07	Katherine Skanes and Mark Simpson	Canadian Research Report (Newfoundland and Labrador Region) for 2025
N7724	SCS Doc. 26/08	Karl Michael Werner, Erik Sulanke and C. Stransky	German Research Report for 2025
N7725	SCS Doc. 26/09	Luis Ridao Cruz	Faroese Research Report 2025
N7729	SCS Doc. 26/10	R. Alpoim, S. Dores and P. Gonçalves	Portuguese Research Report for 2025
N7741	SCS Doc. 26/11	Greenland Institute of Natural Resources	Denmark/Greenland Research Report for 2025
N7750	SCS Doc. 26/12	NAFO	Report of the Scientific Council, 29 May - 11 June 2026

APPENDIX VIII. LIST OF PARTICIPANTS, 29 MAY – 11 JUNE 2026

CHAIR	
Name	**Institute/Affiliation**
González-Troncoso, Diana	Instituto Español de Oceanografía
CANADA	
In-person	
Dwyer, Karen	Fisheries and Oceans Canada
Hedges, Kevin	Fisheries and Oceans Canada
Koen-Alonso, Mariano	Fisheries and Oceans Canada
Krohn, Martha	Fisheries and Oceans Canada
Regular, Paul	Fisheries and Oceans Canada
Rideout, Rick *Chair of STACPUB*	Fisheries and Oceans Canada
Simpson, Mark *Vice-Chair of Scientific Council and Chair of STACREC*	Fisheries and Oceans Canada
Skanes, Katherine	Fisheries and Oceans Canada
Trueman, Samantha	Fisheries and Oceans Canada
Wheeland, Laura	Fisheries and Oceans Canada
Virtual	
Baker, Krista	Fisheries and Oceans Canada
Cox, Sean	Landmark Fisheries
Duprey, Nicholas	Fisheries and Oceans Canada
Gullage, Nicholas	Fisheries and Oceans Canada
Ings, Danny	Fisheries and Oceans Canada
Johnson, Samuel	Landmark Fisheries
Kenchington, Ellen	Fisheries and Oceans Canada
Kumar, Rajeev	Fisheries and Oceans Canada
Le Corre, Nicolas	Fisheries and Oceans Canada
Malayny, Chelsea	Fisheries and Oceans Canada
Munro, Hannah	Fisheries and Oceans Canada
Murillo Perez, Javier	Fisheries and Oceans Canada
Thompson, Susan	Fisheries and Oceans Canada
Varkey, Divya	Fisheries and Oceans Canada
Walkusz, Wojciech	Fisheries and Oceans Canada
Yashayaev, Igor	Fisheries and Oceans Canada

DENMARK (IN RESPECT OF FAROE ISLANDS + GREENLAND)	
In-person	
Christiansen, Henrik	Greenland Institute of Natural Resources
Nygaard, Rasmus	Greenland Institute of Natural Resources
Virtual	
Buch, Tanja	Greenland Institute of Natural Resources
Burmeister, AnnDorte	Greenland Institute of Natural Resources
Petersen, Inuk	Greenland Institute of Natural Resources
Ridao Cruz, Luis	Faroe Marine Research Institute
EUROPEAN UNION	
In-person	
Garrido Fernández, Irene	Instituto Español de Oceanografía
Gonçalves, Patrícia	Instituto Portugues do Mar e da Atmosfera
Leocadio, Ana	DG Mare
Sacau Cuadrado, Mar	Instituto Español de Oceanografía
Virtual	
Durán Muñoz, Pablo	Instituto Español de Oceanografía
Domínguez-Petit, Rosario	Instituto Español de Oceanografía
González-Costas, Fernando	Instituto Español de Oceanografía
Näks, Liivika	Estonian Marine Institute, University of Tartu.
JAPAN	
In-person	
Butterworth, Doug S.	University of Cape Town
Virtual	
Brandao, Anabela	University of Cape Town
Rademeyer, Rebecca	University of Cape Town
Taki, Kenji	National Research Institute of Far Seas Fisheries
NORWAY	
Virtual	
Hallfredsson, Elvar	Institute of Marine Research
RUSSIAN FEDERATION	
In-person	
Fomin, Konstantin	Polar Research Institute of Marine Fisheries and Oceanography
Virtual	
Melnikov, Sergey	Russian Federal Research Institute of Fisheries and Oceanography
Pochtar, Maria	Polar Research Institute of Marine Fisheries and Oceanography

Tairov, Temur	Representative of the Federal Agency for Fisheries of the Russian Federation in Canada
UKRAINE	
Virtual	
Paramonov, Valeriy	Institute of Fisheries, Marine Ecology and Oceanography
UNITED KINGDOM	
In-person	
De Oliveira, José	Centre for Environment, Fisheries and Aquaculture Science
Kenny, Andrew	Centre for Environment, Fisheries and Aquaculture Science
UNITED STATES OF AMERICA	
Virtual	
Lipsky. Andy	National Oceanic and Atmospheric Administration
INVITED EXPERTS	
Virtual	
Berg, Casper	DTU Aqua – National Institute of Aquatic Resources
FOOD AND AGRICULTURE ORGANIZATION (FAO)	
Vitual	
Thompson, Anthony	Consultant, Food and Agriculture Organization of the United Nations
OBSERVERS	
In-person	
Bourgeois, Vanessa	Atlantic Groundfish Council
Devine, Brynn	Oceans North
Fuller, Susanna	Oceans North
Rayner, Gemma	Oceans North
Schleit, Katie	Oceans North
Virtual	
Luckhurst, Brian	Sargasso Sea Commission
NAFO SECRETARIAT	
Aker, Jana	Fisheries Management Coordinator
Bell MacCallum, Dayna	Senior Scientific Information Administrator
Benediktsdóttir, Brynhildur	Executive Secretary
Goodick, Stanley	Deputy Executive Secretary and Senior Finance and Staff Administrator
Guile, Sarah	Senior Office Administrator
Kendall, Matt	Senior IT Manager
Pacey, Alexis	Senior Publications/Web Manager
Perreault, Andrea	Senior Science Coordinator