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**Recommended Citation:**

NAFO. 2023. Report of the Scientific Council, 18 - 22 September 2023, Vigo, Spain. NAFO SCS Doc. 23/22.

**REPORT OF SCIENTIFIC COUNCIL MEETING**  
**18-22 September 2023**

Chair: Karen Dwyer

Rapporteur: Tom Blasdale

**I. PLENARY SESSIONS**

The Scientific Council (SC) and its Standing Committees met at the Palacio de Congresos Mar de Vigo, Vigo, Spain, with additional participants joining the meeting by Webex, from 18 to 22 September 2023 to consider the various matters in its agenda. Representatives attended from Canada, Denmark (in respect of the Faroes and Greenland), the European Union, Japan, Norway, the Russian Federation, the United Kingdom and the United States of America. The Executive Secretary, Scientific Council Coordinator and other members of the Secretariat were in attendance. Observers attended from FAO and the Deep-Sea Conservation Coalition.

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

The Council was called to order at 10:00 on 18 September 2023. The provisional agenda was **adopted** and the Scientific Council Coordinator was appointed the rapporteur.

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

The Agenda, List of Summary (SCS) Documents, and List of Representatives, Advisers and Experts, are given in Appendices III-V.

The final session was called to order at 09:00 on 22 September 2023. The Council considered and adopted the reports of the STACREC and STACFIS Standing Committees and agreed that the report of this meeting would be finalized by correspondence. The meeting was adjourned at 10:30 on 22 September 2023.

**II. REVIEW OF SCIENTIFIC COUNCIL RECOMMENDATIONS**

There were no Scientific Council recommendation requiring immediate attention at this meeting. A detailed review of recommendations was deferred to the June 2024 meeting.

**III. JOINT SESSION OF COMMISSION AND SCIENTIFIC COUNCIL**

The Commission and Scientific Council met in joint sessions on 19 September to discuss the 2018 NAFO performance review, the Scientific Council's response to requests for advice from the Commission, the reports of the joint SC/Commission Working Groups and other matters of common interest.

**1. Presentation of Scientific Advice by the Chair of the Scientific Council**

**a) Response of the Scientific Council to the Commission's request for scientific advice**

The Chair of the Scientific Council, Karen Dwyer (Canada), presented the work of the Scientific Council in 2022/2023, including the responses to the Commission requests for scientific advice on fish stocks and on other topics, outlined in detail in SCS Doc. 23/18. Contracting Parties expressed their appreciation for the work of the Scientific Council and thanked the Scientific Council Chair for the presentation and for her leadership of the Scientific Council for the past two years.

**b) Feedback to the Scientific Council regarding the advice and its work during this meeting**

The Commission provided written submissions for requests to the Scientific Council for additional information. One question related to a request for additional analyses for 3LNO yellowtail in COM WP 23-27 and two questions were received for additional analyses for 3M cod in COM WP 23-28 and COM WP 23-29.

Scientific Council responses were forwarded to the Commission and are included as section IV. 2.a-c of this report.

**c) Other issues as determined by the Chairs of the Commission and the Scientific Council**

The Chairs of the Commission and the Scientific Council noted that there would be further discussion relating to the Scientific Council workload under Agenda item III.2.e, Informal Group to reflect on the workload of the Scientific Council, April 2023.

**2. Presentation of the reports and recommendations of the joint Commission–Scientific Council Working Groups**

**a) Joint Commission–Scientific Council Working Group on Improving Efficiency of NAFO Working Group Process (E-WG), 2023**

The acting Commission Chair presented the report of the E-WG meeting in 2023 (COM-SC Doc. 23-01). The E-WG proposed that for 2024, the following two-week periods, be considered for NAFO intersessional meetings:

- 26 February – 08 March 2024;
- 15 – 26 April 2024; and
- 12 – 23 August 2024

The Commission adopted these proposed meeting windows for 2024.

**b) Joint Commission–Scientific Council Working Group on Risk-based Management Strategies (WG-RBMS), April and July 2023**

The co-Chairs, Fernando González-Costas (European Union) and Ray Walsh (Canada) presented the reports and recommendations from the April and July 2023 WG-RBMS meetings (COM-SC Doc. 23-02 and COM-SC Doc. 23-03). The co-Chairs highlighted the work on the management strategy evaluation (MSE) processes for 2+3KLMNO Greenland halibut and 3LN redfish, provisional draft Precautionary Approach (PA) framework, and reflected on the updated workplans of the working group for the MSE processes and the PA Framework revision. The co-Chairs thanked meeting participants for their collaboration through the year, as well as the invited experts that facilitated the work of the PA framework review.

The Commission and Scientific Council thanked the co-Chairs for the presentation and the working group for all the ongoing work that is being completed. It was also noted that, pending the progress with the other MSE processes, there is a preference of some Contracting Parties that 3LNO yellowtail flounder and 3NO witch flounder should be the next stocks for MSE development.

**c) Joint Commission–Scientific Council Working Group on Ecosystems Approach Framework to Fisheries Management (WG-EAFFM), August 2022**

The co-Chairs, Mar Sacau Cuadrado (European Union) and Elizabethann Mencher (United States of America) presented the report and recommendations from the July 2023 WG-EAFFM meeting (COM-SC Doc. 23-04). The co-Chairs highlighted the recommendation to maintain vulnerable marine ecosystem (VME) closed areas 7a, 11a, 14a and 14b and resulting changes to the NAFO Conservation and Enforcement Measures (CEM), the requests for the Scientific Council to continue their work on the Ecosystem Roadmap, the recommendation to put forward the seamount closure areas and the sponge VME fishery closures 1 to 6 for inclusion in the World Database on Other Effective Area-based Conservation Measures (OECMs), and the recommendation for Contracting Parties to minimize the impacts of trawl surveys in NAFO VME areas.

The Commission and Scientific Council thanked the co-Chairs for the presentation and the working group for all the ongoing work being completed. During the presentation of the report, the co-Chairs noted that the WG-EAFFM, recognizing the workload issues with the Scientific Council, did not reach consensus on including a request to the Scientific Council to provide advice on the potential impact of activities other than fishing in the Convention Area for next year.

**d) Joint Commission–Scientific Council Catch Estimation Strategy Advisory Group (CESAG), April 2022**

The co-Chair of CESAG, Katherine Sosebee (United States of America) presented an update on the status of the work of CESAG in 2023. CESAG completed its work via correspondence for 2023, and the final estimates for the 2022 catch (COM-SC CESAG-WP 23-01 (Rev. 2)) were circulated to the Scientific Council by the 01 May deadline, following the procedure outlined in the Terms of Reference (COM-SC Doc. 17-09). In 2024, it is

intended that the review of the 2023 catch estimates will be made by correspondence unless new issues (e.g., revision of the Catch Estimation Strategy) emerge that would warrant a virtual meeting.

#### **e) Informal Group to reflect on the workload of the Scientific Council, April 2023**

The Scientific Council Chair and acting Commission Chair presented the report from the NAFO Informal Group to Reflect on the Workload of the Scientific Council (COM-SC WP 23-01). The Chairs discussed some of the options that were tabled during that meeting for way to alleviate the workload of the Scientific Council. The Commission agreed that some action is required in order to alleviate the Scientific Council workload and requested STACFAD to review financial implications of some of these options.

### **3. Formulation of Requests to the Scientific Council for Scientific Advice on the Management in 2024 and Beyond of Certain Stocks in Subareas 2, 3, 4, 6 and Other Matters**

In accordance with the procedure outlined in FC Doc. 12-26, a steering committee was formed to assist in the drafting of the Commission Request. The committee consisted of the Scientific Council Coordinator and representatives from Canada and European Union. The first draft of the requests was presented to the Commission in COM WP 23-41, which was updated and circulated to the Scientific Council for comments in COM WP 23-41 (Revised). The Commission reviewed the input from the Scientific Council, reflected on some of the discussions under other agenda items, and formulated the final requests in COM WP 23-41 (Rev. 3).

## **IV. RESEARCH COORDINATION**

The Council adopted the Report of the Standing Committee on Research Coordination (STACREC) as presented by the Chair, Diana González-Troncoso. The full report of STACREC is in Appendix I.

## **V. FISHERIES SCIENCE**

The Council adopted the Report of the Standing Committee on Fisheries Science (STACFIS) as presented by the Chair, Mark Simpson. The full report of STACFIS is at Appendix II.

## **VI. REQUESTS FROM THE COMMISSION**

### **1. Requests deferred from the June Meeting**

#### **a) Presentation of any new results from stock assessments and the scientific advice of pelagic *Sebastes mentella* (ICES Divisions V, XII and XIV; NAFO 1) (Commission request #9 in SCS Doc. 23/01)**

**Commission request #9:** *The Commission requests that any new results from stock assessments and the scientific advice of Pelagic Sebastes mentella (ICES Divisions V, XII and XIV; NAFO 1) to be presented to the Scientific Council, and request the Scientific Council to prepare a summary of these assessments to be included in its annual report.*

#### **Scientific Council Responded:**

No new stock assessment for Pelagic *Sebastes mentella* was done in 2023. Current advice from ICES is valid until 2024.

### **2. Requests Received from the Commission during the Annual Meeting**

#### **a) From Canada regarding 3M cod:**

*Noting the high variability in TAC advice on 3M cod in recent years, which we understand is due largely to highly variable biological parameters, and noting the lack of strong recruitment in this stock:*

*1. Is the expectation of growth in SSB to 2025, as outlined in the advice, also apparent in the total biomass from 2024 to 2026?*

*2. Based on existing projections, what 2024 TAC levels would be likely to sustain growth in both total biomass and SSB through the projection period from 2024 to 2026?*

**Scientific Council responded:**

Because the biological parameters of this stock are very variable across the years, even from one year to the next, two-years projections are likely to be inaccurate.

Projections to 2026 require additional assumptions:

- F (fishing mortality) in 2024 and 2025 will be the same
- recruitment at age 1 is estimated based on the average of the recruitments in 2019 -2021.
- Biological parameters are assumed to be constant in these projections.

*1. Is the expectation of growth in SSB to 2025, as outlined in the advice, also apparent in the total biomass from 2024 to 2026?*

The projections tables including the projected total biomass, SSB and the yield are given below. Given those results, the total biomass is projected to increase for levels of F below  $1/2F_{lim}$ .

*2. Based on existing projections, what 2024 TAC levels would be likely to sustain growth in both total biomass and SSB through the projection period from 2024 to 2026?*

Under the assumptions made above, and using as reference the 2023 assessment value, any F less or equal to  $F_{bar} = F_{2023}$  (median = 0.058) is projected to grow the stock through the 2024-2026 period with high uncertainty.

	B		SSB		Yield
Median and 80% CI					
$F_{bar} = F_{sq}$ (median = 0.053)					
2023	53812	(47944 - 61013)	27709	(24790 - 30794)	6100
2024	58438	(51161 - 68867)	30747	(27207 - 34601)	0
2025	65890	(56510 - 78568)	39660	(34924 - 44681)	0
2026	77315	(63756 - 94791)	52118	(45332 - 59308)	0
$F_{bar} = 0$					
2023	53812	(47944 - 61013)	27709	(24790 - 30794)	6100
2024	58438	(51161 - 68867)	30747	(27207 - 34601)	6509
2025	59324	(50003 - 72050)	33696	(29110 - 38825)	6788
2026	63225	(49978 - 80741)	39206	(32587 - 46263)	
$F_{bar} = F_{2023}$ (median = 0.058)					
2023	53812	(47944 - 61013)	27709	(24790 - 30794)	6100
2024	58438	(51161 - 68867)	30747	(27207 - 34601)	7079
2025	58752	(49433 - 71480)	33199	(28505 - 38167)	7294
2026	62098	(48886 - 79547)	38220	(31615 - 45378)	
$F_{bar} = 1/2F_{lim}$ (median = 0.078)					
2023	53812	(47944 - 61013)	27709	(24790 - 30794)	6100
2024	58438	(51161 - 68867)	30747	(27207 - 34601)	9176
2025	56673	(47350 - 69385)	31352	(26697 - 36365)	8932
2026	58207	(44956 - 75456)	34599	(28098 - 41635)	
$F_{bar} = 2/3F_{lim}$ (median = 0.104)					
2023	53812	(47944 - 61013)	27709	(24790 - 30794)	6100
2024	58438	(51161 - 68867)	30747	(27207 - 34601)	11708
2025	54177	(44843 - 66893)	29127	(24423 - 34096)	10609
2026	53777	(40713 - 70897)	30586	(24211 - 37687)	
$F_{bar} = 3/4F_{lim}$ (median = 0.117)					
2023	53812	(47944 - 61013)	27709	(24790 - 30794)	6100
2024	58438	(51161 - 68867)	30747	(27207 - 34601)	12903
2025	53003	(43651 - 65719)	28064	(23409 - 33003)	11310
2026	51812	(38786 - 68825)	28840	(22412 - 35859)	
$F_{bar} = F_{lim}$ (median = 0.157)					
2023	53812	(47944 - 61013)	27709	(24790 - 30794)	6100
2024	58438	(51161 - 68867)	30747	(27207 - 34601)	16163
2025	49790	(40459 - 62527)	25247	(20608 - 30117)	12892
2026	46682	(33789 - 63405)	24314	(17976 - 31362)	

**b) From Denmark (in respect of the Faroe Islands and Greenland) regarding 3M cod**

Regarding the 3M Cod assessment, DFG would like to ask the SC to provide a projection of an upper limit F scenario, where:

a)  $P(SSB < SSBlim)$  in 2024 and 2025  $\leq 10\%$

AND

b)  $P(F > Flim)$  in 2024  $\leq 10\%$

**Scientific Council responded:**

New projections with different levels of F were made in order to get the value that gives  $P(F > F_{lim}) = 10\%$  for 2024 while  $P(SSB < SSBlim) \leq 10\%$  in 2024 and 2025, corresponding to and  $F = 0.79 * F_{lim} = 0.124$ . The results of this projection are listed together with the results of the advice provided in June.

Under this F projection, total stock biomass and SSB in 2025 are expected to be below the 2023 level.





	B		SSB		Yield
Median and 80% CI					
$F_{bar} = 0$					
2023	53812	(47944 - 61013)	27709	(24790 - 30794)	6100
2024	58438	(51161 - 68867)	30747	(27207 - 34601)	0
2025	65890	(56510 - 78568)	39660	(34924 - 44681)	
$F_{bar} = F_{sq}$ (median = 0.053)					
2023	53812	(47944 - 61013)	27709	(24790 - 30794)	6100
2024	58438	(51161 - 68867)	30747	(27207 - 34601)	6509
2025	59324	(50003 - 72050)	33696	(29110 - 38825)	
$F_{bar} = F_{2023}$ (median = 0.058)					
2023	53812	(47944 - 61013)	27709	(24790 - 30794)	6100
2024	58438	(51161 - 68867)	30747	(27207 - 34601)	7079
2025	58752	(49433 - 71480)	33199	(28505 - 38167)	
$F_{bar} = 1/2F_{lim}$ (median = 0.078)					
2023	53812	(47944 - 61013)	27709	(24790 - 30794)	6100
2024	58438	(51161 - 68867)	30747	(27207 - 34601)	9176
2025	56673	(47350 - 69385)	31352	(26697 - 36365)	
$F_{bar} = 2/3F_{lim}$ (median = 0.104)					
2023	53812	(47944 - 61013)	27709	(24790 - 30794)	6100
2024	58438	(51161 - 68867)	30747	(27207 - 34601)	11708
2025	54177	(44843 - 66893)	29127	(24423 - 34096)	
$F_{bar} = 3/4F_{lim}$ (median = 0.117)					
2023	53812	(47944 - 61013)	27709	(24790 - 30794)	6100
2024	58438	(51161 - 68867)	30747	(27207 - 34601)	12903
2025	53003	(43651 - 65719)	28064	(23409 - 33003)	
$F_{bar} = 0.79F_{lim}$ (median = 0.124)					
2023	53812	(47944 - 61013)	27709	(24790 - 30794)	6100
2024	58438	(51161 - 68867)	30747	(27207 - 34601)	13448
2025	52466	(43102 - 65187)	27575	(22952 - 32475)	
$F_{bar} = F_{lim}$ (median = 0.157)					
2023	53812	(47944 - 61013)	27709	(24790 - 30794)	6100
2024	58438	(51161 - 68867)	30747	(27207 - 34601)	16163
2025	49790	(40459 - 62527)	25247	(20608 - 30117)	

	Yield		P(SSB < SSBlim)			P(F > Flim)		P(SSB <sub>25</sub> > SSB <sub>23</sub> )
	2023	2024	2023	2024	2025	2023	2024	
F=0	6100	0	<1%	<1%	<1%	<1%	<1%	100%
Fsq = 0.053	6100	6509	<1%	<1%	<1%	<1%	<1%	100%
F2023 = 0.058	6100	7079	<1%	<1%	<1%	<1%	<1%	100%
1/2Flim = 0.078	6100	9176	<1%	<1%	<1%	<1%	<1%	94%
2/3Flim = 0.104	6100	11708	<1%	<1%	<1%	<1%	<1%	72%
3/4Flim = 0.117	6100	12903	<1%	<1%	<1%	<1%	2%	52%
<b>0.79Flim = 0.124</b>	<b>6100</b>	<b>13448</b>	<b>&lt;1%</b>	<b>&lt;1%</b>	<b>&lt;1%</b>	<b>&lt;1%</b>	<b>10%</b>	<b>44%</b>
Flim = 0.157	6100	16163	<1%	<1%	<1%	<1%	50%	14%

**c) From Canada regarding Yellowtail Founder**

*For 3LNO Yellowtail flounder, the advice in the grey box is based on projections that assume a full TAC utilization in 2023. As the primary quota holder, Canada can confirm that this will not be the case. In order to inform the Commission's decision making, Canada requests that SC provide additional projection tables with assumed 2023 catch levels of 1) 8,100t and 2) 10,500t.*

**Scientific Council responded:**

Medium-term projections were carried forward to the year 2026 under two catch scenarios for 2023 (Catch<sub>2023</sub>= 8,100 t and Catch<sub>2023</sub>= 10,500 t). Constant fishing mortality was applied from 2024-2026 at several levels of  $F$  ( $F=0$ ,  $F_{status\ quo}=0.107$ , 75%  $F_{MSY}$ , 85%  $F_{MSY}$ , and  $F_{MSY}=0.201$ ) for both scenarios. Projected yield for 2024 and 2025 and projected relative biomass ( $B/B_{msy}$ ) for 2024 to 2026 are shown in Table 1 for both catch scenarios. Risk tables for the two catch scenarios are given in Table 2.

**Table 1.** Two scenarios (Catch<sub>2023</sub>= 8,100 t and Catch<sub>2023</sub>= 10,500 t) for medium-term projections for yellowtail flounder. Median and 80% confidence limits around relative biomass  $B/B_{msy}$  are shown, for projected F values of  $F=0$ ,  $F_{status\ quo}$ , 75%  $F_{msy}$ , 85%  $F_{msy}$  and  $F_{msy}$ .

Projections with Catch <sub>2023</sub> = 8 100 t				Projections with Catch <sub>2023</sub> = 10 500 t			
Year	Yield ('000t)		Projected relative Biomass( $B/B_{msy}$ )	Year	Yield ('000t)		Projected relative Biomass( $B/B_{msy}$ )
	median		median (80% CL)		median		median (80% CL)
$F=0$				$F=0$			
2024	0.00		1.26 ( 0.73, 1.77)	2024	0.00		1.24 ( 0.71, 1.74)
2025	0.00		1.44 ( 0.85, 1.96)	2025	0.00		1.42 ( 0.83, 1.94)
2026			1.59 ( 0.97, 2.11)	2026			1.57 ( 0.95, 2.09)
$F_{status\ quo} = 0.107$				$F_{status\ quo} = 0.107$			
2024	12.09		1.26 ( 0.73, 1.77)	2024	11.83		1.24 ( 0.71, 1.74)
2025	12.40		1.31 ( 0.74, 1.81)	2025	12.20		1.29 ( 0.72, 1.79)
2026			1.34 ( 0.75, 1.84)	2026			1.32 ( 0.73, 1.82)
75% $F_{MSY}=0.151$				75% $F_{MSY}=0.151$			
2024	17.38		1.26 ( 0.73, 1.77)	2024	17.02		1.24 ( 0.71, 1.74)
2025	17.18		1.25 ( 0.69, 1.74)	2025	16.91		1.23 ( 0.67, 1.72)
2026			1.24 ( 0.65, 1.73)	2026			1.22 ( 0.63, 1.72)
85% $F_{MSY}=0.173$				85% $F_{MSY}=0.173$			
2024	19.7		1.26 ( 0.73, 1.77)	2024	19.29		1.24 ( 0.71, 1.74)
2025	19.07		1.22 ( 0.67, 1.71)	2025	18.77		1.2 ( 0.65, 1.69)
2026			1.19 ( 0.61, 1.68)	2026			1.18 ( 0.59, 1.67)
$F_{MSY}=0.202$				$F_{MSY}=0.202$			
2024	23.17		1.26 ( 0.73, 1.77)	2024	22.69		1.24 ( 0.71, 1.74)
2025	21.73		1.18 ( 0.64, 1.67)	2025	21.40		1.16 ( 0.62, 1.65)
2026			1.13 ( 0.55, 1.62)	2026			1.12 ( 0.53, 1.61)

**Table 2.** Yield (000 t) and risk (%) of  $B_y < B_{msy}$  and  $F_y > F_{msy}$  ( $F_{lim} = F_{msy}$ ) at projected F values of  $F_0$ ,  $F_{status\ quo}$ , 75%  $F_{msy}$ , 85%  $F_{msy}$  and  $F_{msy}$  for two catch scenarios in 2023: Catch<sub>2023</sub>= 8,100 t and Catch<sub>2023</sub>= 10,500 t.

Catch <sub>2023</sub> =8 100 t	Yield ('000t)		P(B<B <sub>lim</sub> )			P(B<B <sub>MSY</sub> )			P(F>F <sub>lim</sub> )			P(B <sub>2026</sub> <B <sub>2023</sub> )
	2024	2025	2024	2025	2026	2024	2025	2026	2024	2025	2026	
$F=0$	0.0	0.0	1%	1%	<1%	26%	16%	11%	<1%	<1%	<1%	17%
$F_{status\ quo} = 0.107$	12.1	12.4	1%	1%	1%	26%	23%	22%	9%	10%	10%	36%
75% $F_{MSY} = 0.151$	17.4	17.2	1%	1%	2%	26%	28%	29%	25%	25%	26%	45%
85% $F_{MSY} = 0.173$	19.7	19.1	1%	2%	3%	26%	29%	32%	34%	34%	35%	49%
$F_{MSY}=0.202$	23.2	21.7	1%	2%	4%	26%	32%	38%	50%	50%	50%	55%



Catch <sub>2023</sub> = 10 500t	Yield ('000t)		P(B<B <sub>lim</sub> )			P(B<B <sub>MSY</sub> )			P(F>F <sub>lim</sub> )			P(B <sub>2026</sub> <B <sub>2023</sub> )
	2024	2025	2024	2025	2026	2024	2025	2026	2024	2025	2026	
$F=0$	0.0	0.0	1%	1%	<1%	28%	17%	12%	<1%	<1%	<1%	19%
$F_{status\ quo} = 0.107$	11.8	12.2	1%	1%	2%	28%	25%	23%	10%	10%	10%	37%
75% $F_{MSY} = 0.151$	17.0	16.9	1%	2%	3%	28%	29%	30%	25%	26%	26%	46%
85% $F_{MSY} = 0.173$	19.3	18.8	1%	2%	3%	28%	31%	34%	34%	35%	35%	50%
$F_{MSY}=0.202$	22.7	21.4	1%	2%	4%	28%	34%	39%	50%	50%	50%	56%

**3. Further progress on items related to COM requests (in SCS Doc. 23/01)**

**a) 3-5 year work plan (Commission request #8 in SCS Doc. 23/01)**

**i) Longer term work items**

Within the wider topic of work-planning and Scientific Council workload, Scientific Council discussed the approach to be taken on a number of longer-term work items. There are a number of SC work items which will take up time in coming years that either are not directly related to a specific Commission request, or relate to ongoing work that will feed into SC responses to periodically recurring Commission requests (e.g., assessment of bottom fishing impacts) in future years.

The following such items were identified:

- Update on Canadian comparative fishing analysis
- Climate change (see below)
- 2025 (tentative) Benchmark for 3LNO American plaice and 3NO cod (Possibly also 3M American plaice).
- Future MSEs: following the benchmark, it is anticipated that SC will be requested to carry out management strategy evaluations for 3NO witch flounder and 3LNO yellowtail flounder. SC does not necessarily consider that these are the most suitable stocks for benchmark or that it will be feasible to carry out two MSE processes simultaneously.
- FAO/NAFO ecosystem approach symposium (section VI, 1.b below).
- Re-assessment of vme closures (2026)
- Ecosystem summary sheet (ESS) update (5 year schedule: next in 2028)
- Re-assessment of bottom fishing impacts (SAI) (5 year schedule: next in 2026)
- Update of Ecosystem Production Potential model input (as soon as possible)
- WG-ESA work on data repository and standardized layers.

**b) Climate change work.**

SC noted that this year’s request from the Commission for information regarding the current and future impacts of climate change on NAFO-managed stocks, non-target species and associated ecosystems (request #10 in COM doc. 23-09) is part of a wider Commission proposal to address the effects of climate change (COM Working Paper 23-33 (Rev.)) and as such, it is expected that SC work on climate change issues will be ongoing for number of years.

Tony Thompson (FAO) informed SC that, as part of the FAO deep-sea fisheries ABNJ project, FAO would be able to provide funding for a consultant to address terms of reference proposed by SC in the context of a wider climate change study which will involve several RFMOs. SC thanked Tony for this offer and proposed setting up a steering group to develop terms of reference for the consultant, and a working group to consider the first steps in taking this work forward in SC. Suggested members of this working group are: the SC chair (Diana González), chairs of STACFEN and WG-ESA (Miguel Caetano and Mar Sacau), Mariano Koen-Alonso, Lisa Readdy (or Andy Kenny), Irene Garrido, Mark Simpson, Lisa Hendrickson, Laura Wheeland, and Fred Cyr, as well as any new people CPs are able to provide to work on this topic. The steering group, composed by Diana, Miguel and Mariano, will work with Tony on setting up the contract.

The steering group will meet prior to WG-ESA 2023 to develop terms of reference for the consultant.



SC noted that additional resources will be required from contracting parties to complete this work, and that although this is acknowledged in COM Working Paper 23-33, it is not reflected in the Commission request.

**c) Continued work on the PA Review (Commission request #7 in SCS Doc. 23/01)**

The co-Chair of Precautionary Approach Working Group (PA-WG), Fernando González, updated Scientific Council on decisions taken at WG-RBMS in July 2023 and agreed work plan going forward (COM-SC Doc. 23-03). The next step in the workplan will be the review progress on simulation testing and provision of feedback by WG-RBMS in April 2024. Testing will then be completed by Scientific Council at the June 2024 meeting. At its August 2024 meeting, WG-RBMS will review the results of the simulation testing and recommend revised a PA Framework to Commission.

In July, WG-RBMS discussed the different approaches to be taken to testing. Two alternatives were considered: general, based on generic life history models, and specific, based on case studies on actual stocks. Scientific Council agreed to go ahead with the general testing with the possibility of adding case studies for specific stocks. PA-WG and the development team will work by correspondence to discuss life history parameters to be tested.

Following the discussion in the commission arising from the COM-SC joint session, STACFAD has agreed to reallocation of funds from the internship program to scientific purposes, if required. SC agreed that these funds should be used to hire a consultant to assist with the simulation testing work.

SC expressed its deepest thanks to the invited experts for their considerable input throughout the process, going well beyond the agreed time frame, and presented all three experts with certificates of appreciation. The two experts present in the meeting, Daniel Howell and Steve Cadrin, expressed a desire to remain involved in the project and see it through to the end.

## VII. REVIEW OF FUTURE MEETING ARRANGEMENTS

For in-person meetings, facilities for virtual participation will be available, but people participating should be present in person where possible. Designated Experts and core contributors to SC and all its standing committees are expected to attend in person.

### 1. WG-ESA, 14- 23 November 2023

The Working Group on Ecosystem Science and Assessment will meet at the NAFO Secretariat, Halifax, Nova Scotia, Canada, 14- 23 November 2023.

### 2. Scientific Council, January 2024

Three-day virtual meeting to discuss MSE and PA work.

### 3. STACREC survey presentation, May 2024

One day virtual meeting.

### 4. Scientific Council, June 2024

The Scientific Council June meeting will be held in Halifax, Nova Scotia, 31 May -13 June 2024.

### 5. Scientific Council (in conjunction with NIPAG), 2024

Dates and location to be determined.

### 6. Scientific Council, September 2024

Scientific Council noted that the Annual Meeting will be held in September in Halifax, Nova Scotia, unless an invitation to host the meeting is extended by a Contracting Party.

### 7. NAFO/ICES Joint Groups

#### a) NIPAG, 2024

Dates and location to be determined.

**b) ICES – NAFO Working Group on Deep-water Ecosystem .**

January 2024.

**c) WG-HARP**

Dates and location to be determined.

**8. Commission- Scientific Council Joint Working Groups****a) WG-EAFFM**

The joint Commission- Scientific Council Working Group on the Ecosystem approach to Fisheries Management (WG-EAFFM), August 2024, location to be decided

**b) WG-RBMS**

The joint Commission- Scientific Council Working Group on Risk Based Management Systems (WG-RBMS) April and August 2024, locations to be decided

**c) CESAG**

The next meeting of the Catch Estimation Strategy Advisory Group (CESAG) will be in by correspondence(virtual meeting if required) before May 1, 2024.

**VIII. FUTURE SPECIAL SESSIONS****1. Discussion of proposed topics****a) International Fisheries Section flatfish symposium 2024**

Scientific Council noted that the International Fisheries Section (IFS) flatfish symposium, originally planned for 2020, has been postponed to 2024 and will take place in Europe. NAFO is a sponsor of this event, and a member of SC will be sponsored to attend.

**b) FAO Deep Seas Fisheries Project EAFM Symposium**

Tony Thompson presented the outline of a proposal to hold a three-day symposium in early 2025 under the auspices of the FAO Deep-sea Fisheries (DSF) Project on the “Implementation of the Ecosystem Approach to Fisheries Management”. He noted that other deep-sea RFMOs were approached, and many felt that a more general approach to the implementation of EAFM would be appreciated. It is therefore suggested that the symposium include aspects relating to the importance of retained species, discarded species and ecosystems to EAFM. Further it was felt that the first day would focus on science, the second day moving towards management considerations, and the final day being interactive to discuss implementation under different scenarios. The DSF Project would also work with RFMOs to develop more generic EAFM frameworks in the 18 months prior to the symposium and this would feed into the final day of the meeting.

The majority of the organization and principal financial support of the symposium would be provided by the DSF Project, FAO.

Scientific Council supported NAFO becoming an organizing partner and noted the following:

Agreement to approach ICES to join as an additional organising partner (November 2023)

- Nominations for the organising committee (Mariano Koen-Alonso, Andy Kenny, Miguel Caetano, Rick Rideout, Tom Blasdale). Eszter Hidas and Tony Thompson would represent the DSF Project.
- Keynote speakers identified and concept note circulated (by end 2023)
- Publication in the NAFO *Journal of Northwest Atlantic Fishery Science* (and DSF Project to provide financial support for an editor)

Contribution of USD 10,000 from from NAFO to support costs (for STACFAD, September 2024)

The venue was discussed, and Rome, Italy, was suggested. Other suggestions are welcome.

## IX. OTHER MATTERS

### 1. Meeting Reports

#### a) ICES/NAFO Working Group on Deep-water Ecology (WG-DEC)

This meeting was attended by Ellen Kenchington (Canada). The presentation of the meeting report was deferred to June 2023.

#### b) ICES/NAFO/NAMMCO Working Group on Harp and Hooded Seals (WG-HARP)

No NAFO scientist attended this meeting due to the retirement of Garry Stenson. SC will consider a replacement in June 2023.

#### c) Presentation of NAFO Scientific Merit Award to Karen Dwyer

NAFO Scientific Council (SC) was pleased to present a merit award to Karen Dwyer (Canada) to acknowledge and celebrate the extensive contributions that Karen has made to SC. Karen has served the SC in numerous capacities, starting as the Designated Expert (DE) for American Plaice in NAFO Divs. 3LNO. Karen provided exceptional leadership to SC during her tenure as chair of the SC subcommittees STACREC and STACFIS, and as chair of the Scientific Council. As SC chair Karen was instrumental in initiating the review of NAFO's Precautionary approach, and presided over NAFO adoption of its first ecosystem reference point, a milestone step in the implementation of the ecosystem approach. Karen's capacity to find the balanced path in the midst of sometimes passionate arguments, together with her special sense of humor to put things in perspective, has helped SC to find a way through in numerous occasions, and SC has been better for it. SC wishes Karen all the best in her future roles, and hopes that many of them would still involve SC, because otherwise SC will miss her too much.



Diana González-Troncoso (left) presents Scientific Council Chair, Karen Dwyer (right), with the Scientific Council Merit Award.

#### d) Any other business

##### i) *FAO ABNJ Deep Sea Fisheries (DSF) Project*

Tony Thompson (FAO) gave an update on the FAO ABNJ Deep Sea Fisheries (DSF) Project. Of particular significance to Scientific Council is the Ecosystem Approach workshop planned for 2025 (see section VIII,1.b)

##### ii) *Communication between SC and Joint Working Groups.*

Scientific Council noted that the current practice of requiring all work presented to the joint Com/SC working groups (WG-ESA and WG-EAFFM) to be reviewed by the council prior to presentation puts an unnecessary burden on SC members. To remedy this situation Scientific council agreed the following:

Scientific Council aims to peer-review scientific work prior to presentation at joint working groups. However, in cases where peer-review cannot be done in time for presentation at a joint Working Group, SC agreed that, with the previous approval of SC or the executive committee, work produced by SC members can be presented directly to the joint working.

When work is presented in this way, it will be made clear that this is not formal SC advice and that it has not been reviewed by SC.

## **X. ADOPTION OF REPORTS**

### **1. Committee Reports of STACFIS and STACREC**

The report of STACREC was adopted on 18 September 2023 subject to editorial revision following this meeting.

### **2. Report of Scientific Council**

The SC report was adopted on 22 September 2023 subject to editorial revision following this meeting.

## **XI. ADJOURNMENT**

The meeting was adjourned at 16:00 on 22 September 2023.



## APPENDIX I. REPORT OF STANDING COMMITTEE ON RESEARCH COORDINATION (STACREC)

Chair: Diana González-Troncoso

Rapporteur: Tom Blasdale

### 1. Opening

STACREC met at the Palacio de Congresos Mar de Vigo, Vigo, Spain, with additional participants joining the meeting by Webex, on 18 September 2023. The meeting opened at 11:00. Representatives attended from Canada, Denmark (in respect of the Faroes and Greenland), the European Union, Japan, Norway, the Russian Federation, the United Kingdom and the United States of America. The Scientific Council Coordinator and other members of the Secretariat were in attendance. Observers attended from FAO and the Deep-Sea Conservation Coalition.

### 2. Appointment of Rapporteur

The Scientific Council Coordinator, Tom Blasdale, was appointed as rapporteur.

### 3. Fisheries Statistics

#### a) Progress Reports on Secretariat Activities

There were no new items to report at this meeting.

#### b) Review of STATLANT21 Data

The following table updates the situation with the submission of STATLANT.

**Table 1.** Dates of receipt of STATLANT 21A reports for 2010-2022 and 21B reports for 2010-2022 received prior to 03 June 2023.

Country/component	STATLANT 21A (deadline, 1 May)			STATLANT 21B (deadline, 31 August)		
	2020	2021	2022	2020	2021	2022
CAN-CA	14 Jul 22	14 Jul 22				
CAN-SF	30 Apr 21	6 Jun 22	24 Apr 23			
CAN-G	5 May 21	27 May 22	26 Apr 23		6 Sep 22	28 Aug 23
CAN-NL	30 Apr 21	26 May 22	28 Apr 23	31 Aug 21		31 Aug 21
CAN-Q						
CUB						
E/BUL						
E/EST	30 Apr 21	28 Apr 22	21 Apr 23	23 Aug 21	26 Aug 22	
E/DNK	27 May 21	30 Mar 22	9 Jun 23	21 Jul 21	15 Aug 22	
E/FRA						
E/DEU	30 Apr 21	7 Apr 22	9 Jun 23	30 Aug 21	25 Aug 22	
E/LVA	26 Apr 21	21 Apr 22	5 Apr 23			
E/LTU		31 May 22	9 Jun 23	3 Jul 21		
EU/POL		24 Jun 22				
E/PRT	26 Apr 21	19 Apr 22		28 Aug 21	30 Sep 22	
E/ESP	31 May 21	14 Jun 22	9 Jun 23	7 Jun 21	15 Jun 22	
GBR						
FRO	12 Jan 21	6 Apr 22	5 Jun 23	12 Jan 21	6 Apr 22	5 Jun 23
GRL	3 May 21	6 May 22	1 May 23	30 Aug 21	25 Aug 22	22 Aug 23
ISL						

JPN	28 Apr 21	27 Apr 22	28 Apr 23	24 Aug 21	30 Aug 22	30 Aug 23
KOR						
NOR	10 May 21	22 Apr 22	9 Jun 23	1 Sep 21	2 Sep 22	
RUS	30 Apr 21	27 Apr 22	28 Apr 23	30 Aug 21	25 Aug 22	31 Aug 23
USA	4 Mar 22	25 May 22	31 May 23			
FRA-SP	21 Jun 21	26 Apr 22	27 Apr 23		25 Aug 22	8 Aug 23
UKR						

The Scientific Council Coordinator reported that STATLANT 21B data submissions were very incomplete in 2023 and STATLANT 21A data remain incomplete. This was largely due to confidentiality issues affecting submission from certain EU member states, which are expected to be resolved very soon.

SC noted that CESAG data are used for the majority of stock assessments in recent years, however STATLANT data are still used in the computation of total catches for Total Catch Index (TCI) calculations. CESAG data are presently unsuitable for this purpose because data provided Canada for EEZ fisheries do not include all species. Mark Simpson will work with the Canadian administration to ensure that all species are included in future submissions.

#### 4. Research Activities

##### a) Surveys Planned for 2024 and 2025

SCS documents 23/23 and 23/24 will be finalized by the Secretariat.

#### 5. Other Matters

##### a) Review of SCR and SCS Documents

No new documents were presented at this meeting.

##### b) Other Business

###### *i) Data availability (open access, Share Point access, etc.) and format (submission of data, NAFodown)*

Scientific Council discussed submission of data to Designated Experts (DEs) by national representatives: National representatives are encouraged to submit aggregated total catch length distribution to DEs. They are also required to submit the disaggregated data, but the national representatives have better knowledge of how to aggregate the data. It was noted by the EU and Canada that observer length sampling on haul by haul covered by confidentiality requirements and would therefore have to be submitted in aggregated form.

SC noted that it is important to have the submitted data as well as assessment code stored by the Secretariat to ensure continuity if the DE is not available for any reason. SC will continue to work to develop a common format data to be used for storage noting synergies with the work currently being done by WG-EAS to develop a data repository.

###### *ii) Data gathering activities conducted by Faroes*

No update was received from the Faroes on activities in 2023, and so SC will continue to consider this not to be a valid survey. In June 2023, STACREC recommended that a scientist from DFO Maritimes region should be invited to present details of the design of the Canadian Atlantic halibut longline survey. Mark Simpson (Canada) reported that this will be presented during the next June SC meeting.

Noting that Scientific Council has little experience in planning longline surveys, the following were suggested as things that should be considered in order for this to be considered a valid survey:

- reduced total number of hooks set,
- inclusion of scientists on board,
- consistent stratification and allocation of effort to strata,
- a minimum of more than one station per stratum,
- consistent vessel,
- collecting full data from fish caught (length, sex, maturity etc.),
- collect benthos data,

## **6. Adjournment**

The STACREC meeting closed on 18<sup>th</sup> September at 12:15.

## APPENDIX II. REPORT OF STANDING COMMITTEE ON FISHERIES SCIENCE (STACFIS)

Chair: Mark Simpson

Rapporteur: Tom Blasdale

### I. OPENING

The Committee met at the Palacio de Congresos Mar de Vigo, Vigo, Spain, with additional participants joining the meeting by Webex, from 18 to 22 September 2023 to consider the various matters in its agenda. Representatives attended from Canada, Denmark (in respect of the Faroes and Greenland), the European Union, Japan, Norway, the Russian Federation, the United Kingdom and the United States of America. The Executive Secretary, Scientific Council Coordinator and other members of the Secretariat were in attendance. Observers attended from FAO and the Deep-Sea Conservation Coalition. The Scientific Council Coordinator and other members of the Secretariat were in attendance. The Chair, Mark Simpson (Canada) 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 with minor changes.

### II. ASSESSMENTS DEFERRED FROM THE JUNE 2022 MEETING.

#### 1. Northern Shortfin Squid (*Illex illecebrosus*) in Subareas 3+4

Interim Monitoring Report

(SCR Doc. 98/59, 75; 6/45; 16/21, 34REV; 19/ 42; 20/02, 10REV, 11; 23/02, 03; SCS Doc. 21/05, 06, 16)

##### a) Introduction

*Illex illecebrosus*, Northern shortfin squid, is semelparous with a lifespan of less than one year. Spawning occurs year-round with two peaks that result in two intra-annual cohorts. The species is considered a single stock throughout its range of exploitation, primarily in NAFO Subareas 3-6.

The Northern Stock Component was last assessed in 2022. The assessment is data-poor and neither in-season assessments nor annual biomass projections are currently possible for this sub-annual species. Relative biomass and mean body weight indices from the July Div. 4VWX surveys are used to determine whether this Stock Component is in a low or a high productivity state and catch advice is then made on this basis. Since 2019, indices from the current year have been used to make such determinations for this subannual species.

##### b) Data and Results

During 2012-2015, catches were the lowest on record and averaged only 27 t, but then gradually increased to 10 567 t in 2021; the highest catch since 1997 and well-above the 1982-2016 low productivity period average (2 510 t, (Fig. 21.1). However, catches in Subareas 3+4 plummeted to 36 t in 2022, which was attributable to a large decrease in Subarea 3 fishing effort, similar to 1997 (Fig. 21.2). US catches from the Southern Stock Component also increased between 2017 and 2021, but catch quotas also increased during this time period. During 2000-2021 only 4% of the 34 000-t TAC for Subareas 3+4 was harvested on average, with a peak harvest of 31% in 2021.

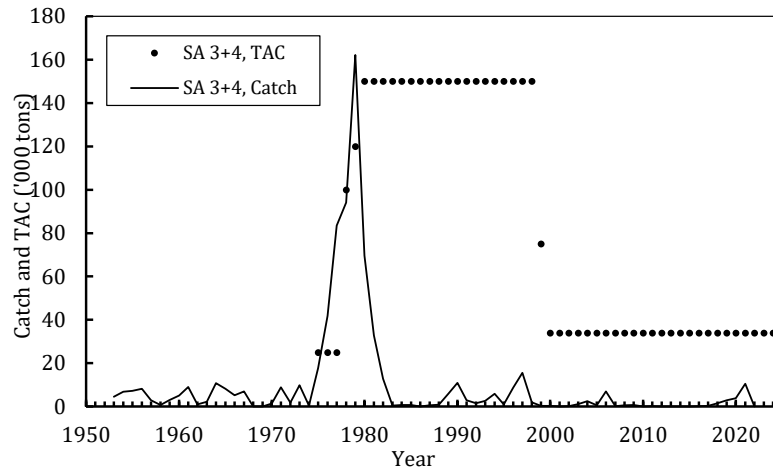
Recent catches and TACs ('000 t) are as follows:

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
<b>TAC SA 3+4</b>	34	34	34	34	34	34	34	34	34	34
<b>STATLANT 21 SA 3+4</b>	0.1 <sup>1</sup>	0.1 <sup>1</sup>	<0.1 <sup>1</sup>	<0.1 <sup>1</sup>	0.4 <sup>1</sup>	1.4 <sup>1</sup>	2.8 <sup>1</sup>	3.9 <sup>1</sup>	10.7 <sup>1</sup>	<0.1 <sup>1</sup>
<b>STATLANT 21 SA 5+6<sup>2</sup></b>	3.8	8.8	2.4	6.7	22.5	24.1	27.2	28.4	30.9	5.7
<b>STACFIS SA 3+4</b>	<0.1	<0.1	<0.1	0.2	0.4	1.5	2.9	3.9	10.5	<0.1
<b>STACFIS SA 5+6<sup>2</sup></b>	3.8	8.8	2.4	6.7	22.5	24.1	27.2	28.4	30.9	5.7
<b>STACFIS Total SA 3-6<sup>3</sup></b>	3.8	8.8	2.4	6.9	22.9	25.6	30.1	32.3	41.4	5.7

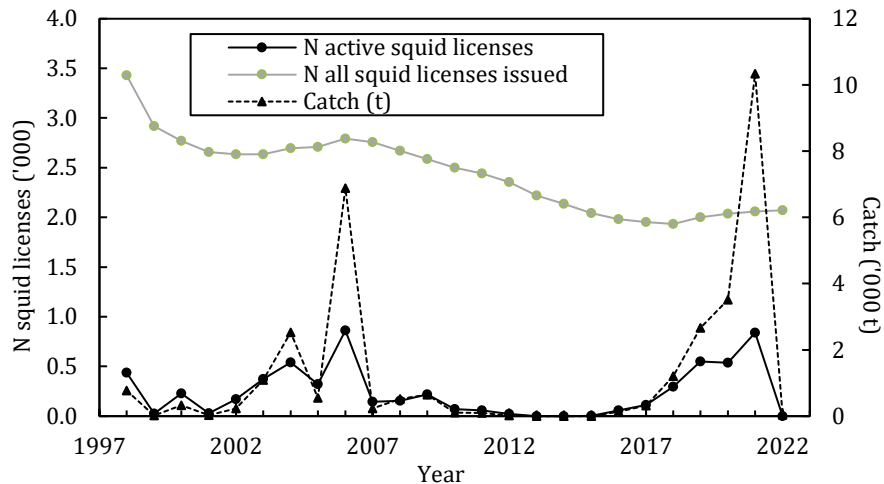
<sup>1</sup> Includes catches (<0.1 t to 56 t during 2013-2022) reported as 'Unspecified Squid' from Subarea 4 because they were likely *I. illecebrosus* based on the geographic distribution of this species versus *Doryteuthis pealeii*.

<sup>2</sup> Catches from Subareas 5+6 are included because there is no basis for considering separate stocks in Subareas 3+4 and Subareas 5+6. USA STATLANT 21 catches were not reported to NAFO for any species during 2019 and 2020.

<sup>3</sup> STACFIS Total SA 3-6 catches were computed as catches harvested in the NAFO Convention Area (2013-2017 from the STATLANT 21 database; 2018 onward from NAFO CESAG database) plus catches recorded in the USA and CA (Newfoundland and Maritimes Regions) commercial landings databases.



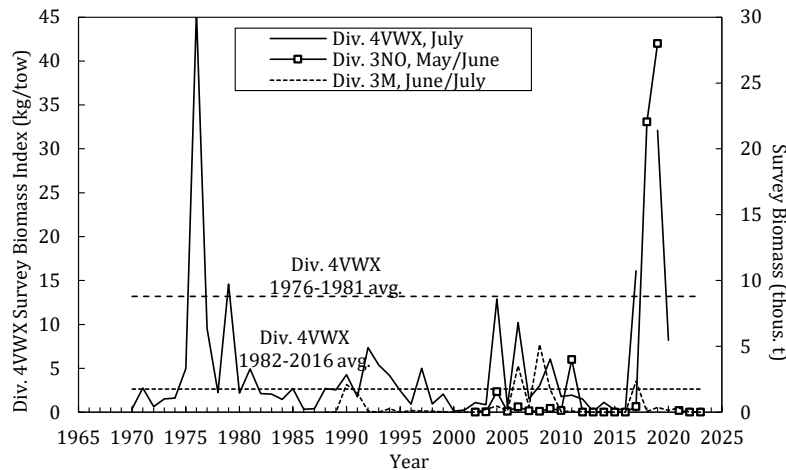
**Figure 21.1.** Northern shortfin squid nominal catches and TACs for Subareas 3+4.



**Figure 21.2.** Northern shortfin catches and numbers of squid licenses issued and active in Subarea 3.

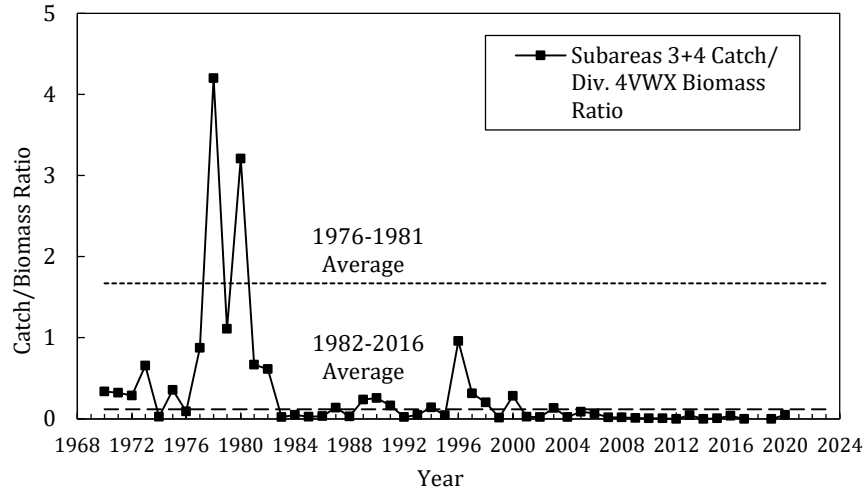


Relative biomass indices for the July Div. 4VWX surveys exhibited several distinct periods. Biomass indices averaged 13.2 kg per tow during the high productivity period (1976-1981) and 2.6 kg per tow during the low productivity period (1982-2016). During 2017, biomass indices increased to the third highest level of the time and was above the high productivity period average (Fig. 21.3). Persistence of the high 2017 biomass level could not be confirmed in 2018 because a biomass index was not computed due to inadequate sampling of *Illex* habitat because of survey vessel mechanical problems. The 2019 biomass index was twice as high (32.1 kg per tow) as the 2017 index and was the second highest value in the time series. During 2020, the biomass index (8.2 kg per tow) dropped below the high productivity period average, but remained higher than all but two of the biomass indices during 1982-2016 low productivity period. Because the 2021-2023 biomass indices for the July Div. 4VWX survey could not be standardized with the rest of the time series, the 2021-2023 trends in two other series of summer biomass indices for Subareas 3+4, biomass indices for Divs. 3NO and 3M, are presented and they indicate that biomass levels for both time series were at their lowest during these years (Fig. 21.3).



**Figure 21.3.** Northern shortfin squid in Subareas 3+4: biomass indices from summer surveys conducted in Divs. 4VWX, 3M and 3NO.

Catch/biomass ratios (SA 3+4 nominal catch/Division 4VWX July survey biomass index) / 10 000) have consistently been well below the 1982-2016 mean (0.12) since 2004 and the ratio was 0.05 in 2020 (Fig. 21.4). There are no Div. 4VWX biomass indices available for 2021-2023 for the reasons previously described and current-year catches are not available. Consequently, there are no catch/biomass ratios available for 2021-2023.



**Figure 21.4.** Northern shortfin squid in Subareas 3+4: catch/biomass ratios (SA 3+4 nominal catch/Division 4VWX July survey biomass index) / 10 000).

### c) Conclusion

The biomass index for the July Div. 4VWX surveys are not available for 2021-2023 because conversion factors for the new survey vessel and trawl gear are not yet available to standardize the indices for these years with the remainder of the time series. However, the 2021-2023 trends in two other time series of summer biomass indices for Subareas 3+4 (i.e., biomass indices for Divs. 3NO and 3M) were at their lowest levels during these years. Based on these findings, the Northern Stock Component remained in a low productivity state during 2023.

The next assessment is planned for 2025.

## III. OTHER MATTERS

### 1. Nomination of Designated Experts (DE)

SC reviewed the current DE list.

**Designated Experts for 2023/2024:****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
Redfish Div. 3O	Laura Wheeland	laura.wheeland@dfo-mpo.gc.ca
Redfish 3LN	Andrea Perreault	andrea.perreault@dfo-mpo.gc.ca
American Plaice in Div. 3LNO	Laura Wheeland	laura.wheeland@dfo-mpo.gc.ca
Witch flounder in Div. 3NO	Dawn Maddock Parsons	dawn.parsons@dfo-mpo.gc.ca
Yellowtail flounder in Div. 3LNO	Dawn Maddock Parsons	dawn.parsons@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
Ecosystem Designated expert 3LNO	Robert Deering*	robert.deering@dfo-mpo.gc.ca

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

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

**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
Greenland halibut in SA 0+1 (offshore)	Adriana Nogueira	adno@natur.gl
Northern shrimp in SA 0+1	AnnDorte Burmeister	anndorte@natur.gl
Northern shrimp in Denmark Strait	Tanja 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
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**From National Marine Fisheries Service, NEFSC, Woods Hole, Massachusetts, United States of America**

Northern Shortfin Squid in SA 3 & 4	Lisa Hendrickson	lisa.hendrickson@noaa.gov
Thorny skate in Div. 3LNO	Katherine Sosebee	katherine.osebee@noaa.gov
White hake in Div. 3NO	Katherine Sosebee	katherine.osebee@noaa.gov

\*To be confirmed



## 2. Other matters

### a) Review of SCR and SCS Documents

No SCRs were submitted to this meeting.

### b) FIRMS Classification for NAFO Stocks

STACFIS 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
<b>Virgin-Large</b>	3LNO Yellowtail Flounder			
<b>Intermediate</b>	3LN Redfish 3LNOPs Thorny skate	SA0+1 Northern shrimp <sup>1</sup> 3M Redfish <sup>1</sup> SA2+3KLMNO Greenland halibut 3M cod	East Greenland Northern shrimp	SA1 American Plaice SA1 Spotted Wolffish
<b>Small</b>	3NOPs White hake 3NO Witch flounder			
<b>Depleted</b>	3M American plaice 3LNO American plaice 3NO Cod 3LNO Northern shrimp 3M Northern shrimp <sup>2</sup> 6G Alfonsino			SA1 Redfish SA1 Atlantic Wolffish
<b>Unknown</b>	SA2+3 Roughhead grenadier 3NO Capelin 3O Redfish SA 0+1 (Offshore) Greenland halibut Greenland halibut in Disko Bay Greenland halibut in Uummanaq Greenland halibut in Upernavik	1B-C Greenland halibut Inshore	1D Greenland halibut Inshore 1E-F Greenland halibut Inshore	SA3+4 Northern shortfin squid

<sup>1</sup> Fishing mortality may not be the main driver of biomass for Div. 3M Shrimp and Redfish  
For many stocks, lack of surveys in recent years has impacted assessments.

## 3. Other business

No other items were discussed.

## IV. ADJOURNMENT

The meeting was adjourned on 21 September 2022.

## APPENDIX III. PROVISIONAL AGENDA

### Scientific Council Provisional Agenda

#### I. Plenary Session (Scientific Council Chair: Karen Dwyer)

1. Opening
2. Appointment of Rapporteur
3. Adoption of Agenda
4. Plan of Work

#### II. Review of Scientific Council Recommendations

#### III. Joint Session of Commission and Scientific Council

1. Implementation of 2018 Performance Review Panel recommendations
2. Presentation of scientific advice by the Chair of the Scientific Council
  - a. Response of the Scientific Council to the Commission's request for scientific advice
  - b. Feedback to the SC regarding the advice and its work during this meeting
  - c. Other issues as determined by the Chair of the Commission and of the Scientific Council
3. Meeting Reports and Recommendations of the Joint Commission–Scientific Council Working Groups
  - a. Working Group on Improving Efficiency of NAFO Working Group Process (E-WG), 2023
  - b. Joint Commission–Scientific Council Working Group on Risk-based Management Strategies (WG-RBMS), April and July 2023
  - c. Joint Commission–Scientific Council Working Group on Ecosystems Approach Framework to Fisheries Management (WG-EAFFM), July 2023
  - d. Joint Commission–Scientific Council Catch Estimation Strategy Advisory Group (CESAG), 2023
  - e. Informal Group to reflect on the workload of the Scientific Council, April 2023
4. Formulation of Request to the Scientific Council for Scientific Advice on Management in 2025 and beyond of Certain Stocks in Subareas 2, 3 and 4 and Other Matters

#### IV. Research Coordination (STACREC Chair: Diana González-Troncoso)

1. Opening
2. Appointment of Rapporteur
3. Fisheries Statistics
  - a. Progress Reports on Secretariat Activities
  - b. Review of STATLANT21 Research Activities
4. Research Activities
  - a. Surveys Planned for 2024 and 2025
5. Other Matters
  - a. Review of SCR and SCS Documents
  - b. Review of Survey SCS Document
  - c. Other Business
    - i. Reviewers for June 2024: topics
    - ii. Data availability (open access, Share Point access, etc.) and format (submission of data, NAFOdown)
6. Adjournment

#### V. Fisheries Science (STACFIS Chair: Mark Simpson)

1. Opening
2. Nomination of Designated Experts
3. Other Matters

- a. Review of SCR and SCS Documents
- b. Assessments deferred from the June meeting
  - i. Northern shortfin squid in SA 3+4 (interim monitoring)
- c. Review of FIRMS classification of NAFO stocks
- d. Other Business

## **VI. Requests from the Commission**

1. Requests/advice deferred from the June Meeting
  - a. Presentation of any new results from stock assessments and the scientific advice of pelagic *Sebastes mentella* (ICES Divisions V, XII and XIV; NAFO 1) (request #9)
  - b. Requests arising from Working Groups in 2023
2. *Ad hoc* Requests from Current Meeting
3. Further progress on items related to COM requests (in SCS Doc. 23/01)
  - a. 3-5 year work plan (Commission request #8)
  - b. Continued work on the PA Review (Commission request #7)

## **VII. Review of Future Meeting Arrangements**

## **VIII. Future Special Sessions**

1. Discussion of proposed topics
  - a. Flatfish symposium 2024
  - b. FAO/NAO Ecosystem workshop 2025
  - c. Other proposed topics

## **IX. Other Matters**

1. Meeting reports
  - a. ICES/NAFO Working Group on Deep-water Ecology (WG-DEC)
  - b. ICES/NAFO/NAMMCO Working Group on Harp and Hooded Seals (WG-HARP)
2. Any other business

## **X. Adoption of Reports**

1. Committee Reports of STACFIS and STACREC
2. Report of Scientific Council

## **XI. Adjournment**

**ANNEX 1. COMMISSION'S REQUEST FOR SCIENTIFIC ADVICE ON MANAGEMENT IN 2024 AND BEYOND OF CERTAIN STOCKS IN SUBAREAS 2, 3 AND 4 AND OTHER MATTERS**

(From SC Doc. 23/01)

Following a request from the Scientific Council, the Commission agreed that items 1, 2, 4 and 7 should be the priority for the June 2023 Scientific Council meeting subject to resources and COVID-related restrictions.

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 keeping with the NAFO Precautionary Approach Framework (FC Doc. 04/18), the advice should be provided as a range of management options and a risk analysis for each option without a single TAC recommendation. The Commission will decide upon the acceptable risk level in the context of the entirety of the SC advice for each stock guided and as foreseen by the Precautionary Approach.

Yearly basis	Two-year basis	Three-year basis
Cod in Div. 3M Northern shrimp in Div. 3M	Redfish in Div. 3M Thorny skate in Div. 3LNO Witch flounder in Div. 3NO Redfish in Div. 3LN White hake in Div. 3NO Yellowtail flounder in Div. 3LNO Northern shrimp in Div. 3LNO	American plaice in Div. 3LNO American plaice in Div. 3M Northern shortfin squid in SA 3+4 Redfish in Div. 3O Cod in Div. 3NO

Advice should be provided using the guidance provided in **Annexes A or B as appropriate**, or using the predetermined Harvest Control Rules in the cases where they exist (currently Greenland halibut 2+3KLMNO). However, for 3M shrimp supplementary advice in terms of fishing-days should also be considered to the extent feasible.

To implement this schedule of assessments, the Scientific Council is requested to conduct a full assessment of these stocks as follows:

- In 2023, advice should be provided for 2024 for Cod in Div. 3M and Northern shrimp in Div. 3M.
- With respect to Northern shrimp in Div. 3M, Scientific Council is requested to provide its advice to the Commission prior to the 2023 Annual Meeting based on the survey data up to and including 2023.
- In 2023, advice should be provided for 2024 and 2025 for: Redfish in Div. 3M, White hake in Div. 3NO, Yellowtail flounder in Div. 3LNO and Northern shrimp in Div. 3LNO.
- In 2023, advice should be provided for 2024, 2025 and 2026 for: American plaice in Div. 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 + Div 3KLMNO annually to compute the TAC using the agreed HCR 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 continue its evaluation of the impact of scientific trawl surveys on VME in closed areas and the effect of excluding surveys from these areas on stock assessments.



4. The Commission requests that Scientific Council continue to advance work on the 2+3KLMNO Greenland halibut and 3LN redfish MSE processes during 2022-2023, as per the approved 2023 workplan [COM-SC RBMS WP 22/07], in particular :
  - a. Review and finalize the data series to be used for the two MSEs;
  - b. For the Greenland Halibut MSE: (1) propose, review and finalize Operating Models (OMs) to be used; and (2) Test Candidate Management Procedures (CMPs) to support the RBMS recommendation of an HCR to the Commission; and
  - c. For the 3LN Redfish MSE: (1) Proposal of an initial review of Operating Models; and (2) work to support the development of performance statistics and CMPs.
  
5. The Commission requests that the Scientific Council continue to work on tiers 1 and 2 of the Roadmap, specifically to:
  - a. Include on a regular basis summary information on TCI in stock summary sheets (including indications of other NAFO managed stocks within the corresponding guild) and ecosystem summary sheets.
  - b. Work to support WG-EAFFM in exploring:
    - i. Management considerations for occasions in which the 2TCI ecosystem reference point were to be exceeded, similar to those when exceptional circumstances are triggered within MSE.
    - ii. Effective methods to communicate TCI-related information to the Commission, in particular for when 2TCI is, or expected to be exceeded.
  - c. Complete the development of the 3LNO ecosystem summary sheet (ESS), advance as much as possible the development of the 3M ESS, and continue working, if capacity allows, toward undertaking a joint Workshop with ICES (International Council for the Exploration of the Sea) on reporting on North Atlantic ecosystems.
  
6. In relation to the habitat impact assessment component of the Roadmap (VME and SAI analyses), the Commission requests that Scientific Council to:
  - a. Complete the re-assessment of its previously recommended closures of 7a, 11a, 14a and 14b, incorporating catch and effort data for fisheries of shrimp from 2020 and 2021 into the fishing impact assessments. This work is needed for the 2023 WG-EAFFM meeting;
  - b. Support the Secretariat in creating standardized data layers (using GIS), and products with supporting documentation (including metadata) for periodic reassessment purposes required to support the implementation of the NAFO Roadmap towards an Ecosystem Approach; and
  - c. Continue working with WG-EAFFM towards developing operational objectives for the protection of VMEs and biodiversity in the NRA.
  
7. The Commission requests Scientific Council to continue progression on the review of the NAFO PA Framework in accordance to the PAF review work plan approved in 2020 and revised in 2022 (NAFO COM-SC Doc. 20-04), specifically:
  - a. Develop a small set of revised PA frameworks based on the conclusions of the first PA Framework workshop to inform RBMS in proposing a draft revised framework in 2023; and

- b. Apply in an illustrative way the revised PA frameworks to selected NAFO stocks, and consider how the SC advice may have differed under the revised PA Frameworks to inform RBMS in proposing a draft revised framework in 2023
8. The Commission requests Scientific Council to update the 3-5 year work plan, which reflects requests arising from the 2022 Annual Meeting, other multi-year stock assessments and other scientific inquiries already planned for the near future. The work plan should identify what resources are necessary to successfully address these issues, gaps in current resources to meet those needs and proposed prioritization by the Scientific Council of upcoming work based on those gaps.
9. The Commission requests that any new results from stock assessments and the scientific advice of Pelagic *Sebastes mentella* (ICES Divisions V, XII and XIV; NAFO 1) to be presented to the Scientific Council, and request the Scientific Council to prepare a summary of these assessments to be included in its annual report.
10. The Commission requests that any new Canadian stock assessments for Cod 2J3KL and Witch flounder 2J3KL be included as an annex to the Scientific Council's annual report.
11. The Commission requests Scientific Council, jointly with the Secretariat, to conduct ongoing analysis of the Flemish Cap cod fishery data by 2023 in order to:
  - a. monitor the consequences of the management decisions (including the analysis of the redistribution of the fishing effort along the year and its potential effects on ecosystems, the variation of the cod catch composition in lengths/ages, and the bycatch levels of other fish species, benthos in general, and VME taxa in particular); and
  - b. carry out any additional monitoring that would be required, including Div. 3M cod caught as bycatch in other fisheries during the closed period.
12. The Commission requests Secretariat and the Scientific Council with other international organizations, such as the FAO and ICES to inform the Scientific Council's work related to the potential impact of activities other than fishing in the Convention Area. This would be conditional on CPs providing appropriate additional expertise to Scientific Council.

**ANNEX A: Guidance for providing advice on Stocks Assessed with an Analytical Model**

The Commission request 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 Fisheries Commission to consider the balance between risks and yield levels, in determining its management of these stocks:

1. For stocks assessed with a production model, the advice should include updated time series of:
  - Catch and TAC of recent years
  - Catch to relative biomass
  - Relative Biomass
  - Relative Fishing mortality
  - Stock trajectory against reference points
  - And any information the Scientific Council deems appropriate.

Stochastic short-term projections (3 years) should be performed with the following constant fishing mortality levels as appropriate:

- For stocks opened to direct fishing:  $2/3 F_{msy}$ ,  $3/4 F_{msy}$ ,  $85\% F_{msy}$ ,  $90\% F_{msy}$ ,  $95\% F_{msy}$ ,  $F_{msy}$ ,  $0.75 \times F_{status\ quo}$ ,  $F_{status\ quo}$ ,  $1.25 \times F_{status\ quo}$ ,  $F=0$ ; TAC  $status\ quo$ ,  $85\% TAC\ status\ quo$ ,  $90\% TAC\ status\ quo$ ,  $95\% TAC\ status\ quo$
- For stocks under a moratorium to direct fishing:  $F_{status\ quo}$ ,  $F = 0$ .

The first year of the projection should assume a catch equal to the agreed TAC for that year.

Results from stochastic short-term projection should include:

- The 10%, 50% and 90% percentiles of the yield, total biomass, spawning stock biomass and exploitable biomass for each year of the projections
- The risks of stock population parameters increasing above or falling below available biomass and fishing mortality reference points. The table indicated below should guide the Scientific Council in presenting the short-term projections.

Limit reference points

F in 2023 and following years*	Yield 2023 (50 %)	Yield 2024 (50 %)	Yield 2025 (50 %)	Limit reference points						P(F>F <sub>msy</sub> )			P(B<B <sub>msy</sub> )			P(B <sub>2026</sub> >B <sub>2023</sub> )
				P(F>F <sub>lim</sub> )			P(B<B <sub>lim</sub> )									
				2023	2024	2025	2023	2024	2025	2023	2024	2025	2023	2024	2025	
$2/3 F_{msy}$	t	t	t	%	%	%	%	%	%	%	%	%	%	%	%	%
$3/4 F_{msy}$	t	t	t	%	%	%	%	%	%	%	%	%	%	%	%	%
$85\% F_{msy}$	t	t	t	%	%	%	%	%	%	%	%	%	%	%	%	%
$90\% F_{msy}$																
$95\% F_{msy}$																
$F_{msy}$	t	t	t	%	%	%	%	%	%	%	%	%	%	%	%	%
$0.75 \times F_{status\ quo}$	t	t	t	%	%	%	%	%	%	%	%	%	%	%	%	%
$F_{status\ quo}$	t	t	t	%	%	%	%	%	%	%	%	%	%	%	%	%
$1.25 \times F_{status\ quo}$	t	t	t	%	%	%	%	%	%	%	%	%	%	%	%	%
$F=0$	t	t	t	%	%	%	%	%	%	%	%	%	%	%	%	%
$TAC_{status\ quo}$																
$85\% TAC_{status\ quo}$																
$90\% TAC_{status\ quo}$																
$95\% TAC_{status\ quo}$																



2. 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 reference points
- And any information the Scientific Council deems appropriate

Stochastic short-term projections (3 years) should be performed with the following constant fishing mortality levels as appropriate:

- For stocks opened to direct fishing:  $F_{0.1}$ ,  $F_{max}$ ,  $2/3 F_{max}$ ,  $3/4 F_{max}$ ,  $85\% F_{max}$ ,  $75\% F_{status\ quo}$ ,  $F_{status\ quo}$ ,  $125\% F_{status\ quo}$ ,
  - For stocks under a moratorium to direct fishing:  $F_{status\ quo}$ ,  $F = 0$ .

The first year of the projection should assume a catch equal to the agreed TAC for that year.

Results from stochastic short-term projection should include:

- The 10%, 50% and 90% percentiles of the yield, total biomass, spawning stock biomass and exploitable biomass for each year of the projections
- The risks of stock population parameters increasing above or falling below available biomass and fishing mortality reference points. The table indicated below should guide the Scientific Council in presenting the short-term projections.

F in 2023 and following years*	Yield 2023	Yield 2024	Yield 2025	Limit reference points						P(F>F <sub>0.1</sub> )			P(F>F <sub>max</sub> )			P(B <sub>2026</sub> > B <sub>2023</sub> )
				P(F.>F <sub>lim</sub> )			P(B<B <sub>lim</sub> )			2023	2024	2025	2023	2024	2025	
				2023	2024	2025	2023	2024	2025							
F <sub>0.1</sub>	t	t	t	%	%	%	%	%	%	%	%	%	%	%	%	%
F <sub>max</sub>	t	t	t	%	%	%	%	%	%	%	%	%	%	%	%	%
66% F <sub>max</sub>	t	t	t	%	%	%	%	%	%	%	%	%	%	%	%	%
75% F <sub>max</sub>	t	t	t	%	%	%	%	%	%	%	%	%	%	%	%	%
85% F <sub>max</sub>	t	t	t	%	%	%	%	%	%	%	%	%	%	%	%	%
0.75 X F <sub>status quo</sub>	t	t	t	%	%	%	%	%	%	%	%	%	%	%	%	%
F <sub>status quo</sub>	t	t	t	%	%	%	%	%	%	%	%	%	%	%	%	%
1.25 X F <sub>status quo</sub>	t	t	t	%	%	%	%	%	%	%	%	%	%	%	%	%





**ANNEX B. Guidance for providing advice on Stocks Assessed without a Population Model**

For those resources 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 one or several surveys, for the longest time-period possible:

- a. time trends of survey abundance estimates
- b. an age or size range chosen to represent the spawning population
- c. an age or size-range chosen to represent the exploited population
- d. recruitment proxy or index for an age or size-range chosen to represent the recruiting population.
- e. fishing mortality proxy, such as the ratio of reported commercial catches to a measure of the exploited population.
- f. Stock trajectory against reference points

And any information the Scientific Council deems appropriate.

**ANNEX 2. DESIGNATED EXPERTS IN 2023****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
Redfish Div. 3O	Laura Wheeland	laura.wheeland@dfo-mpo.gc.ca
Redfish 3LN	Andrea Perreault	andrea.perreault@dfo-mpo.gc.ca
American Plaice in Div. 3LNO	Laura Wheeland	laura.wheeland@dfo-mpo.gc.ca
Witch flounder in Div. 3NO	Dawn Maddock Parsons	dawn.parsons@dfo-mpo.gc.ca
Yellowtail flounder in Div. 3LNO	Dawn Maddock Parsons	dawn.parsons@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	katherine.skane@dfo-mpo.gc.ca

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

Roughhead grenadier in SA 2+3	Fernando Gonzalez-Costas	fernando.gonzalez@ieo.csic.es
Splendid alfonsino in Subarea 6	Fernando Gonzalez-Costas	fernando.gonzalez@ieo.csic.es
Cod in Div. 3M	Irene Garrido Fernández	irene.garrido@ieo.csic.es
Shrimp in Div. 3M	Jose Miguel Casas Sanchez	mikel.casas@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

**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
Greenland halibut in SA 0+1 (offshore)	Adriana Nogueira	adno@natur.gl
Northern shrimp in SA 0+1	AnnDorte Burmeister	anndorte@natur.gl
Northern shrimp in Denmark Strait	Tanja 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
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**From National Marine Fisheries Service, NEFSC, Woods Hole, Massachusetts, United States of America**

Northern Shortfin Squid in SA 3 & 4	Lisa Hendrickson	lisa.hendrickson@noaa.gov
Thorny skate in Div. 3LNO	Katherine Sosebee	katherine.osebee@noaa.gov
White hake in Div. 3NO	Katherine Sosebee	katherine.osebee@noaa.gov

**ANNEX 3. DENMARK (ON BEHALF OF GREENLAND) COASTAL STATE REQUEST  
FOR SCIENTIFIC ADVICE - 2024**

(from [SCS Doc. 23/03](#))

Denmark (on behalf of Greenland) hereby requests for scientific advice on management in 2024 of certain stocks in NAFO Subareas 0 and 1. Denmark (on behalf of Greenland) requests the Scientific Council for advice on the following species:

**1. Golden Redfish and Demersal Deep-Sea Redfish**

Advice on Golden redfish (*Sebastes marinus*) and demersal deep-sea redfish (*Sebastes mentella*) in Subarea 1 was in June 2020 given for 2021-2023. The Scientific Council is requested to provide advice on appropriate TAC levels for 2024 to 2026.

**2. Atlantic Wolffish and Spotted Wolffish**

Advice on Atlantic Wolffish (*Anarhichas lupus*) and Spotted Wolffish (*Anarhichas minor*) in Subarea 1 was in June 2020 given for 2021-2023. The Scientific Council is requested to provide advice on appropriate TAC levels for 2024 to 2026.

**3. Greenland Halibut, Offshore**

Advice on Greenland Halibut, Offshore in Subareas 0 and 1 was in 2022 given for 2023 and 2024. The Scientific Council is requested to evaluate whether the data collected in 2022 is sufficient to reconsider the harvest recommendation for 2024. If so, the Scientific Council is requested to provide updated advice on appropriate TAC levels for 2024, taking the new data into account.

**4. Greenland Halibut, Inshore, West Greenland**

Advice on the inshore stocks of Greenland Halibut in Subarea 1 was in 2022 given for 2023-2024. The Scientific Council is requested to continue its monitoring of the above stocks and provide updated advice in the event of significant changes in stock levels. Scientific Council are also requested to evaluate the performance of an appropriate analytical assessment model and its perception of the stock trajectory.

**5. Northern Shrimp, West Greenland**

The Scientific Council is requested, before October, to provide advice on the scientific basis for management of Northern Shrimp (*Pandalus borealis*) in Subareas 0 and 1 in 2024. The advice is requested to be in line with Greenland's stated management objective of maintaining a mortality risk of no more than 35% in the first-year prediction and to provide a catch option table ranging with 5,000 tonne increments. Future catch options should be provided for as many years as data allows for.

**6. Northern Shrimp, East Greenland**

The Scientific Council is in cooperation with ICES 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 2023 and for as many years ahead as data allows for.

#### ANNEX 4. CANADA'S REQUEST FOR COASTAL STATE ADVICE - 2024

(from [SCS Doc. 23/04](#))

Canada would like to submit its request to the Scientific Council for advice on the following species:

1. Greenland halibut (Subarea 0 + 1 (offshore))

In 2022, advice on Greenland Halibut in Subareas 0 and 1 (offshore) was given for 2023 and 2024. The Scientific Council is requested to evaluate whether the data collected in 2022 is sufficient to reconsider the harvest recommendation for 2024. If so, the Scientific Council is requested to provide an updated assessment of status and trends in the total stock area throughout its range and to advise on the 2024 TAC level.

2. Shrimp (Subarea 1 and Division 0A)

Canada requests the Scientific Council to consider the following options in assessing and projecting future stock levels for Shrimp in Subarea 1 and Division 0A:

The status of the stock should be determined and risk-based advice provided for catch options corresponding to  $Z_{msy}$ , in 5,000-10,000t increments (subject to the discretion of Scientific Council), with forecasts for 2024 to 2026. These options should be evaluated in relation to Canada's Harvest Strategy (2022 revised version attached) and NAFO's Precautionary Approach Framework, and presented in the form of risk analyses related to  $B_{msy}$ , 80%  $B_{msy}$ ,  $B_{lim}$  (30%  $B_{msy}$ ) and  $Z_{msy}$ .

Presentation of the results should include graphs and/or tables related to the following:

- Historical and current yield, biomass relative to  $B_{msy}$ , total mortality relative to  $Z_{msy}$ , 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 2024 to 2026. 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:  $B_{MSY}$ , 80%  $B_{msy}$  and  $B_{lim}$  (30%  $B_{msy}$ ), and of being above  $Z_{msy}$  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).

**APPENDIX IV. LIST OF SUMMARY (SCS) DOCUMENTS****Summary Documents (SCS)**

<b>SCS Doc. No.</b>	<b>Serial No.</b>	<b>Author(s)</b>	<b>Title</b>
SCS Doc. 23/22	N7481	NAFO	Report of the Scientific Council Meeting 18-22 September 2023
SCS Doc. 23/23	N7482	NAFO	Available Data from the Commercial Fisheries Related to Stock Assessment (2022) and Inventory of Biological Surveys Conducted in the NAFO Area in 2022 and Biological Surveys Planned for 2023 and Early-2024
SCS Doc. 23/24	N7483	NAFO	A Compilation of Research Vessel Surveys on a Stock-by-stock Basis

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