



NORTHWEST ATLANTIC
FISHERIES ORGANIZATION

Meeting Proceedings of the Commission

18 May–31 August 2017

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FOREWORD

This issue of the Proceedings contains the meeting reports of the the Commission (COM) including their subsidiary bodies and working groups held in the four months preceding the Annual Meeting in September 2017 (between 18 May 2017 and 31 August 2017). This follows a NAFO cycle of meetings starting with an Annual Meeting rather than by calendar year.

This present 2017 issue is comprised of the following sections:

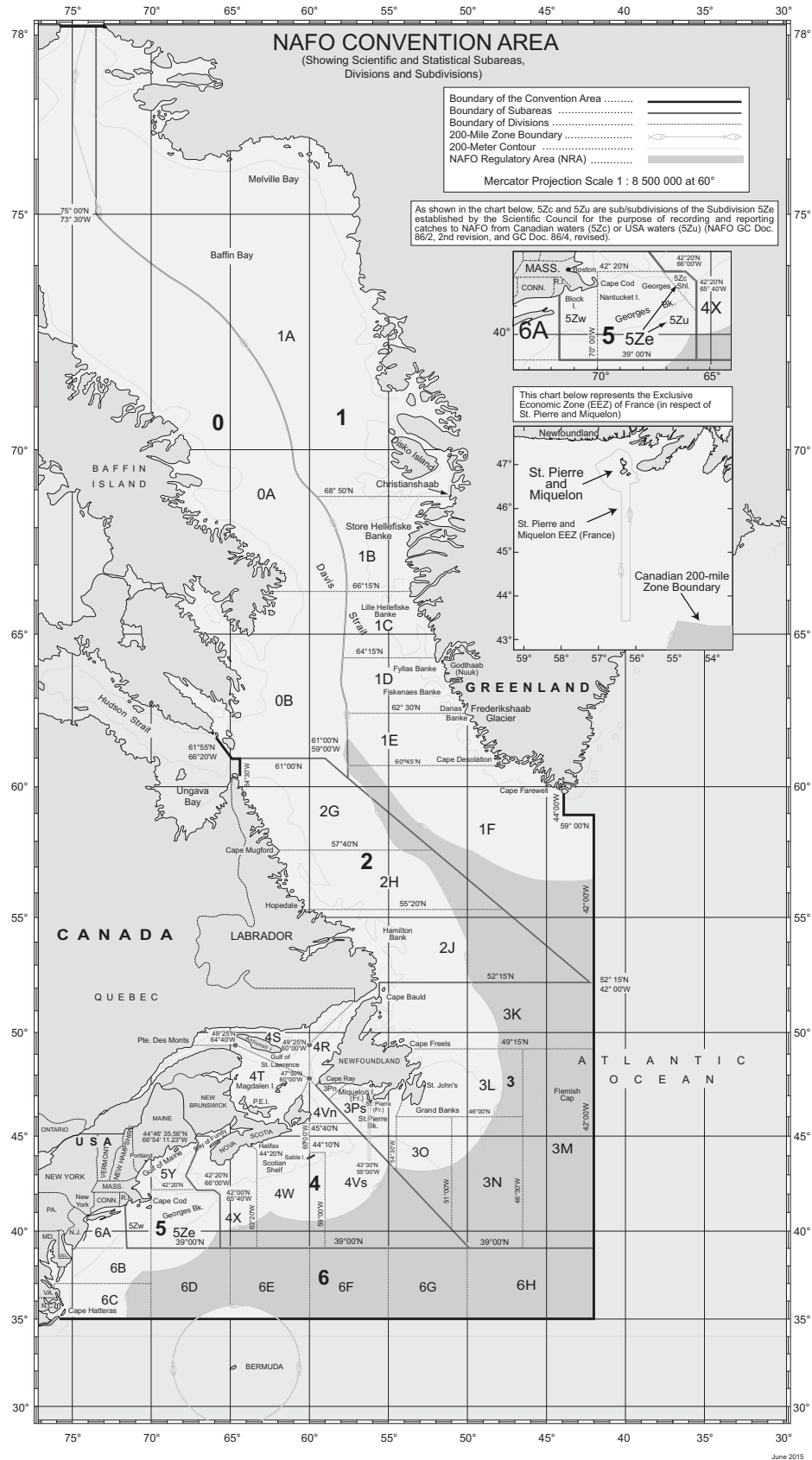
SECTION I (pages 1–8) Report of the NAFO Working Group on Improving Efficiency of NAFO Working Group Process (E-WG) Meeting, via Webex.

SECTION II (pages 9–22) contains the Report of the NAFO Commission Ad hoc Working Group to Reflect on the Rules Governing Bycatches, Discards and Selectivity (WG-BDS) in the NAFO Regulatory Area, 10 July 2017, NAFO Secretariat, Dartmouth, NS, Canada.

SECTION III (pages 23–35) contains the Report of the NAFO Joint Commission-Scientific Council Working Group on Risk-Based Management Strategies (WG-RBMS), 11–13 July 2017, NAFO Secretariat, Dartmouth, NS, Canada.

SECTION IV (pages 37–52) contains the Report of the NAFO Joint Commission-Scientific Council Working Group on Ecosystem Approach Framework to Fisheries Management (WG-EAFFM), 14 July 2017, NAFO Secretariat, Dartmouth, NS, Canada.

SECTION V (pages 53–58) Report of the NAFO Joint Commission-Scientific Council Working Group on Catch Reporting (WG-CR) and NAFO Ad hoc Joint Commission-Scientific Council Catch Data Advisory Group (CDAG) Meeting, April, May and August 2017, via Webex.



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STRUCTURE OF THE NORTHWEST ATLANTIC FISHERIES ORGANIZATION (NAFO)

(18 May to 31 August 2017)

CONTRACTING PARTIES

Canada, Cuba, Denmark (in respect of the Faroe Islands and Greenland), European Union (EU), France (in respect of St.-Pierre et Miquelon), Iceland, Japan, Norway, Republic of Korea, Russian Federation, Ukraine and United States of America (USA).

PRESIDENT

Stéphane Artano (France in respect of St. Pierre et Miquelon)

CONSTITUENT BODIES

Commission *Chair* – Stéphane Artano (France in respect of St.-Pierre et Miquelon)
Vice-Chair – Temur Tairov (Russian Federation)

Scientific Council *Chair* – Katherine Sosebee (USA)
Vice-Chair – Brian Healey (Canada)

STANDING COMMITTEES

Commission Standing Committee on Finance and Administration (STACFAD) *Chair* – Deirdre Warner-Kramer (USA)
Vice-Chair – Élise Lavigne (Canada)

Standing Committee on International Control (STACTIC) *Chair* – Judy Dwyer (Canada)
Vice-Chair – Aronne Spezzani (EU)

Scientific Council Standing Committee on Fishery Science (STACFIS) *Chair* – Joël Vigneau (EU)
Standing Committee on Research and Coordination (STACREC) *Chair* – Brian Healey (Canada)
Standing Committee on Publications (STACPUB) *Chair* – Margaret Treble (Canada)
Standing Committee on Fisheries Environment (STACFEN) *Chair* – Andrew Cogswell (Canada)

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Northwest Atlantic Fisheries Organization



**Report of the NAFO Working Group on Improving Efficiency of
NAFO Working Group Process (E-WG) Meeting**

2017
via WebEx

NAFO
Dartmouth, Nova Scotia, Canada
2017

Report of the NAFO Working Group on Improving Efficiency of NAFO Working Group Process (E-WG) Meeting

2017
via WebEx

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Report of the NAFO Working Group on Improving Efficiency of NAFO Working Group Process (E-WG) Meeting

2017
via WebEx

1. Opening by the Chair, Fred Kingston (NAFO Secretariat)

The meeting of the Working Group on Improving Efficiency of NAFO Working Group Process (E-WG) was opened on 28 June 2017 at 09:00 hours (Atlantic Daylight Time) via WebEx. The NAFO Executive Secretary and meeting Chair, Fred Kingston, welcomed all delegates to the meeting (Annex 1).

2. Appointment of Rapporteur

The NAFO Secretariat was appointed rapporteur.

3. Adoption of Agenda

The agenda was adopted as circulated (Annex 2).

4. Review schedule for upcoming Joint COM-SC Working Groups for 2017 (FC-SC WP 17-01 Rev. 2)

The Executive Secretary briefly provided an overview of the revised Working Paper, noting that, except for an envisaged meeting of the *Ad hoc* virtual NAFO Website Re-design Working Group: Phase II – Data Classification, all the Working Group meetings for this year have now been scheduled.

5. Review feedback received from Working Group meetings and the STACTIC Intersessional meeting since the last meeting on 30 January 2017 (COM-SC WP 17-02)

The Working Group briefly reviewed the feedback received from three (3) NAFO subsidiary bodies that met since the last E-WG meeting in January 2017. The discussion at these subsidiary bodies' meetings focused on the recommendations of the previous E-WG meeting, namely:

- ***The possibility of allocating two-week time period(s) annually to schedule proposed Working Groups meetings; and***
- ***The development of a clear communication mechanism amongst NAFO's subsidiary bodies to allow improved collaboration between them intersessionally.***

The participants at all three meetings expressed some support for the first recommendation. It was noted that the allocation of two-week time periods should not in any way preclude scheduling meetings outside these periods. It was also suggested that the Secretariat should prepare at every Annual Meeting a proposed meeting calendar indicating possible two-week time periods for the proceeding NAFO year.

Concerning the second recommendation regarding a clearer communication mechanism amongst NAFO subsidiary bodies, the participants at the meetings considered that this was desirable, but more reflection was needed to determine how to do this. In this context, one of the meeting reports stated that an option could be to revise the terms of reference of the various Working Groups and STACTIC to allow the respective Chairs to openly communicate amongst themselves. The Chair of the Scientific Council added that it was useful for her and another member of the Scientific Council to attend the recent meeting of the STACTIC Observer Program Review Working Group to discuss how the Scientific Council could provide input into potential changes to the NAFO observer program that could improve the use of fishery observer data for scientific purposes.

6. Identify mechanisms to improve efficiencies, maximize meeting opportunities and share best practices

Concerning the allocation of a number of two-week time periods, the E-WG considered the allocation of three (3) two-week periods, namely a two-week period around the end of February and the beginning of March; another two-week period around the end of April and the beginning of May, which would include the week for the traditional STACTIC intersessional meeting; and a final two-week period that would alternate annually between the last two full weeks of July and the last two full weeks of August. A July or August period would be required because (at least) the WG-EAFFM should be scheduled after the June SC meeting to take account any advice coming out from that meeting. It would alternate each year between the July and August dates to try to accommodate somewhat the conflicting traditional summer vacation months of a number of CPs. These two-week periods would not require meetings of NAFO subsidiary bodies to meet during those dates nor would they preclude the scheduling of meetings of NAFO subsidiary bodies outside those dates. The Secretariat could propose the specific periods for the upcoming NAFO year at each Annual Meeting for consideration by CPs. If this proposal is acceptable, and once specific periods are proposed, it would also be useful if CPs could check their respective holiday schedules, as well as the known meeting schedules of other RFMOs, to determine during the Annual Meeting whether there are any conflicts and, if so, whether the proposed meeting periods can be adjusted.

Concerning the development of a clear communication mechanism amongst NAFO's subsidiary bodies, the E-WG considered that Rule 5.1 of the Commission's Rules of Procedures, which basically is the terms of reference for STACTIC, be amended to add a provision allowing STACTIC intersessionally to receive input from, or provide input to, the Scientific Council and/or any other NAFO subsidiary body, without having to go formally through the Commission. Since the Chair of STACTIC was unable to attend this meeting, the Secretariat offered to contact the Chair to see whether this proposal could address STACTIC's communication concerns [Subsequent to the meeting, the Secretariat contacted the Chair of STACTIC on this matter. The Chair, in principle, agreed with this proposal and it was agreed that the Secretariat, in consultation with the Chair of STACTIC, will present a proposal to STACTIC at the next Annual Meeting.] It was also mentioned that the respective terms of reference of all the Working Groups may need to be slightly amended to ensure such inter-communication.

The E-WG also briefly discussed whether CPs should consider reducing the number of Working Groups. In particular, it was mentioned that the remaining outstanding matters within the purview of the WG-CR or the WG-BDS could be subsumed under the other Working groups and their respective terms of reference of the remaining Working Groups could be amended accordingly.

The Chair of the WG-EAFFM raised concerns about the timely reporting of NAFO meetings this year. He mentioned in particular the long delay in producing the WG-ESA meeting report, which only was finalized just before the June SC meeting, that made it difficult for him, as co-Chair, to develop the agenda for his working group meeting. He recognized that this year there has been a lot of meetings to address the Greenland halibut issue, in particular for members of the SC, which has meant that there may not have been enough time between these meetings to produce final reports (and there was not enough time during these meetings to do the report at the meeting itself). However, he asked whether draft reports could be distributed more widely to alert CPs earlier about what had been discussed at these respective meetings.

7. Other matters

No other matters were raised.

8. Recommendations to forward to the Commission (COM)

The Working Group on Improving Efficiency of NAFO Working Group Process **recommends** the following:

- **Three (3) two-week periods be set aside every year for possible NAFO intersessional meetings, namely:**
 - a two-week period around the end of February and the beginning of March;
 - another two-week period around the end of April and the beginning of May, which would include the week for the traditional STACTIC intersessional meeting; and
 - a final two-week period that would alternate annually between the last two full weeks of July and the last two full weeks of August.

These two-week periods would not require meetings of NAFO subsidiary bodies to meet during those dates nor would they preclude the scheduling of meetings of NAFO subsidiary bodies outside those dates.

- **For the 2017-2018 NAFO year, the Working Group proposes the following periods, be considered for NAFO intersessional meetings:**
 - 26 February to 9 March 2018;
 - 30 April to 11 May 2018; and
 - 13 to 24 August 2018
- **Rule 5.1 of the NAFO Rules of Procedures: Commission be amended to add a provision allowing STACTIC intersessionally to receive input from, or provide input to, the Scientific Council and/or any other NAFO subsidiary body, without having to go formally through the Commission.**

The Secretariat, in consultation with the Chair of STACTIC, will present a proposal to STACTIC at the next Annual Meeting.

- **The Working Group on Improving Efficiency of NAFO Working Group Process continue its work for the 2017-2018 NAFO year under the same Terms of Reference.**

9. Adjournment

The meeting adjourned at 09:45 hours (Atlantic Daylight Time).

Annex 1. List of Participants

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Annex 2. Agenda

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2. Appointment of Rapporteur
3. Adoption of Agenda
4. Review schedule for upcoming Joint COM-SC Working Groups for 2017 (FC-SC WP 17-01 Rev. 2)
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6. Identify mechanisms to improve efficiencies, maximize meeting opportunities and share best practices
7. Other matters
8. Recommendations to forward to the Commission (COM)
9. Adjournment

Northwest Atlantic Fisheries Organization



**Report of the NAFO Commission Ad hoc Working Group to Reflect on the Rules
Governing Bycatches, Discards and Selectivity (WG-BDS)
in the NAFO Regulatory Area Meeting**

10 July 2017
Dartmouth, Nova Scotia, Canada

NAFO
Dartmouth, Nova Scotia, Canada
2017

**Report of the NAFO Commission Ad hoc Working Group to Reflect on the Rules
Governing Bycatches, Discards and Selectivity (WG-BDS)
in the NAFO Regulatory Area Meeting**

10 July 2017
Dartmouth, Nova Scotia, Canada

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Report of the NAFO Commission Ad hoc Working Group to Reflect on the Rules Governing Bycatches, Discards and Selectivity (WG-BDS) in the NAFO Regulatory Area

Dartmouth, Nova Scotia, Canada
10 July 2017

1. Opening by the Chair, Temur Tairov (Russian Federation)

The Chair opened the meeting at 10:00 hours on Monday, 10 July 2017 at the NAFO Headquarter in Dartmouth, Nova Scotia, Canada. He welcomed representatives from the following Contracting Parties (CPs) – Canada, Denmark (in respect of Faroe Islands and Greenland), the European Union and the United States of America. The Scientific Council was represented by its Chair, Kathy Sosebee. The presence of observers was also acknowledged (Annex 1).

2. Appointment of Rapporteur

The Senior Fisheries Management Coordinator of the NAFO Secretariat was appointed as rapporteur.

3. Adoption of Agenda

There was no substantive change in the previously circulated provisional agenda. As suggested by the Chair, the order of agenda items 6 and 7 was reversed (Annex 2).

4. Discussion of the bycatch analysis performed by Scientific Council and the Secretariat

Upon the recommendations of this Working Group (WG) from its August 2016 meeting, the Fisheries Commission during September 2016 Annual Meeting (Annex 14 of FC Doc. 16-20):

1. requested SC to examine relative levels of bycatch and discards of 3M cod/redfish, and stocks under moratoria in different circumstances (e.g. fisheries, area, season, fleet, depth, and timing) using the 2016 logbook (haul x haul¹) data, and
2. instructed the Secretariat to continue to analyze, for trends, patterns, anomalies:
 - in cases where bycatch thresholds² are exceeded or trends are apparent, the analysis should provide additional information on the associated catch weights for the specific stocks (3NO cod, 3M American plaice, 3LNO American plaice);
 - analysis should consider both historical and current CATs³ (2012 to current); and
 - trend in reported catch of non- Annex I.A species (3M witch flounder and 3M skate).

¹ Article 28.8.b of the NAFO Conservation and Enforcement Measures (NCEM) stipulates the recording and submission requirements of catches on a haul by haul (or tow or set) basis, or logbook information, of each fishing vessel.

² Threshold quantities are defined in Article 6 of the NCEM.

³ Article 28.6.c of the NCEM stipulates: every fishing vessel shall transmit electronically the quantity of catch retained and quantity discarded by species for the day, by Division, including nil catch returns, sent daily before 12:00 UTC. The daily catch report of the fishing vessel is identified as “CAT” in the NAFO Vessel Monitoring System.

Analysis of 2016 Logbook (Haul x haul) data

Due to time constraints during its June 2017 Meeting, SC was not able to conduct an analysis of the haul by haul data as requested by FC. Recognizing this, the Secretariat instead conducted analysis of the 2016 haul-by-haul data on for review by this WG. The presentation of the preliminary results is documented in Com-BDS-WP 17-03.

The analysis compared the numbers of fishing vessel/days in the haul by haul data with the equivalent data in CATs. In total, 82.5% of daily catch reports had corresponding haul by haul records. The Secretariat is working to resolve discrepancies between data sets and it is expected that some of the missing records will become available.

Catches of each species from daily catch reports and haul by haul data were presented. Overall, the haul by haul data are in the region of 80 to 93% of the totals from CATs as would be expected given the level missing data. However, there are a few cases where catches for individual flag stats are anomalously high or low.

Of the 32 272 records available, 15 66 (5%) lacked position information. The “end positions” reported for the remainder were plotted. Distribution of catches of each species by quarter were shown. Where available retained catches and discards by longline and bottom trawl are tabulated separately.

The main species (the most abundant species by weight) was determined for each haul. Catches from each stock, split by main species, were also tabulated and plotted in quarterly basis. For estimating the frequency of bycatch thresholds being exceed, the 2016 haul by haul data was used (see below)

Analysis of 2012-2016 of the daily catch reports (CATs)

As instructed, the Secretariat conducted the analyses of the 2012-2016 CATs for the detection of patterns, trends and anomalies. It was pointed out that a similar analysis was conducted the previous year using the 2012-2015 CAT data. The Secretariat also indicated that the latest analysis was previously presented at the STATIC Intersessional meeting in May 2017 (see agenda item 6.a). The presentation is documented in COM BDS-WP 17-002.

The CAT analysis confirmed the following characteristics that were revealed in the analysis conducted in the previous year:

- Cod in the Flemish Cap (Division 3M) represented the most predominant catch in any single division, followed by redfish,
- A major portion of the 3LMNO Greenland halibut catch comes from Division 3L,
- Redfish in a major species caught in all four Divisions. For 3LN Redfish, about 70% and 30% are caught in Divisions L and N, respectively. In Division 3O, it is the predominant species and skates is a distant second,
- Fish stocks 3NO skates and 3LNO yellowtail flounder are mostly caught in Division 3N.

With regards to bycatch:

- Skates and witch flounder are caught as bycatch in Division 3M (Flemish Cap),
- There was a remarkable reduction in the catch of grenadier for the period 2012-2016 and the latest grenadier catch was predominantly in Divisions 3LM,
- No trend was observed with regards to inter-annual variability of the bycatch.

With regards to estimating the frequency of hauls exceeding bycatch thresholds, the hauls of fish stocks 3LMNO Greenland halibut, 3M Cod, 3M Redfish, 3LN Redfish and 3LNO yellowtail flounder as “directed species” were examined against their associated bycatch of 3NO Cod, 3M American plaice and 3LNO American plaice. In all, 5348 hauls were examined. The frequency of occurrence is summarized in Table 1 below.

Table 1. Frequency of hauls where bycatch thresholds were exceeded in 2016. (Data Source: 2016 Logbook (haul x haul) Reports.)

	Bycatch		3NO Cod			3M PLA			3LNO PLA		
	Threshold		> of 1000 kg or 4%			> of 1250 kg or 5%			> of 1250 kg or 5%, 15% in YEL fishery		
Directed Fishery	# Hauls	Catch (t)	# Hauls	DF Catch (t)	Bycatch (t)	# Hauls	DF Catch (t)	Bycatch (t)	# Hauls	DF Catch (t)	Bycatch (t)
3LMNO GHL	1614	7009.3				0	0	0	18	63.0	10.1
3M COD	1129	10774.2				10	34.8	3.6			
3M RED	995	4993.5				3	8.2	0.6			
3LN RED	1052	5708	17	92.7	14.3				7	249.2	34.5
3LNO YEL	558	3796.6	30	191.3	21.4				28	155.2	49

Discussion

The presentation of the Haul x Haul and CAT analyses elicited comments and points for discussion, including suggestions for further analysis in support of the NAFO Action Plan being developed:

- Noting that there have been outstanding technical issues regarding the submission and formatting of some haul by haul reports, the Secretariat should examine further the available data to detect possible discrepancies between the Haul x Haul and CAT reports, including working with Contracting Parties (Fisheries Monitoring Centres) to resolve any data issues.
- The Secretariat noted the specific suggestions and several areas for further analysis:
 - Expand existing by-catch threshold analysis to include directed fisheries for 3LNO Thorny skate and 3O Redfish;
 - Mapping of occurrences where by-catch thresholds have been exceeded by species and time period (quarterly intervals);
 - Report of discards, including rejects, by species and division;
 - Five-year trend analysis by species and division based on CAT reports;
 - Maps of by-catch of moratoria species for directed species in which it is most frequently encountered.
- The NAFO Roadmap towards an Ecosystem Approach to Fisheries (SCS Doc. 16-14) and the finalized Action Plan (see agenda item 5) shall provide direction to the SC and the Secretariat in further bycatch analyses.
- The results of the analyses could be useful in informing STACTIC in its task of formulating and evaluating management and enforcement measures relating to bycatch, discards, and selectivity.

5. Action Plan in the Management and Minimization of Bycatch and Discards

Recommendation 1 from WG-BDS meeting in August 2016 (FC Doc. 16-05) pertains to the Action Plan:

- ***the continuation of the Working Group to further develop and finalize the Action Plan in time of the 2017 NAFO Annual Meeting.***

The Working Group continued to work on the draft action. Due to time constraints, the draft was not finalized at this meeting. Further input was sought after the meeting. Annex 3 shows the status of the draft in which the

input from CPs are reflected but has not yet been discussed by the WG. It was agreed to forward a recommendation with the aim to finalize the draft at the 2017 Annual Meeting (see agenda item 7).

6. Other Matters

a. STACTIC Intersessional Meeting, May 2017

The Secretariat informed that it presented the preliminary results of its threshold and patterns analyses at the STACTIC Meeting in May 2017 (FC Doc. 17-02). The presentation engendered discussions about the challenges with complying with bycatch rules outlined in Article 6 of the NCEM where domestic discard bans exist. STACTIC expects an updated presentation following input from this Working Group (see agenda item 4).

b. WG-CR/CDAG Meeting, February and May 2017

The Secretariat clarified that WG-CR met face-to-face in February 2017 (FC-SC Doc. 17-01) and that there were two follow-up meetings jointly with CDAG via Web-Ex in April and May 2017.

The SC Chair (concurrently the co-Chair of the WG-CR) Kathy Sosebee informed the Working Group that the *Catch Estimation Strategy* developed by the Catch Data Advisory Group was applied successfully in estimating Greenland halibut catches in the NAFO Regulatory Area. In addition, the method was also applied to stocks for which a full assessment was conducted by SC in June 2017. The WG-CR/CDAG will meet again in August 2017 to compare 2014 Greenland halibut catch estimates using this method with previous estimates, to consider haul by haul as part of the *Strategy* and to evaluate the usefulness of applying the *Strategy* to other managed stocks in the NAFO Regulatory Area. The recommendations to be forwarded to the Commission and SC will also be finalized at the August 2107 meeting.

c. NAFO Working Group on Improving Efficiency of NAFO Working Group Process

The NAFO Executive Secretary reported on the progress of this Working Group which comprises the Chairs of the NAFO bodies and other Working Groups:

1. a proposal will be forwarded at the Annual Meeting setting aside three 2-week periods as windows for Working Groups to meet intersessional – in February-March, in April-May, and alternating in late July or late August;
2. a proposal to revise the Rules of Procedure to streamline the communication mechanism of STACTIC with other bodies; and
3. a proposal that this Working Group would continue for another year in order to discuss the consolidation of Terms of References of the NAFO Working Groups.

7. Recommendation to forward to the Commission

The Working Group recommends that:

- the Commission requests the Contracting Parties to finalize the draft Action Plan in the Management and Minimization of Bycatch and Discards (see Annex 3) during the 2017 NAFO Annual Meeting.

8. Adoption of Report

The report was adopted via correspondence.

9. Adjournment

The meeting was adjourned at 17:00 hours on 10 July 2017.

Annex 1. List of Participants

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Annex 2. Agenda

1. Opening by the Chair, Temur Tairov (Russian Federation)
2. Appointment of Rapporteur
3. Adoption of Agenda
4. Discussion of the bycatch analysis performed by Scientific Council and the Secretariat
5. Action Plan in the Management and Minimization of Bycatch and Discards
6. Other Matters
 - a. STACTIC Intersessional Meeting, May 2017
 - b. WG-CR/CDAG Meeting, February and May 2017
 - c. NAFO Working Group on Improving Efficiency of NAFO Working Group Process
7. Recommendations to forward to the Commission
8. Adoption of Report
9. Adjournment

Annex 3. Draft Action Plan in the Management and Minimization of Bycatch and Discards

(COM BDS-WP 17-01 Rev. 2)

This Action Plan builds on the version adopted by the NAFO Fisheries Commission (FC) in September 2015¹. The Action Plan below, if adopted, will conclude the ~~regular work~~ initial objective of the ad-hoc NAFO WG on By-catch, Discards and Selectivity (WG-BDS). However, the FC may re-convene WG-BDS ad-hoc, as if required to support implementation of the Action Plan; ~~WG-BDS will also be required to step in for actions under section 4 of the action plan.~~

The scope of the Action Plan would include:

- Stocks included in Annexes I.A and I.B NCEM and other stocks identified by the Working Group (e.g. 3M Witch flounder, 3M Thorny skate).
- All associated catch of marine mammals, sea birds and sea turtles.

The Action Plan will ensure that there is a systematic and horizontal consideration of the overarching objectives set out below across NAFO bodies, at least up to 2021. NAFO bodies identified will take the lead for each of the specified actions, but are expected to involve other bodies and coordinate with them regularly (see section 7 of interim report of the WG on Improving Efficiency of NAFO WG Process of 28 October 2016).

The Action Plan will require support from the NAFO Secretariat ~~the use of cost-effective and efficient IT tools in order for to support~~ the analysis of by-catch data, notably haul-by-haul data.

A. Overarching objectives

1. Effective management and the minimization of by-catch and discards, and improvement of selectivity, in fisheries of the NRA.
2. Accurate reporting of target, non-target and incidental catch.
3. Account for total catch (retained and non-retained) in scientific assessments and management measures.
4. Management measures are adaptive and address changing fishery conditions over time, or differences among areas and fleets.
5. Management measures reflect the precautionary and ecosystem approaches to fisheries management.
6. Identify priority areas for fisheries for by-catch management, in particular areas where there is a risk of causing serious harm to by-catch species.
7. Ensure linkage to other NAFO bodies doing work related to by-catch management (e.g. STACTIC, WG-EAFFM, WG-ESA, WG-CR).

Commented [IR(1): At this stage, the EU prefers to focus on the regulated stocks only.

Commented [D2]: This is outside the scope of the NAFO Convention

Commented [IR(3): Level of by-catches might be more relevant for fisheries than areas.

¹ FC Doc. 15-22 Rev (Annex 13 to the Fisheries Commission report on the 37th NAFO Annual Meeting in 2015).

B. Actions, actors, timing

1. Data management

What	Expected result	NAFO body	Timeline
1.1. Standard formats, data collection and data transmission	Ensure that all forms and data used to report catch and effort are standardized according to existing NCEM provisions, including observer data. If appropriate, consider results of the study on catch data collection methodologies whose ToR were endorsed by the SC 2016.	SC Secretariat/STACTIC	AM 2019
1.2. Logbook data	Haul-by-haul data is available for NAFO bodies, with relevant breakdown for <u>catches by species</u> , retained and non-retained.	SC Secretariat	AM 2019
1.3. Data completeness and identification of gaps	Identify gaps in information on by-catch, whether retained or not retained, i.e. is NAFO (1) capturing all the information it needs to assess by-catch, selectivity and discards and (2) are NCEM rules on reporting of by-catch being complied with?	SC Secretariat	AM 2019
1.4. Data sharing	Improve information sharing with other international bodies (e.g. NEAFC, ongoing) and sharing exchange best practices related to by-catch discards and selectivity among between NAFO and Contracting Parties.	STACTIC	AM 2019

Commented [D4]: If compliance with existing measures, this is a role for Secretariat
If requirement to standardize reporting, this is a role for STACTIC

Commented [D5]: Premature given the details have not yet been finalized and the study not yet approved. It would be more appropriate to consider as an update to the plan if later deemed appropriate (after details have been finalized).

Commented [IR(6)]: The Study is in the process of being finalized and the wording refers to "if appropriate" and "consider", therefore the current wording already provides a "safety net".

Commented [D7]: In conjunction with FMCs

2. Ongoing analysis and monitoring

What	Expected result	NAFO body	Timeline
2.1. Trends, patterns and anomalies	<p>A a) <u>Annual mapping of by-catch in NAFO from 2016 forward using haul by haul data</u></p> <p>b) <u>Secretariat to continue to analyze trends, patterns anomalies in reported catch of identified non Annex 1a and Annex 1b species (3M Witch flounder, 3M Thorny Skate) in the last 5 years which is possibly to be updated every year afterwards (ideally, an IT tool that can receive, integrate and analyze new data inputs).</u></p>	SC Secretariat	AM 2020
2.2. Specific issues by time, area, depth, fleet and fishery	<p>Specific issues identified as part of the work under 2.1.</p> <p><u>Specific need for Secretariat to compile data on discards in the NRA</u></p> <p><u>Identification of regulatory, technical and economic constraints which prevent the elimination of discards in NAFO.</u></p> <p>Identification of species under NAFO catch or effort limits with high survivability rates.</p>	Secretariat SC	AM 2020
2.3. Identification of best practices	On the basis of actions 2.1 and 2.2, tentative guidelines on best practices to avoid by-catch per time, area, depth, fleet and fishery.	BDS SC	AM 2020

Commented [IR(8): We would prefer to focus on regulated stocks

Commented [D9]: Need to identify scope of the problem first

Commented [D10]: Perhaps move to Section 4 under management options for consideration by BDS and SC

3. Identification of priorities

What	Expected result	NAFO body	Timeline
3.1. Moratoria species	Consider priority moratoria species which should recover quickly and identify moratoria stocks where the level of bycatch/discards may be impeding recovery are prevented from doing so by excessive by catch and/or discards	WG EAFM SC (with BDS)	AM 2021
3.2. Areas where there is a risk of causing serious harm to by-catch species	Identify Consider priority areas, times and fisheries where by-catch and discards, notably of moratoria species, that have a higher rate of occurrence, are more harmful, notably to moratoria species under 3.1. Survivability of NAFO species should be considered (see task 2.2). Risk assessment procedures should be developed in order to help prioritize areas.	SC (with BDS) WG EAFM	AM 2021
3.3. High rates of discards	Identify the species with the highest rate of discards in the NRA Establish criteria to rank NAFO fisheries according to its discard rates. Those criteria could include, among others, discard tonnage and discard value.	Secretariat WG EAFM	AM 2021

Commented [D11]: WG has already identified priority stocks

Commented [D12]: Seems to fit better in Section 2

4. Development of management options

What	Expected result	NAFO body	Timeline
4.1. Time-area management	For NAFO fisheries identified as priorities under Action group 3, assess the need for time-area management measures and/or new move-on rules.	WG-BDS STACTIC	AM 2021
4.2. Fishery-specific solutions	For NAFO fisheries identified as priorities under Action group 3, assess the need for specific solutions per fishery, including the development and assessment, with the Scientific Council, of selectivity tests.	WG-BDS STACTIC SC	AM 2021
4.3. Incentives to avoid by catch and discards	For NAFO fisheries identified as priorities under Action group 3, assess the feasibility of incentives to avoid by catch and discards.	WG-BDS	AM 2021

Commented [D13]: Incentive is that you must stay within conservation limits.

Commented [IR(14): Could leave it in, for example in the EU, vessels that practice more "selective" fishing could be allocated higher quotas. Other potential incentives might be considered, wording is non-committal.

3. Review

No later than 2022, this Action Plan should be reviewed and assessed, if appropriate by including it expressly in the scope of a NAFO Performance Review.

Northwest Atlantic Fisheries Organization



**Report of the NAFO Joint Commission-Scientific Council Working Group on
Risk-Based Management Strategies (WG-RBMS) Meeting**

11-13 July 2017
Dartmouth, Nova Scotia, Canada

NAFO
Dartmouth, Nova Scotia, Canada
2017

Report of the NAFO Joint Commission-Scientific Council Working Group on Risk-Based Management Strategies (WG-RBMS) Meeting

11-13 July 2017
Dartmouth, Nova Scotia, Canada

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Report of the NAFO Joint Commission-Scientific Council Working Group on Risk-Based Management Strategies (WG-RBMS) Meeting

11-13 July 2017
Dartmouth, Nova Scotia, Canada

1. Opening by the co-Chairs, Jacqueline Perry (Canada) and Carsten Hvingel (Norway)

The meeting was opened at 10:10 hours on 11 July 2017 at the NAFO Headquarters in Dartmouth, Nova Scotia, Canada. The co-Chairs, Jacqueline Perry (Canada) and Carsten Hvingel (Norway), welcomed representatives from Canada, Denmark (in respect of Faroe Islands and Greenland), European Union, Japan, Russian Federation and United States of America. The presence of an observer from the Ecology Action Centre was acknowledged (Annex 1).

Japan made an opening statement expressing its sincere appreciation of the hard work of this Working Group (WG) and of the Scientific Council (SC) particularly on the Greenland halibut Management Strategy Evaluation (GHL- MSE).

Co-Chair, Carsten Hvingel, reported on the status of the GHL-MSE work being undertaken in relation to the adopted workplan. He referred to the previous meetings of this WG and of the SC this year. The selections of management objectives, performance statistics, and operating models have been completed. Candidate Harvest Control Rules (HCRs) have been identified. He also reminded WG that in accordance with the timeline agreed at the London meeting in February 2017, the WG is expected at this meeting to: review initial Candidate Management Procedures and/or Harvest Control results, finalize objectives and their quantification and advise direction for further Candidate Management Procedure and/or HCR development.

2. Appointment of Rapporteur

The Senior Fisheries Management Coordinator and Scientific Council Coordinator (NAFO Secretariat) were appointed co-Rapporteurs of this meeting.

3. Adoption of Agenda

The co-Chairs indicated this meeting would focus on the GHL-MSE. The provisional agenda previously circulated was adopted without any changes (Annex 2).

4. Review of the report from the WG-RBMS Meeting, 25-27 April 2017

Kathy Sosebee (SC Chair), the presiding Chair of the April 2017 meeting, presented the meeting report (FC-SC Doc. 17-03). Highlights of the meeting, as reflected in the report, include:

- a presentation of a generalized form of target-based HCR, in addition to the existing slope-based HCR, which served as a basis for further development of a suite of Candidate Management Procedures (CMPs),
- progress towards the finalization of management objectives and their corresponding performance targets and associated performance statistics (PS), as well as the identification of “required” and “desirable” targets (Tables 1 and 2 of FC-SC Doc. 17-03),
- specific steps in a paring down exercise to limit the number of CMPs, e.g. determination of the reference set of Operating Models (OMs) and tuning CMPs to a specified criterion.

5. Greenland Halibut Management Strategy Evaluation (GHL-MSE) and other related matters arising from the Scientific Council Meeting, 01-15 June 2017

There were discussions about the great difficulties the SC has encountered due to its heavy agenda and the demanding work on the Greenland halibut MSE. The busy schedules of meeting both the SC and the different WGs did not allow the final reports of the meetings to be finalized in time, making deliberations and decision-making difficult.

Due to the short time between the SC June meeting and this meeting, the SC meeting report was not available to this WG for discussion. Instead, Brian Healey (SC vice-Chair) gave a presentation outlining the progress of SC on the GHL-MSE work. In accordance with the GHL-MSE timeline developed in London, UK in February 2017, SC had the following agenda items to address at the June meeting:

- Tabling of developers (SCAA and SSM) results
- Review of operating model fits
- Review of initial CMPs results
- Initial discussion on trial plausibility
- Possibly add further trials and then finalize operating models and trials
- Cull initial CMPs to a smaller set and summarize results.

Work on the above was initiated with the exception of discussion on trial plausibility. Considerations in conducting the MSE trials were related to, among others, target- and slope-based HCRs, alpha and gamma parameters, weighting of the different surveys used in the assessment, number of years (3) to average for composite stock size index, starting TAC, a 30% over-catch scenario, and maximum inter-annual TAC changes of 10% and 20%.

SC agreed that the following elements would be included in future Candidate Management Procedures trials:

- Target based procedure ($TAC_{y+1} = TAC_y (1 + \gamma_{up/down}(J_y - 1))$)
- Test $\gamma = c(0.5, 1)$
- Previous slope based rule would also be tested in as comparative a manner as possible with survey weighting.
Points were raised in discussion of the above related to the variance estimates for J, and that some surveys are better monitors of certain age ranges (generally younger) given the depth of those surveys. It was noted that there was very little difference in performance statistics between inverse variance and equal weighting of surveys, and a decision to keep inverse variance weighting had been made.
- Number of years to average for composite stock size index: the agreed decision was 3
- Starting TAC in 2018 to initiate HCR: 15000 and 20000 t.
- Alpha parameter: tuned to baseline (median exploitable (5-9) biomass in 2037 = B_{msy}), and an alternative (tuned to overcatch scenario 30%, med B (5-9)= B_{msy} in 2037)
- Max interannual TAC change: 10% and 20%

Table 1 below summarizes the operating model variants that were agreed upon as basis for MSE trials going forward.

Table 1. Operating Model variants as basis for MSE trials going forward.

Retained Operating models (shown after the first entry as variants to baseline)	SSM	SCAA
Baseline: uses data including 2016 and the 03 set of surveys	X	X
Hockey-stick with flex point at 25% quantile of SSB (or as reasonably approximated)	X	X
Post-hoc fitting of Beverton Holt curve, with $h = 0.8$.	X	
Continue development of internally fitted stock recruitment model	X	
Recruitment for the first 8 years at 0.5 of the level predicted by the recruitment method (mean recruitment or SR function)	X	X
Larger recruitment variability $\sigma_R=0.6$	X	X
SSM future dynamics, and with SSM numbers-at-age		X
Senescence: increase natural mortality from 0.12 to 0.5 in 10+	X	X
Future catches =130% TAC	X	X

Additional variants discussed by SC but not included in the above table included an option for zero selectivity in the plus group.

Following the SC June 2017 meeting, issues were discovered in the computer code used to produce some of the SCAA results considered at that meeting. Consequently, some SC members have expressed concerns that decisions taken by the SC regarding the selection of trials to go forward may have been unsound. Due to the short time interval between the SC June meeting and the present meeting, it had not been yet possible to assess the potential implications of the corrected model fully. This analysis will be performed by the model developers after this meeting and any decisions made at the present meeting are conditional upon the SC receiving adequate demonstration that the model results have not significantly altered the basis for OMs or CMP selection.

SCAA operating model

Japan (Doug Butterworth) presented the results of the trials agreed at the June SC meeting using the SCAA based suite of operating models. Results are presented in COM-SC RBMS-WP 17-11. At the request of the WG, further trials were run with the number of survey series used by the HCRs increased from three to five (COM-SC RBMS-WP 17-12). A broader range of trials was explored, e.g. additional runs were requested and presented including a variation of starting TAC (15 000t and 17 500t); time to B_{msy} (ie 2030); and varying Δ (5, 7.5 and 15%). Additional trials were requested and ran for the target based model with $\gamma=0.5$ and $\gamma=1.0$ and for the slope based model with $\Delta=0.1$, 2018 TAC=17 500t (COM-SC RBMS-WP 17-14).

SSM operating model

Canada (Christoph Konrad) presented preliminary results of operating models based on the SAM style model (SSM). Operating model variants trialed included the base case, hockey stick recruitment, Beverton-Holt recruitment, catches of 130%TAC, plus-group senescence, low recruitment (under constant recruitment and Beverton Holt recruitment), and no fishing on the plus group. At present, only a limited number of CMPs have been trialed so that further work will be required before the September 2017 meeting.

The operating model failed to converge (ie, had not attained stability after numerous iterations) for some of the tests (e.g. those with high recruitment variability); the reason for this is not currently understood. Furthermore, some of the tests produced results that were different from equivalent tests performed during

the June SC meeting. The model developers will work together before September to understand and resolve these problems.

Next Steps

Decisions concerning next steps were based mainly on the results of the SCAA because the SMM results were considered preliminary.

It was agreed that both target and slope based HCRs should remain under consideration (see Annex 3). It was also agreed to use the O3 set of surveys as the basis for computing TACs in both HCRs (see Annex 4). Candidate HCRs will be developed based on the following agreed upon parameters for future testing for both SCAA and SSM operating models. Each of the variants will be applied as an individual variation on the base HCR. Additional runs incorporating two or more variations may be tested in combination.

Target based rule:

- Tuning: for OM1, $med B_{(5-9)} = B_{msy}$ by 2037
- $\gamma = 0.15$
- $\Delta = 0.1$
- Starting TAC of 17 500t and 15 000t

Slope based rule:

- $\Delta = 0.1$
- $\lambda_{up} = 1.0, \lambda_{down} = 2.0$ or 1.25
- Tuning: for OM1, $med B_{(5-9)} = B_{msy}$ by 2037
- Starting TAC of 17 500 t and 15 000 t

An additional CMP with catch = 0 would be included to indicate the bound on the extent of recovery possible.

It was further noted that starting TAC eventually selected may lie within the range of 15 000 and 17 500 t rather than be one of those two explicit values.

It was acknowledged that there may be a need to revisit these parameters in the event that performance targets cannot be achieved under these circumstances within the SSM suite of OMs.

The SCAA-based results had used the same random number seed for runs for different CMPs for a given OM to provide results that were comparable in relative terms. It was agreed that the final trials should be ran for more than 100 replicates to achieve better precision of results in absolute terms.

Output Figures should include ones of the same form as be the same as Figure 1 in COM-SC RBMS- WP 17-16 with the addition of a plot for the probability that $B_{2022}^{5-9} < B_{2018}^{5-9}$.

It was noted that OMs including 30% TAC overharvest resulted in very low biomass in the SCAA trials, and the WG discussed whether such a high level of overharvesting would be plausible in the context of current management and surveillance. It was agreed that future runs should instead include an overharvest scenario of 10% which is considered to be more realistic. It was noted that the exceptional circumstances protocol, which will be developed following the adoption of the agreed management procedure, could be used to address possible situations in which higher levels of overharvest are known to be occurring.

Consultants for SCAA and SSM were requested to make the results of the MSE runs available at least one week prior to the next meeting. OM considerations for the MSE trials are summarized in Table 2.

Table 2. Operating Models for further review.

Retained Operating models (shown after the first entry as variants to baseline)	SSM	SCAA
Baseline: uses data including 2016 and the O3 set of surveys	X	X
Recruitment for the first 8 years at 0.5 of the level predicted by the recruitment method (mean recruitment or SR function)	X	X
Larger recruitment variability $e_{rt}=0.6$	X	X
Zero selectivity for the + group	X	X
Future catches =110% TAC	X	X
Operating models still required for validation of the SSM model.		
Hockey-stick with flex point at 25% quantile of SSB (or as reasonably approximated)	X	
Post-hoc fitting of Beverton Holt curve, with $h = 0.8$.	X	
Continue development of internally fitted stock recruitment model	X	
SSM future dynamics, and with SSM numbers-at-age		
Senescence: increase natural mortality from 0.12 to 0.5 in 10+	X	

6. Recommendations to forward to the Commission and Scientific Council

This agenda item was deferred to the next Working Group meeting.

7. Other Matters

The WG noted SC's indication that the assessment of Greenland halibut will be completed during the first day of the NAFO Annual Meeting in September 2017.

It was decided to have another meeting on 15-16 September 2017 in Montréal, Québec, Canada to finalize the GHL-MSE, i.e. the selection of the Management Procedure, which will be forwarded to the Commission with a recommendation for adoption.

8. Adoption of Report

The report was adopted via correspondence.

9. Adjournment

The meeting was adjourned the meeting at 18:00 hours on 13 July 2017.

Annex 1. List of Participants

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Annex 2. Agenda

1. Opening by the co-Chairs, Jacqueline Perry (Canada) and Carsten Hvingel (Norway)
2. Appointment of Rapporteur
3. Adoption of Agenda
4. Review of the report from the WG-RBMS Meeting, 25-27 April 2017
5. Greenland Halibut Management Strategy Evaluation (GHL-MSE) and other related matters arising from the Scientific Council Meeting, 01-15 June 2017
6. Recommendations to forward to the Commission and Scientific Council
7. Other Matters
8. Adoption of Report
9. Adjournment

Annex 3. Formulation of candidate management plans

Target based CMPs:

$$TAC_{y+1} = TAC_y \left(1 + \gamma_{up/down} (J_y - 1) \right) \quad (1)$$

where

TAC_y is the TAC recommended for year y ,

γ_{up} and γ_{down} are “response strength” tuning parameters (γ_{down} if $J_y < 1$ and γ_{up} if $J_y \geq 1$), and

J_y is a composite measure of the immediate past level in the abundance indices that are available to use for calculations for year y ; for this base case CMP three series have been used, with $i = 1, 2$ and 3 corresponding respectively to Canada Fall 2J3K, EU 3M 0-1400m and Canada Spring 3LNO:

$$J_y = \sum_{i=1}^3 \frac{1}{(\sigma^i)^2} \frac{J_{curr}^i}{J_{target}^i} / \sum_{i=1}^3 \frac{1}{(\sigma^i)^2} \quad (2)$$

with

$(\sigma^i)^2$ being the estimated variance for index i (estimated in the model fitting procedure for OM1)

$$J_{curr}^i = \frac{1}{q} \sum_{y'=y-q}^{y-1} I_{y'}^i \quad (3)$$

$$J_{target}^i = \alpha \frac{1}{5} \sum_{y'=2011}^{2015} I_{y'}^i \quad (\text{where } \alpha \text{ is a control/tuning parameter of the CMP}) \quad (4)$$

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 though they will be for the preceding year $y-1$.

Constraints on the maximum allowable annual change in TAC can be applied, viz.:

$$\text{if } TAC_{y+1} > TAC_y (1 + \Delta_{up}) \text{ then } TAC_{y+1} = TAC_y (1 + \Delta_{up}) \quad (5)$$

and

$$\text{if } TAC_{y+1} < TAC_y (1 - \Delta_{down}) \text{ then } TAC_{y+1} = TAC_y (1 - \Delta_{down}) \quad (6)$$

Slope-based CMPs:

$$TAC_{y+1} = TAC_y (1 + \lambda s_y) \quad (7)$$

where

$\lambda = 1.0$ if $s_y > 0$ and $\lambda = 2.0$ if $s_y < 0$, and

s_y is a measure of the recent (over the five most recent years) trend in survey biomass, taken as the unweighted arithmetic average over the three surveys.

Annex 4. Survey data sets

Table 1. Data sets agreed by SC April 2017 meeting (NAFO SCS Doc. 17-15) to be considered for use in operating models. The O3 set will be used as the basis for computation of TACs in all CMPs.

	Base	O1	O2	O3
Fall 2J3K	1996-2015	1996-2015	1996-2015	1996-2015
Spring 3LNO	1996-2014	1996-2014	1996-2014	1996-2014
EU 3M 0-700	1995-2003	1995-2015	1995-2015	1995-2003
EU 3M 0-1400	2004-2015			2004-2015
EU 3M 700-1400		2004-2015	2004-2015	
EU Spain 3L		2006-2015		
EU Spain 3NO		1997-2015	1997-2015	1997-2015
Fall 3LNO		1996-2015	1996-2015	1996-2015

Northwest Atlantic Fisheries Organization



**Report of the NAFO Joint Commission-Scientific Council Working Group on
Ecosystem Approach Framework to Fisheries Management (WG-EAFFM) Meeting**

14 July 2017
Dartmouth, Nova Scotia, Canada

NAFO
Dartmouth, Nova Scotia, Canada
2017

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14 July 2017
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1. Opening by the co-Chairs, Robert Day (Canada) and Andrew Kenny (EU)

Andrew Kenny (EU) opened the meeting at 09:15 hours on Friday, 14 July 2017 at the NAFO Headquarters in Dartmouth, Nova Scotia, Canada.

The presiding Chair welcomed representatives from the following Contracting Parties (CPs) – Canada, European Union, Iceland, Norway, Russian Federation, and United States of America. Two delegates participated via teleconference WebEx. The presence of observers was also acknowledged (Annex 1). He informed the Working Group (WG) that co-Chair Robert Day apologized for his absence and that he (Robert Day) could no longer serve as co-Chair due to other commitments.

2. Appointment of Rapporteur

The Senior Fisheries Management Coordinator and Scientific Council Coordinator and (NAFO Secretariat) were appointed co-Rapporteurs of this meeting.

3. Adoption of Agenda

The previously circulated provisional agenda was adopted with one addition. Canada requested the opportunity to provide an informational presentation regarding its domestic marine conservation targets. This was inserted as agenda item 7.a (Annex 2).

4. SC response to FC requests for advice:

a. Consideration of 2014 SC advice regarding extent of the New England and Corner Rise Seamounts (Annex 13 of FC Doc. 16-20)

At the 2016 Annual Meeting, the Fisheries Commission requested the WG consider the 2014 SC advice and “develop recommendations to the FC, as appropriate, on amendment to the current polygons for those seamounts, pursuant to that advice, as well as any additional management advice necessary for their protection, as appropriate.” (FC Doc. 16-20).

The 2014 SC advice is: *The polygons of the closures for both the New England and Corner Rise seamounts be revised to the north, east and west in the NAFO Convention Area to include all the peaks that are shallower than 2000 meters (as shown in Figure 15 of the SC 2014 Report).* Figure 1.5.4 of SCS Doc. 16-21 shows a polygon encompassing the seamounts of the NAFO Regulatory Area belonging to the New England complex and outside of the current NAFO seamount closure (Annex 3).

There was general agreement that the peaks shallower than 2000 metres must be protected. However, it was noted by several WG participants that the possible extension to the New England Seamount closure suggested as depicted by SC WG-ESA in 2016 (Figure 1.5.4 of SCS Doc. 16-21, Annex 3) includes very large areas of abyssal plain in addition to the seamounts. The necessity of having such large areas of ocean floor at unfishable depths closed to bottom fishing activities was questioned. It was agreed that SC should be requested to provide advice on possible revised boundaries for the protection of seamounts.

No agreement was reached on the timing to establish a more suitable (fit-for-purpose) boundaries for the New England seamount closure.

The EU expressed that “it was always keen to act on the VMEs and seamounts protection when all scientific data was clear and sound and the objectives behind any measures were clear. For the time being, on this particular point, more work needs to be done on first clarifying the exact boundaries of the area that would need to be closed. In addition, there is no urgency of acting in this case, as there is currently no fishing activity in the area. Instead, this discussion would be better placed in the wider context of the upcoming review of the closures policy to take place in 2020. This would enable a deeper reflection on how to better achieve our objectives and have a fit for purpose policy that is consistent across the field and takes into account the latest available science, instead of continuing the practice of incremental “ad-hoc” actions”.

The USA and Iceland noted that the WG should provide advice on refinements to the closure in 2017.

An agreed recommendation was drafted with respect to the New England sea mounts occurring at depths of less than 2000 metres and falling outside of the current closure. (see agenda item 6).

b. Risk assessment of scientific surveys impact on VME in closed areas (2016 FC Request to SC #3)

The WG endorses the 2017 SC advice that scientific bottom trawl surveys in existing closed areas be avoided if possible and additional work be conducted as soon as possible to further evaluate the implications of excluding RV surveys in closed areas on stock assessment metrics. No specific recommendation was drafted.

5. Discussion of ongoing matters:

a. Assessment of NAFO bottom fisheries SAI (2016 FC Request to SC # 6)

The presiding Chair (as member of SC) reported that in 2016 and 2017, SC made further progress on assessing the overlap of NAFO fisheries with VME based on daily catch reports. Work to address other parts of this request will be conducted in 2018, noting that progress can only be achieved with appropriate participation of experts.

The analysis in 2016 focused on methods to potentially evaluate the recovery potential and functional significance of sea pen VME. In addition, a review of the functional significance of other VME species (including sea pen) was initiated.

The activities are funded by EU NEREIDA and are not yet finalized. The EU however indicated that it is actively considering ways of expanding the NEREIDA funding for one more year. Noting that the EU survey encompasses a large area and analysis would take time to complete, Canada had offered to support the analysis.

b. Progress of analysis undertaken by EU NEREIDA funded research project

See agenda item 5.a above.

c. Update on identification and mapping of sensitive species and habitats in the NAFO area

The presiding Chair (as member of SC) provided an up-date on VME biomass records from Spanish trawl surveys in 2016 and Canadian trawl surveys in 2015. It was noted that the VME polygon analysis using Kernel Density Estimation (KDE) analysis conducted in 2014 will be up-dated to include all the recent data from 2014 – 2017 surveys. The results of the updated VME KDE polygon analysis will be assessed at WG-ESA in 2017 and both support of the 2018 reassessment of ‘sea pen’ closed Area 14 and the more extensive review of closed Areas in 2020. Canadian research in situ photographic surveys in the NAFO Regulatory Area conducted in 2015 and 2016 demonstrate the utility of photographic techniques in quantifying VME species abundance under different habitat conditions. The includes the impacts of fishing which was noted to be particularly important in further quantifying the functional criteria required in support of assessing SAI and the reassessment of bottom fisheries in 2021. New survey data from the New England ‘Kelvin’ seamount lying

outside of the current closure shows an abundance of VME indicator species, notably large gorgonians and associated epifauna (see agenda item 4.a).

d. Further development and application of the Ecosystems Approach to Fisheries (EAF) Roadmap, including further consideration of any issues raised at the Scientific Council Meeting, 01-15 June 2017

Dr. Pierre Pepin, as member of SC, presented the work undertaken by SC WG-Ecosystem Science and Assessment (WG-ESA) in November 2016 and reviewed by SC in June 2017. Important developments included significant development of Ecosystem summary sheets and further improvements to the models of Fisheries Productivity Potential and the NAFO roadmap. No specific recommendation arose out of this work in 2017 and work will continue. Details on this work can be found in the WG-ESA 2016 meeting report (SCS Doc. 16-14). It was pointed out that implementation of the NAFO Roadmap will require Contracting Parties to identify and commit additional human resources. The scientists in the WG were urged to be more pro-active in “recruiting” fellow scientists to be actively involved in the implementation of the Roadmap.

In his presentation, Dr. Pepin drew attention to changes in survey biomass levels for many of the species sampled in Canadian surveys of the Newfoundland Shelf and Grand Bank. In particular, the total biomass in the fall 3LNO survey has fallen 40% from the 2010-2013 level. This has coincided with a change in plankton species composition and in environmental drivers, and may indicate a change in the productivity of the system.

e. Alfonsino fishery on seamounts in the NAFO Regulatory Area.

The WG noted the SC advice on alfonsino fishery on seamounts as documented in 2013 and 2015 SC Reports and the discussions at the FC in 2015 and 2016 (FC Doc. 15-23 and FC Doc. 16-20) regarding possible management measures.

The SC Chair Kathy Sosebee informed that alfonsino stock in the NAFO Regulatory Area was monitored at its June 2017 meeting. SC concluded that there is no reason to revise scientific advice provided earlier. The WG noted that establishing conservation and enforcement measure for the alfonsino fishery management is beyond the mandate of this Working Group. It agreed that this issue would be more appropriate for discussion by the Commission.

6. Recommendations to forward to the Commission and Scientific Council

Consideration of 2014 SC advice regarding extent of the New England and Corner Rise Seamounts (Annex 13 of FC Doc. 16-20)

The WG-EAFFM recommends that:

- **Scientific Council in its September meeting should develop revised closed area boundaries for potential closures encompassing all seamounts at depth less than 2000m in the New England seamount chain, taking into account that the current proposed boundary includes large areas that do not contain seamounts. The Commission should consider the timing and strategic objective of these closures in the context of the scheduled review of closures in 2020.**

7. Other Matters

a. Presentation: *Canada's Marine Conservation targets for 2017 and 2020: The Role of Fisheries*

For information purposes, Brett Gilchrist of Fisheries and Oceans Canada, made a presentation on Canada's domestic commitments and actions in attaining the UN Sustainable Development Goal 14 and Convention of Biological Diversity Aichi Target 11. A copy of the presentation is included as Annex 4.

b. NAFO Working Group on Improving Efficiency of NAFO Working Group Process

The NAFO Executive Secretary reported on the progress of the WG which comprises the Chairs of the NAFO bodies and other Working Groups.

The Secretariat will forward proposals to the Commission at the Annual Meeting for consideration:

setting aside three (3) two-week periods as windows for Working Groups to meet intersessionally – in February-March, in April-May, and alternating in late July or early August,

revising the Rules of Procedure to streamline the communication mechanism of STACTIC with other bodies,

that this Working Group would continue for another year in order to evaluate the possible consolidation of Terms of Reference of the NAFO Working Groups.

c. Recommendation for a new co-Chair

The WG agreed to recommend Elizabethann English (USA) to replace Robert Day (Canada) as co-Chair.

d. Timely availability of meeting reports

USA expressed its frustration that the SC WG-ESA November 2016 Meeting Report was not available in timely manner. This led to the inadequate time for the delegations to absorb the report and to have internal discussions and consultations on the results of the SC WG-ESA meeting in advance of this meeting. While agreeing that it is regrettable that the WG-ESA report was delayed, some scientists pointed out that this WG is tasked to review the work of SC rather than WG-ESA, and it is therefore the report of the SC June meeting rather than the WG-ESA report that should be the basis for discussion. All concerned were urged to be mindful about the timely finalization and availability of meeting reports.

8. Adoption of Report

The report was adopted via correspondence.

9. Adjournment

The meeting was adjourned the meeting at 17:15 hours on Friday, 14 July 2017.

Annex 1. List of Participants

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9. Adjournment

Annex 3. New England Seamount Closure discussed under agenda item 4a.

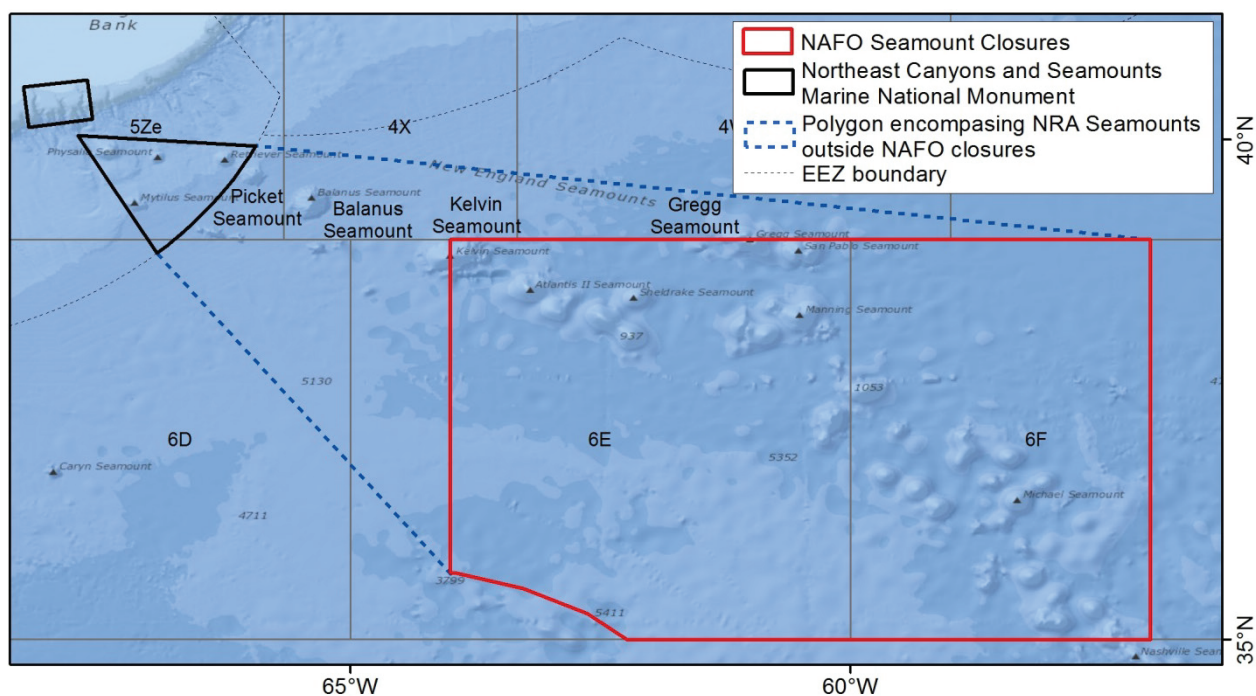



Figure 1. Depiction of NAFO New England Seamount Closure and polygon encompassing NRA seamounts outside the NAFO closure (Source: Figure 1.5.4 of SCS Doc. 16-21).


Annex 4. Presentation: *Canada's Marine Conservation Targets for 2017 and 2020*




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Canada's Marine Conservation Targets for 2017 and 2020: The Role of Fisheries





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Commitments


SDG14 and CBD Aichi Targets 11, e.g.:

- *By 2020 ...10% of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well connected systems of **protected areas** and **other effective area-based conservation measures**, and integrated into the wider landscapes and seascapes.*

Message from our PM and Mandate Letter for our Minister:

- *Work with the Minister of Environment and Climate Change to increase the proportion of Canada's marine and coastal areas that are protected to 5% percent by 2017 and to 10% by 2020.*
- *Work with the provinces, territories, Indigenous Peoples, and other stakeholders to better co-manage our three oceans.*

1





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Challenge Ahead and the Tools to Address Them

Coastal/Marine Protection as of 2015: ~50,000 km² or ~0.9%

Target for 2020: ~ 575,000 km²

Marine Protect Areas (MPAs) - Established by DFO under the *Oceans Act*

- Conserve ecologically significant and/or distinct marine species, habitats and/or ecosystems through full prohibitions or zone-based restrictions of oceans activity

National Marine Conservation Areas (NMCAs) - Established by Parks Canada

- Protect and conserve representative samples of Canada's oceans and Great Lakes\
- Encourages ecologically sustainable use and protects special/sensitive elements of ecosystems

National Wildlife Area (NWA) - Established by Environment and Climate Change Canada

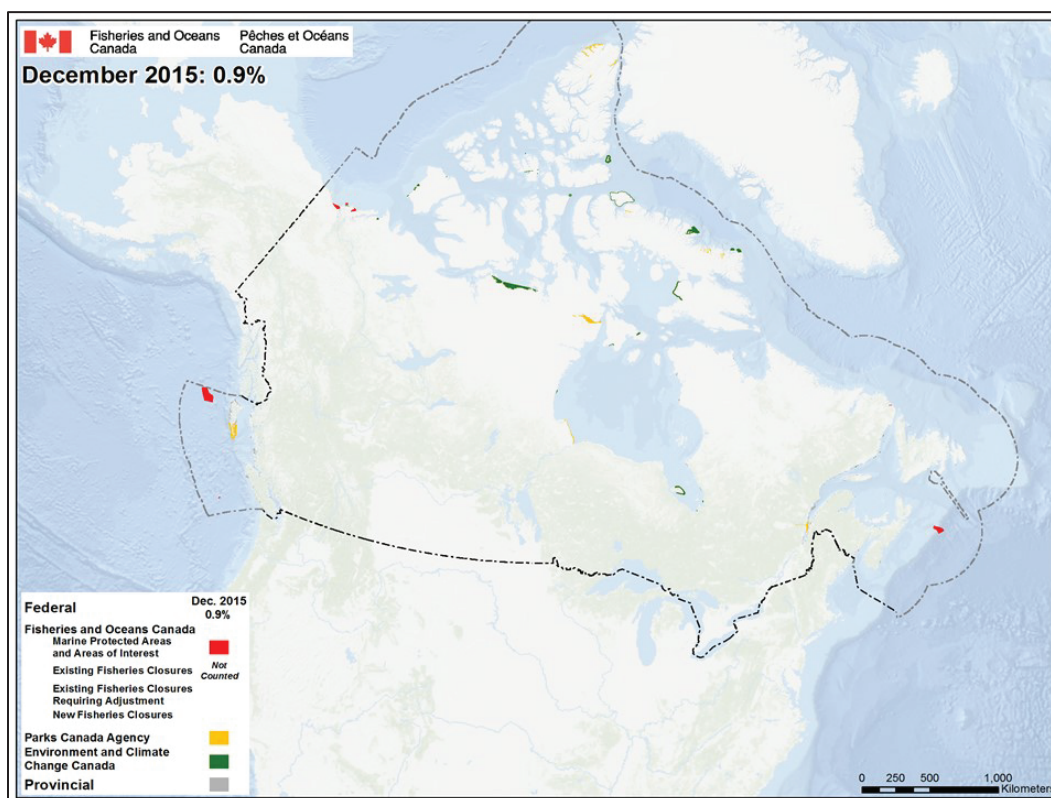
- wildlife conservation (e.g. seabirds), research - prohibited activities vary by site

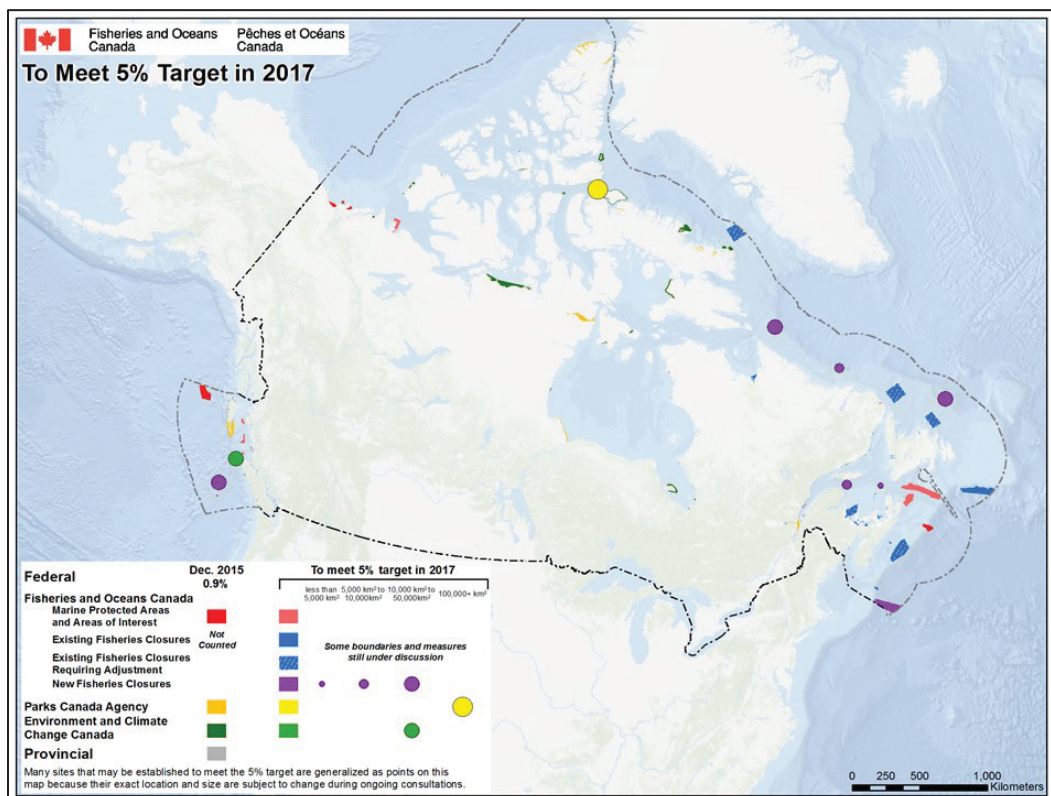
Fisheries Management Measures - Established by DFO under the *Fisheries Act*

- Restrictions on fisheries to protect coastal and marine ecosystems, e.g. area closures, etc.

2

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Principles

1. Science-based decision making

- Data/info sources based on extensive scientific research by Government
- Traditional ecological knowledge (Indigenous peoples) and local knowledge and experience (industry, NGOs and Academic Institutions)

2. Transparency

- Comprehensive engagement with other federal departments, provincial and territorial governments, Indigenous peoples, industry, NGOs, academia and the public

3. Advancing reconciliation with Indigenous groups

- Respect treaties in existence and support advancing the completion of modern treaties under development; traditional knowledge will be sought



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Canada's MCT Five-Point Plan

1) **Finish What Was Started:**

- Advance work already underway in areas progressing towards establishment

2) **Protect Large Areas:**

- Establish new, large Oceans Act Marine Protected Areas in offshore areas where ecologically significant or sensitive areas are located

3) **Protect Areas Under Pressure:**

- Establish additional *Oceans Act* MPAs in areas under pressure from human activities, for example where we are already advancing MPA network development

4) **Advance Other Effective Area-Based Conservation Measures:**

- Identify existing and establish new “other measures,” such as fisheries closures, particularly to protect sensitive sponge and coral concentrations

5) **Establish MPAs Faster:**

- Examine how the *Oceans Act* can be updated to facilitate the designation process for MPAs, without sacrificing science, or the public's opportunity to provide input

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Science Advice on “Other Measures”

- No agreed set of international guidelines on “Other Measures”, work by IUCN, CBD ongoing
- Canada's 2017 target creates urgent need for guidelines to assess fisheries management measures
- DFO commissioned peer reviewed science advice from the Canadian Science Advisory Secretariat (CSAS) in 2015; report published in 2016 - identified key elements to when testing fisheries management measures:

Geographic location	Duration of implementation
Size of managed area	Location in relation to preferred habitat
Management/conservation objectives	Habitat heterogeneity
Adjacent management practices	Full versus partial protection
Spatial relationships (i.e. connectivity)	

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Important Role of Fisheries-based Measures:

Canadian criteria to determine what qualifies as an “Other Effective Area-Based Conservation Measures”:

- 1. Clearly defined geographic location**
- 2. Conservation or stock management objectives**
 - *Measure must have a conservation or stock management objective AND directly reference at least one of the ecological components of interest in its objective*
- 3. Presence of ecological components of interest**
 - *The management measure must contain a habitat important to biodiversity conservation AND a species of regional importance that uses that habitat*
- 4. Long-term duration of implementation**
- 5. The ecological components of interest are effectively conserved**
 - No human activities incompatible with conservation of the ecological components of interest may occur or be foreseeable within the defined geographic location

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Next Steps

Within Canada

- Consultations with Canadian Provinces, Territories, indigenous partners, industry, NGO and other Canadian stakeholders underway
- Announcements throughout the summer, fall and winter

International

- Work bilaterally and multilaterally to conserve marine and coastal biodiversity and achieve commitments on targets, e.g. Leading work by NAFO on VMEs, NEREIDA, etc.
- CBD process:
 - CoP13 (Dec. 2016): Canada has committed to host a technical workshop on marine “other area-based conservation measures” to support reporting on MCT targets
 - Advice from this expert workshop to be submitted to the CBD’s scientific and technical body in July 2018, to inform development of draft guidance on “other measures”
 - Guidance to be submitted to CBD CoP14 for decision (Dec. 2018)
- IUCN undertaking a parallel process to assist with guidance on other effective measures, (eg fisheries management measures), including the hosting of workshops, with a view to providing advice to the CBD

9





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Question for your Consideration

- What is your experience to date in seeking to meet the Aichi 11 targets?
- What role do fisheries management measures play in protecting marine and coastal areas?

Thank you!

DFO MCT Webpage: <http://www.dfo-mpo.gc.ca/oceans/conservation/index-eng.html>

Serial No. N6717NAFO COM-SC Doc. 17-08

**Report of the NAFO Joint Commission-Scientific Council
Working Group on Catch Reporting (WG-CR) and
NAFO Ad hoc Joint Commission-Scientific Council Catch Data Advisory Group (CDAG)
Meeting**

April, May and August 2017
via WebEx

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Report of the NAFO Joint Commission-Scientific Council Working Group on Catch Reporting (WG-CR) and NAFO Ad hoc Joint Commission-Scientific Council Catch Data Advisory Group (CDAG) Meeting

April, May and August 2017
via WebEx

1. Background

Following the February 2017 meeting of WG-CR/CDAG in London UK, it was decided to have a follow-up meeting of CDAG via WebEx in April. It was subsequently decided to hold additional WebEx meetings in May and August. The purpose of these follow-up meetings was to close agenda items 4b and 8 of the Feb 2017 meeting (FC-SC Doc 17-01).

Agenda Item 4b pertains to the work of the Secretariat in the application of the *Catch Estimation Strategy* for estimating the catch in the NAFO Regulatory Area: *4b. Work conducted by the Secretariat on the validation of the 2016 catch estimates*. The estimation focused on three priority stocks: 2+3KLMNO GHL, 3M COD, and 3LNO PLA. Agenda Item 8 pertains to recommendations to forward to SC and FC (now the Commission).

A progress report was circulated in May covering the April meeting (FC-SC CDAG WP 17-04). The present report covers the April, May and August meetings.

2. WebEx Meeting, April 2017

Katherine Sosebee (USA), co-Chair of the WG, opened the meeting at 09:00, Atlantic Daylight Time on 20 April 2017. Representatives from the following Contracting Parties were in attendance: Canada, Denmark (in respect of Faroe Island), European Union, Russian Federation, and United States of America (Annex 2)

The Secretariat presented updated and revised reported 2016 catches of the priority stocks (FC-SC CDAG-WP 17-01 and 17-02) calculated according to the method prescribed in the CDAG Catch Estimation Strategy. The update and revision were made in consideration of the challenges and issues identified in February 2017.

During the presentation, some data entry errors were spotted and corrected accordingly.

The quality of haul by haul data is expected to improve in the subsequent years and this can also be used an important source of fishing effort information.

The WG and CDAG suggested the following to improve the confidence in the estimates:

- For all priority stocks, estimates from observer reports be included, when possible, for comparison purposes,
- For all priority stocks, prepare a graphical representation of the difference in the estimates between the Daily catch reports (CATs) and Port State Control inspection reports (PSC3s) to facilitate the development of a threshold for footnote 2 of the Estimation Strategy
- Further scrutiny of PCS3 in which mis-recording AIs were issued.

3. WebEx Meeting, May 2017

Katherine Sosebee (USA), co-Chair of the WG, opened the meeting at 09:00, Atlantic Daylight Time on 18 May 2017. Representatives from the following Contracting Parties were in attendance: Canada, European Union, Russian Federation, and United States of America (Annex 2)

In response to the suggestions made in April, the Secretariat presented the updated 2016 catch estimates of the three priority stocks (FC-SC CDAG-WP 17-01 Rev and 17-02 Rev.). The update incorporates PSC3 reports that were received late and after the April WebEx meeting. The Secretariat has noted that there were some trips wherein the application of any of the 3 methods specified in the *Strategy* was not possible. In these cases, the CATs (retained + rejected) were used to estimate the catches. The use of the CATs when PSC3 is not available was considered as the new fourth method.

The Secretariat also prepared and presented a graphical representation of the difference in the estimates between the CAT's and the PSC3s (FC-SC CDAG-WP 17-03). Four trips were identified to have >50% difference: three (3) trips in 3M cod estimates; 1 trip in PLA; and none in GHL. Of the four trips, one was issued with an Apparent Infringement (AI) of mis-recording of catches. It was decided to retain the 50%-threshold as prescribed in the footnote 2 of the *Strategy*. In cases where an AI on mis-recording is issued at sea or in port, PSC3 data should not be used.

The *Catch Estimation Strategy* was revised on the basis of the observations mentioned above (see Annex 1).

There were discussions about the limited application of the *Strategy* only to GHL. The limited application is due to the fact that:

- STACTIC requirement of only 15% port inspection coverage except when the landings contain is GHL which in this case the coverage is 100%,
- Many landed catch in PSC3 are reported by species and by combined divisions where the vessels fished during the trip, e.g. reporting the landed catch "RED 3LMNO" would constitute redfish species belonging to 3 different stocks.

On moving forward, ideas emerged concerning stock separation (in addressing the 2nd bullet above). For example, proportions using CAT data can be derived and applied as correction factors in the PSC3 data.

In the intersession, the Secretariat provided the SC, for its full fish stock assessment work in June 2017, the 2016 catch estimates which were derived by applying the *Strategy*, of the following stocks: 2+3KLMNO GHL, 3LNO PLA, 3M COD, 3NO COD, 3M PLA, 3M RED, 3NO WIT, and 3NO.

The EU proposal for a study on "Catch estimates methodologies" was also discussed. Canada questioned the role of the CDAG-WG, and the NAFO Secretariat in the study. The EU agreed on reviewing the Terms of reference accordingly. Canada suggested including "best practices" instead of "single approach" as it could be seen as too prescriptive. Canada offered to provide detailed comments on the proposal in writing to the EU following the meeting. The EU undertook to meet with the NAFO Secretariat during Scientific Council to discuss the way forward.

4. WebEx Meeting, August 2017

Katherine Sosebee (USA), co-Chair of the WG, opened the meeting at 09:00 hours on 24 August 2017. Representatives from the following Contracting Parties were in attendance: Canada, European Union, and United States of America (Annex 2)

Three Working Papers were presented by the Secretariat: 2016 catch estimates for all stocks that were fully assessed by SC in June 2017, GHL reporting by Division in PSC3s, and comparison of 2014 GHL estimates between CDAG and SC.

The Secretariat proposed minor amendments to the wording CDAG catch estimation strategy in order to correct potential ambiguity. Following some discussion, it was agreed to amend the wording. The revised text is included as annex 1.

It was agreed that The Secretariat will apply the CDAG method to all NAFO managed stocks for 2017 catches. WG-CR will review all analyses completed by the NAFO Secretariat of the 2017 catch estimates in early 2018 and consider forwarding PSC3 data as per recommendations 3 a) and 3b) to STACTIC for further consideration at their 2018 intersessional. In order for Scientific Council to complete their work, the catch

estimates from WG-CR should be made available to them no later than 01 May. This will only be possible if Contracting Parties take steps to ensure that reports are submitted in a timely fashion in order to facilitate the work of CDAG/CR.

The quality and completeness of haul by haul catch data are expected to improve in future years and it is likely that the Catch Estimation Strategy will further rely on these data as a source of input for validation.

5. Recommendations arising from the meetings

The CDAG recommends that:

- 1. in an effort to improve operating efficiency, the WG-CR and CDAG be merged into a single technical body with a revised terms of reference to address outstanding issues related to catch reporting; in particular oversight and implementation of the catch estimation strategy and possible ongoing refinement;**
- 2. The NAFO Secretariat apply the CDAG method to all NAFO managed stocks for 2017 catches to be reviewed by WG-CR or its successor in early 2018;**
- 3. to support the ongoing application and refinement of the catch estimate methodology, that the NAFO Secretariat would, in developing their estimates of 2017 catches:**
 - a. analyze the amount of coverage per species by weight of fish caught in the NAFO Regulatory Area that are inspected in port;**
 - b. calculate the availability of port inspection data on a division basis for all NAFO managed species;**
 - c. continue to evaluate the trips where there is a 50% or greater difference between reported CATs and PSC3 landings on a case by case basis;**
- 4. that the Commission request that STACTIC review the submission deadlines of haul by haul data (Article 28.8.b of the NAFO CEM) with the goal of reducing the timeframe for which information is made available for the generation of catch estimates and;**
- 5. that the Commission request that STATIC review current measures relating to reporting of catch by NAFO Division to identify and implement improvements which ensure the most reliable information is available for catch estimation, recognizing its importance in stock assessments.**

Annex 1. Revised *Catch Estimation Strategy* developed by CDAG

Available Data

In recent years, there have been many improvements in the data that vessel masters are required to provide when fishing in the NAFO Regulatory Area (NRA). To date, CDAG has assessed the utility of these data sources and concluded that some data sources, such as tow by tow data, are not in a usable condition for this year.

It is anticipated that with recent improvements to the NAFO Conservation and Enforcement Measures (NCEM), as well as the resolution of technical issues relating to the submission and utilization of tow by tow data that this data source will be ready for use for the validation/estimation of catch. In the case of observer data, further assessment is required of the availability and improvements required to make that data useful.

In evaluating the utility of the current sources of data, CDAG decided that the most complete and timely data available are the daily catch reports (CAT)¹ which are reported by vessel masters to the Secretariat.

Given the completeness and timeliness of the CAT data, it is suggested that this be used as the base data.

Catch weighed off and recorded by port inspection (PSC3) is considered the most accurate. Based on these two factors, the following estimation methodology is proposed:²

1. Where PSC3 data is available, this equivalent live weight (plus recorded discard weight from CATs) be used;
2. For trips where no PSC3 data is available, a correction factor be applied to the sum of the CATs for that trip. The correction factor is defined as follows: the average per cent difference (weighted bycatch) between the CAT total and the PSC3 total for other trips by that same vessel;
3. If no PSC3 data is available at the vessel level, then a flag state factor be determined using the methodology in (2) using all vessels of that flag state;
4. If port inspection data³ other than PSC3 data can be made available by the flag State, use those or;
5. Where no port inspection data are available on a flag State level, the values from the CATs (CA + RJ) be used.

¹ In some instances, SC documents refer to this as DCR

² In instances where the difference between CAT and PSC3 is greater than 50%, it is suggested that the Secretariat follow up with the appropriate Fisheries Monitoring Centre to ensure there is no administrative error. If no error exists but the discrepancy is related to extenuating circumstances which cannot be reconciled by the Secretariat, or because an AI was issued that explains the difference, then the data from that trip should not be used in the development of any correction factor.

³ The CP should demonstrate that the data is of a comparable standard to PSC3

Annex 2: Participation List

April 2017	
Canada	Don Power Lloyd Slaney Bob Fagan Ray Walsh
European Union	Manuel Carmona-Yebra Sebastian Rodriguez-Alfaro Fernando Gonzales-Costas Diana Gonzalez-Troncoso Ricardo Alpoim
	Temur Tairov
United States of America	Katherine Sosebee (Chair)
Denmark (in respect of Faroe Islands + Greenland)	Elin Mortensen
Secretariat	Ricardo Federizon Tom Blasdale Jana Aker
May 2017	
United States of America	Katherine Sosebee (Chair)
European Union	Ricardo Alpoim Sebastian Rodriguez-Alfaro Fernando Gonzales-Costas Diana Gonzalez-Troncoso
Canada	Don Power Lloyd Slaney Bob Fagan Ray Walsh
Secretariat	Ricardo Federizon Tom Blasdale Jana Aker
August 2016	
United States of America	Katherine Sosebee (Chair)
Canada	Bob Fagan Don Powers Ray Walsh Lloyd Slaney
European Union	Raluca Ivanescu Fernando Gonzales-Costas
Secretariat	Tom Blasdale Jana Aker Fred Kingston