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A – FISHERIES COMMISSION AND SCIENTIFIC COUNCIL *AD HOC* WORKING GROUP ON CATCH REPORTING, 20-21 APRIL 2015 - AGENDA

1. Opening
2. Appointment of Rapporteur
3. Adoption of Agenda
4. Review of Status of the WG Recommendations from the February 2014 Meeting
5. Development of a framework for the validation of NAFO catch data and generation of catch estimates
6. Recommendations to forward to the Fisheries Commission and Scientific Council
7. Other matters
8. Adoption of the report
9. Adjournment

B - FISHERIES COMMISSION AND SCIENTIFIC COUNCIL JOINT WORKING GROUP ON RISK-BASED MANAGEMENT STRATEGIES, 22-24 APRIL 2015 – AGENDA

1. Opening
2. Appointment of Rapporteur
3. Adoption of Agenda
4. Review of Status of the WG Recommendations from the February 2014 Meeting
5. Discussions on the revision of the NAFO Precautionary Approach Framework
6. Discussions on the development of Div. 3NO witch flounder RBMS
7. Discussions on the finalization of Div. 3M cod RBMS
8. Development of a management strategy for Div. 3LNO Northern shrimp (*Pandalus borealis*)
9. Recommendations to forward to the Fisheries Commission and Scientific Council
10. Other matters
11. Adoption of the report
12. Adjournment

C – SCIENTIFIC COUNCIL MEETING, 29 MAY - 11 JUNE 2015 – AGENDA

- I. Opening (Scientific Council Chair: Don Stansbury)
 1. Appointment of Rapporteur
 2. Presentation and Report of Proxy Votes
 3. Adoption of Agenda
 4. Attendance of Observers
 5. Appointment of Designated Experts
 6. Plan of Work
 - a. General Discussion
 - b. Stock Assessment Review and Assignment of Reviewers
 7. Housekeeping issues

- II. Review of Scientific Council Recommendations in 2014 and 2015

- III. Fisheries Environment (STACFEN Chair: Andrew Cogswell)
 1. Opening
 2. Appointment of Rapporteur
 3. Adoption of Agenda
 4. Review of Recommendations in 2014
 5. Invited speaker
 6. Integrated Science Data Management (ISDM) Report for 2014
 7. Review of physical, biological and chemical environment in the NAFO Convention Area during 2014
 8. Interdisciplinary studies
 9. Aquatic Climate Change Adaptation Services Program
 10. Formulation of recommendations based on environmental conditions during 2014
 11. National Representatives
 12. Other Matters
 13. Adjournment

- IV. Publications (STACPUB Chair: Margaret Treble)
 1. Opening
 2. Appointment of Rapporteur
 3. Adoption of Agenda
 4. Review of Recommendations in 2014
 5. Review of Publications

- a) Annual Summary
 - i) Journal of Northwest Atlantic Fishery Science (JNAFS)
 - ii) Scientific Council Studies
 - iii) Scientific Council Reports
 - 6. Other Matters
 - a) Progress on revised sponge/coral guide
 - b) Update to JNAFS Website
 - c) Changes to JNAFS Editorial Board
 - 7. Adjournment
- V. Research Coordination (STACREC Chair: Kathy Sosebee)
- 1. Opening
 - 2. Appointment of Rapporteur
 - 3. Review of Recommendations in 2014
 - 4. Fishery Statistics
 - a) Progress report on Secretariat activities in 2014/2015
 - i) STATLANT 21A and 21B
 - 5. Research Activities
 - a) Biological sampling
 - i) Report on activities in 2014/2015
 - ii) Report by National Representatives on commercial sampling conducted
 - iii) Report on data availability for stock assessments (by Designated Experts)
 - b) Biological surveys
 - i) Review of survey activities in 2014 (by National Representatives and Designated Experts)
 - ii) Surveys planned for 2015 and early 2016
 - c) Tagging activities
 - d) Other research activities
 - 6. Review of SCR and SCS Documents
 - 7. Other Matters
 - a) Summary of progress on previous recommendations
 - b) Stock Assessment Spreadsheets
 - c) Participation in H2020 Project
 - 8. Adjournment

- VI. Fisheries Science (STACFIS Chair: Brian Healey)
1. Opening
 2. General Review of Catches and Fishing Activity
 3. Invited speaker
 4. Stock Assessments
1. Greenland Halibut (*Reinhardtius hippoglossoides*) in SA 0, Div. 1A offshore and Divs. 1B-F (fully assessed)
 2. Greenland Halibut (*Reinhardtius hippoglossoides*) Div. 1A inshore (monitor)
 3. Roundnose Grenadier (*Coryphaenoides rupestris*) in Subareas 0 and 1 (monitor)
 4. Demersal Redfish (*Sebastes* spp.) in SA 1 (monitor)
 - 5a. Wolffish in Subarea 1 (monitor)
 - 5b. American plaice (*Hippoglossoides platessoides*) in Subarea 1 (monitor)
 6. Cod (*Gadus morhua*) in Div. 3M (fully assessed)
 7. Redfish (*Sebastes mentella* and *Sebastes fasciatus*) in Div. 3M (fully assessed)
 8. American Plaice (*Hippoglossoides platessoides*) in Div. 3M (monitor)
 9. Cod (*Gadus morhua*) in NAFO Div. 3NO (fully assessed)
 10. Redfish (*Sebastes mentella* and *Sebastes fasciatus*) in Divs. 3L and 3N (monitor)
 11. American Plaice (*Hippoglossoides platessoides*) in Divs. 3LNO (monitor)
 12. Yellowtail flounder (*Limanda ferruginea*) in Divs. 3LNO (fully assessed)
 13. Witch Flounder (*Glyptocephalus cynoglossus*) in Divs. 3NO (fully assessed – special request)
 14. Capelin (*Mallotus villosus*) in Divs. 3NO (fully assessed)
 15. Redfish (*Sebastes mentella* and *Sebastes fasciatus*) in Div. 3O (monitor)
 16. Thorny skate (*Amblyraja radiata*) in Div. 3LNO and Subdiv. 3Ps (monitor)
 17. White Hake (*Urophycis tenuis*) in Div. 3NO and Subdiv. 3Ps (fully assessed)
 18. Roughhead Grenadier (*Macrourus berglax*) in Subareas 2 and 3 (monitor)
 19. Witch Flounder (*Glyptocephalus cynoglossus*) in Divs. 2J+3KL (monitor)
 20. Greenland Halibut (*Reinhardtius hippoglossoides*) in SA 2 + Divs. 3KLMNO (management strategy)
 21. Northern Shortfin Squid (*Illex illecebrosus*) in Subareas 3+4 (monitor)
5. Stocks under a Management Strategy Evaluation (FC Item 3a)
 - a) Greenland halibut in SA 2 and Divs. 3KLMNO
 6. Other Matters
 - a) FIRMS Classification for NAFO Stocks
 - b) Other Business
 7. Adjournment
- VII. Management Advice and Responses to Special Requests
1. Fisheries Commission (Annex 1)

a) Request for Advice on TACs and Other Management Measures (Item 1, Annex 1))

For 2016 and 2017

- Cod in Div. 3M

- Redfish in Div. 3M

- White hake in Divs. 3NO

For 2016, 2017 and 2018

- Cod in Divs. 3NO

- Yellowtail flounder in Divs. 3LNO

- Capelin in Divs. 3NO

b) Monitoring of Stocks for which Multi-year Advice was provided in 2013 or 2014 (Item 1)

- Redfish in Divs. 3LN

- Redfish in Div. 3O

- American plaice in Div. 3M

- American plaice in Divs. 3LNO

- Thorny skate in Divs. 3LNO

- Witch flounder in Divs. 2J + 3KL

- Northern Short-finned Squid (*Illex*) in SA 3+4

c) Special Requests for Management Advice

i) TAC calculation for Greenland halibut in SA2 + Divs. 3KLMNO (Item 2a)

ii) Exceptional circumstances in Greenland halibut MSE (Item 2b)

iii) Selectivity of cod and redfish in Div. 3M (Item 3)

iv) Risk assessment for SAI on VME elements and species (Item 4)

v) Impacts of removing candidate VME closures from survey design (Item 5)

vi) Comment on status and trends of cod in Divs. 2J + 3KL (Item 6)

vii) Full assessment of witch flounder in Divs. 3NO (Item 7)

viii) Assessment and advice for Splendid alfonso (*Beryx splendens*) (Item 8)

ix) The potential for acoustic surveys for Capelin (Item 9)

x) Depth distribution of Greenland halibut (Item 10)

xi) Review of impacts other than fishing in the NAFO Regulatory Area (Item 11)

xii) Impacts of mid-water trawls on VME indicator species (Item 12)

2. Coastal States

a) Request by Denmark (Greenland) for Advice on Management in 2015 (Annex 2)

i) Roundnose grenadier in SA 0+1 (Item 1)

ii) Redfish, Atlantic wolfish, Spotted wolfish and American plaice in SA 1 (Item 2)

iii) Greenland halibut in inshore areas of Div. 1A (Item 4)

iv) *Pandalus borealis* east of Greenland and in the Denmark Strait (in conjunction with ICES). (Item 6)

- b) Request by Canada and Greenland for Advice on Management in 2015 (Annex 2, Annex 3)
 - i) Greenland halibut in Div. 0A and the offshore area of Div. 1A, plus Div. 1B (Annex 2, Item 4; Annex 3, Item 1)
 - ii) Greenland halibut in Div. 0B + Divs. 1C-1F (Annex 2, Item 4, Annex 3, Item 1)
 - iii) *Pandalus borealis* in SA 0+1 (Annex 2, Item 5; Annex 3, Item 2)

VIII. Review of Future Meetings Arrangements

1. Scientific Council (in conjunction with NIPAG), 9 – 16 Sep 2015
2. Scientific Council, 21 – 25 Sep 2015
3. Scientific Council, Jun 2016
4. Scientific Council (in conjunction with NIPAG), Sep 2016
5. Scientific Council, Sep 2016
6. NAFO/ICES Joint Groups
 - a) NIPAG, 9 – 16 Sep 2015
 - b) NIPAG, 2016
 - c) WGDEC
7. WGESA
8. WGHARP

IX. Arrangements for Special Sessions

1. Topics for future Special Sessions

X. Meeting Reports

1. Working Group on Ecosystem Science and Assessment (WGESA), Nov 2014
2. Report from ICES-NAFO Working Group on Deepwater Ecosystems (WGDEC), Mar 2015
3. Report from Joint FC-SC Working Group on Risk Based Management Strategies (WG-RBMS), Apr 2015
4. Report from ad hoc Joint Working Group on Catch Reporting (WG-CR), Apr 2015
5. Meetings attended by the Secretariat:
 - a) CWP
 - b) FIRMS
 - c) FAO VME Practices and Processes

XI. Review of Scientific Council Working Procedures/Protocol

1. General Plan of Work for September 2015 Annual Meeting
2. Other Matters

XII. Other Matters

1. Designated Experts
2. Stock Assessment spreadsheets
3. Scientific Merit Awards
4. Budget items
5. Other Business

XIII. Adoption of Committee Reports

1. STACFEN
2. STACREC
3. STACPUB
4. STACFIS

XIV. Scientific Council Recommendations to General Council and Fisheries Commission

XV. Adoption of Scientific Council Report

XVI. Adjournment

**D - FISHERIES COMMISSION AND SCIENTIFIC COUNCIL WORKING GROUP ON THE ECOSYSTEM
APPROACH FRAMEWORK TO FISHERIES MANAGEMENT, 15-17 JULY 2015 - AGENDA**

1. Opening
2. Appointment of Rapporteur
3. Adoption of Agenda
4. Consideration of SC advice from 2015
 - a. Development of work on Significant Adverse Impacts in support of workplan for assessment of bottom fisheries in 2016
 - b. Removal of closed areas from scientific surveys
 - c. Impact of activities other than fishing on fish stocks and biodiversity in the NRA
 - d. Impacts of mid-water trawls on benthic VME indicator species
5. Consideration of NCEM Articles 17.1 - 17.3 (Seamounts)
6. Discussion of ongoing matters
 - a. Status of Candidate VME areas 13 and 14 (eastern Flemish Cap)
 - b. Status of Div. 30 Coral Closure
 - c. Significant concentrations of VME indicator species on Tail of the Bank (Div. 3N)
7. Implementation of the "Ecosystem Approach"
 - a. Review of the "Roadmap to an Ecosystem Approach"
 - b. Addressing other factors impacting the ecosystem
 - c. Future direction of FC-SC WG-EAFFM
8. Other matters
 - a. Coral and Sponge Identification Guide – NAFO Area
 - b. Wording of NCEM Article 24
9. Recommendations to forward to the Fisheries Commission and Scientific Council
10. Adoption of the report
11. Adjournment

E - SCIENTIFIC COUNCIL MEETING, 9-16 SEPTEMBER 2015 - AGENDA

- I. Opening (Chair: Don Stansbury)
 1. Appointment of Rapporteur
 2. Adoption of Agenda
 3. Attendance of Observers
 4. Plan of Work
- II. Review of Recommendations in 2014
- III. NAFO/ICES *Pandalus* Assessment Group (Co-chairs Brian Healey and Peter Shelton)
- IV. Formulation of Advice (see Annexes 1–3 of Appendix I)
 1. Request from Fisheries Commission (Items 1 of Annex 1)
 - a) Northern shrimp (Div. 3M)
 - b) Northern shrimp (Div. 3LNO)
 2. Requests from Coastal States (Items 5 and 6 of Annex 2, Item 2 of Annex 3)
 - a) Northern shrimp (Subareas 0 and 1)
 - b) Northern shrimp (in Denmark Strait and off East Greenland)
- V. Other Matters
 1. Scheduling of Future Meetings
 2. Topics for Future Special Sessions
 3. Other Business
 - a) A tribute to Dave Orr
 - b) Election of chairs
- VI. Adoption of Scientific Council and NIPAG Reports
- VII. Adjournment

F - NAFO/ICES *PANDALUS* ASSESSMENT GROUP (NIPAG) MEETING, 9-16 SEPTEMBER 2015 - AGENDA

- I. Opening (Co-chairs: Brian Healey and Peter Shelton)
 1. Appointment of Rapporteur
 2. Adoption of Agenda¹
 3. Plan of Work
- II. General Review
 1. Review of Recommendations in 2014
 2. Review of Catches
- III. Stock Assessments
 - Northern shrimp (Division 3M)
 - Northern Shrimp (Divisions 3LNO)
 - Northern shrimp (Subareas 0 and 1)
 - Northern shrimp (in Denmark Strait and off East Greenland)
 - Northern shrimp in Skagerrak and Norwegian Deep (ICES Divisions IIIa and IVa East)
 - Northern Shrimp in Barents Sea and Svalbard area (ICES Sub-areas I & II)
- IV. Other Business
 - FIRMS Classification for NAFO Shrimp Stocks
 - Future Meetings
 - Long-term management strategy for Northern shrimp (*Pandalus borealis*) in Skagerrak and the Norwegian Deep
 - Chairs of Future Meetings
- V. Adjournment

G - SCIENTIFIC COUNCIL MEETING, 21-25 SEPTEMBER 2015 – AGENDA**I. Opening**

1. Opening
2. Appointment of Rapporteur
3. Adoption of Agenda
4. Plan of Work
 - a) Joint FC – SC Session

II. Review of Scientific Council Recommendations**III. Research Coordination**

1. Opening
2. Fisheries Statistics
 - a) Progress Reports on Secretariat Activities
 - b) Review of STATLANT21
3. Research Activities
 - a) Surveys Planned for 2015 and early 2016
4. Other Matters
 - a) Review of SCR and SCS Documents
 - b) Review of Survey SCS Document
 - c) Other Business

IV. Fisheries Science

1. Opening
2. Nomination of Designated Experts
3. Other Matters
 - a) Review of SCR and SCS Documents
 - b) 2016 invited speaker
 - c) Other Business

V. Requests from the Fisheries Commission

1. Requests deferred from the June Meeting
 - a) Capelin in Div. 3NO
 - b) Advice on Yellowtail flounder for 2018
2. *Ad hoc* Requests from Current Meeting

VI. Meeting Reports

1. NAFO Joint Fisheries Commission-Scientific Council Working Group on the Ecosystem Framework for Fisheries Management (WG-EAFFM)

VII. Review of Future Meeting Arrangements

VIII. Future Special Sessions

1. Discussion of proposed topics

IX. Other Matters

1. Report of the NAFO *Ad Hoc* Working Group on Bycatches, Discards and Selectivity (WG-BDS)
2. Presentation on redfish recruitment

X. Adoption of Reports

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

XI. Adjournment

ANNEX 1. FISHERIES COMMISSION'S REQUEST FOR SCIENTIFIC ADVICE ON MANAGEMENT IN 2015 AND BEYOND OF CERTAIN STOCKS IN SUBAREAS 2, 3 AND 4 AND OTHER MATTERS

1. Fisheries Commission requests that the Scientific Council provide advice for the management of the fish stocks below according to the assessment frequency presented below. The advice should be provided as a range of management options and a risk analysis for each option (rather than a single TAC recommendation).

<u>Yearly basis</u>	<u>Two year basis</u>	<u>Three year basis</u>
Northern shrimp in Div. 3LNO	American plaice in Div. 3LNO Cod in Div. 3M Redfish in Div. 3LN Redfish in Div. 3M Northern Shrimp in Div. 3M Thorny skate in Div. 3LNO White hake in Div. 3NO Witch flounder in Div. 3NO	American plaice in Div. 3M Capelin in Div. 3NO Cod in Div. 3NO Northern shortfin squid in SA 3+4 Redfish in Div. 3O Witch flounder in Div. 2J+3KL Yellowtail flounder in Div. 3LNO

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

In 2015, advice should be provided for 2016 for Northern Shrimp in NAFO Div. 3LNO

In 2015, advice should be provided for 2016 and 2017 for Cod in Div. 3M and Redfish in Div. 3M, White hake in Div. 3NO.

In 2015, advice should be provided for 2016, 2017 and 2018 for Cod in Div. 3NO, Yellowtail Flounder in 3LNO and Capelin 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.

The Fisheries Commission also requests the Scientific Council to continue to monitor the status of all these stocks annually and, should a significant change be observed in stock status (e.g. from surveys) or in by-catches in other fisheries, provide updated advice as appropriate.



2. The Fisheries Commission adopted in 2010 an MSE approach for Greenland halibut stock in Subarea 2 + Division 3KLMNO (FC Document 10/12). This approach considers a survey based harvest control rule (HCR) to set a TAC for this stock on an annual basis. The Fisheries Commission requests the Scientific Council to:
 - a. Monitor and update the survey slope and to compute the TAC according to HCR adopted by the Fisheries Commission according to Annex 1 of FC Document 10/12.
 - b. Advise on whether or not an exceptional circumstance is occurring.
3. The Fisheries Commission requests the Scientific Council to analyze and provide advice on management measures that could improve selectivity in the Div. 3M cod and Div. 3M redfish fisheries in the Flemish Cap in order to reduce possible by catches and discards. The objective is to reduce the mixed fisheries between cod and redfish, the by-catch of non-targeted stocks and to analyze if the selectivity pattern could be improved to reduce the catch of undersized fish.
4. The Fisheries Commission requests the Scientific Council to continue to develop work on Significant Adverse Impacts in support of the reassessment of NAFO bottom fishing activities required in 2016, specifically an assessment of the risk associated with bottom fishing activities on known and predicted VME species and elements in the NRA.
5. Recognizing the work done in NAFO to prevent significant adverse impacts to vulnerable marine ecosystems, and the need for effective stock assessments;
Further recognizing that modifications to survey designs occur on regular basis in fisheries surveys in many cases,

FC requests that SC investigate the impacts of removing the closed areas from the survey design for relevant stock surveys.
6. For the cod stock in Div. 2J+3KL, the Scientific Council is requested to comment on the trends in biomass and state of the stock in the most recent Science Advisory Report from the Canadian Science Advisory Secretariat.
7. The Fisheries Commission requests the Scientific Council to conduct a full assessment of witch flounder in Div. 3NO.
8. Please provide a stock assessment for Alfonsino, and recommendation.
9. Could the SC liaise with the national institutes of the different CPs to see if – as recommended by STACFIS – acoustic surveys for capelin can be carried out?
10. There are some spatial and depth coverage deficiencies in the Greenland Halibut survey. It is suspected that there is a component of the Greenland Halibut stock of age-class 14+ that lives in depths under 1 500 meters and is therefore inaccessible to scientific trawling. Please:
 - a. comment on this hypothesis;
 - b. indicate if information on this part of the stock would be useful for the stock assessment and the understanding of the stock dynamics;
 - c. indicate if there are techniques available to assess the biomass below 1 500 meters, and;
 - d. if useful and possible, implement such techniques in view of the next stock assessment.
11. The NAFO 2011 Performance Review Panel encouraged NAFO to consider whether activities other than fishing in the NAFO Convention Area may impact the stocks and fisheries for which NAFO is responsible as well as biodiversity in the NAFO Regulatory Area. Such activities might include oil exploration, shipping and recreational activities. Some work has been carried out as part of the ecosystem approach.
As the first step in the assessment of such impacts and for the implementation of the priorities of the Ecosystem Roadmap, could the Scientific Council provide a literature survey that would indicate what the risks are to the fish stocks and ecosystems in the NAFO Regulatory Area by looking at comparable situations.
12. The Fisheries Commission requests the Scientific Council to evaluate the impact of mid-water trawls on VME indicator species in those instances when the gear makes contact with or is lost on the bottom.

ANNEX A: GUIDANCE FOR PROVIDING ADVICE ON STOCKS ASSESSED WITH AN ANALYTICAL MODEL

The Fisheries 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: $2/3 F_{msy}$, $3/4 F_{msy}$, $85\% F_{msy}$, $75\% F_{2014}$, F_{2014} , $125\% F_{2014}$,
- For stocks under a moratorium to direct fishing: F_{2014} , $F = 0$.

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 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 2015 and following years*	Yield 2015 (50%)	Yield 2016 (50%)	Yield 2017 (50%)	P(F>F _{lim})			P(B<B _{lim})			P(F>F _{msy})			P(B<B _{msy} P)			P(B ₂₀₁₇ > B ₂₀₁₄)
				2015	2016	2017	2015	2016	2017	2015	2016	2017	2015	2016	2017	
$2/3 F_{msy}$	t	t	t	%	%	%	%	%	%	%	%	%	%	%	%	%
$3/4 F_{msy}$	t	t	t	%	%	%	%	%	%	%	%	%	%	%	%	%
$85\% F_{msy}$	t	t	t	%	%	%	%	%	%	%	%	%	%	%	%	%
$0.75 X F_{2014}$	t	t	t	%	%	%	%	%	%	%	%	%	%	%	%	%
F_{2014}	t	t	t	%	%	%	%	%	%	%	%	%	%	%	%	%
$1.25 X F_{2014}$	t	t	t	%	%	%	%	%	%	%	%	%	%	%	%	%
F=0	t	t	t	%	%	%	%	%	%	%	%	%	%	%	%	%



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} , $2/3 F_{max}$, $3/4 F_{max}$, $85\% F_{max}$, $75\% F_{2014}$, F_{2014} , $125\% F_{2014}$,
- For stocks under a moratorium to direct fishing: F_{2014} , $F = 0$.

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 2015 and following years*	Yield 2015	Yield 2016	Yield 2017	P(F>F _{lim})			P(B<B _{lim})			P(F>F _{0.1})			P(F>F _{max})			P(B ₂₀₁₇ > B ₂₀₁₄)
				2015	2016	2017	2015	2016	2017	2015	2016	2017	2015	2016	2017	
F _{0.1}	t	t	t	%	%	%	%	%	%	%	%	%	%	%	%	%
F _{max}	t	t	t	%	%	%	%	%	%	%	%	%	%	%	%	%
66% F _{max}	t	t	t	%	%	%	%	%	%	%	%	%	%	%	%	%
75% F _{max}	t	t	t	%	%	%	%	%	%	%	%	%	%	%	%	%
85% F _{max}	t	t	t	%	%	%	%	%	%	%	%	%	%	%	%	%
0.75 X F ₂₀₁₄	t	t	t	%	%	%	%	%	%	%	%	%	%	%	%	%
F ₂₀₁₄	t	t	t	%	%	%	%	%	%	%	%	%	%	%	%	%
1.25 X F ₂₀₁₄	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. DENMARK (ON BEHALF OF GREENLAND) REQUEST FOR SCIENTIFIC ADVICE ON MANAGEMENT IN 2015 OF CERTAIN STOCKS IN SUBAREAS 0 AND 1

1. For Roundnose grenadier in Subarea 0 + 1 advice was in 2014 given for 2015-2017. Denmark (on behalf of Greenland) requests the Scientific Council to continue to monitor the status of Roundnose grenadier in Subareas 0 and 1 annually, and should significant changes in the stock status be observed (e.g. from surveys) the Scientific Council is requested to provide updated advice as appropriate.
2. Advice for golden redfish (*Sebastes marinus*), demersal deep-sea redfish (*Sebastes mentella*) American plaice (*Hippoglossoides platessoides*), Atlantic wolffish (*Anarhichas lupus*) and spotted wolffish (*A. minor*) in Subarea 1 was in 2014 given for 2015-2017. Denmark (on behalf of Greenland) requests the Scientific Council to continue to monitor the status of these species annually, and should significant changes in stock status be observed the Scientific Council is requested to provide updated advice as appropriate.
3. Subject to the concurrence of Canada as regards Subareas 0 and 1, the Scientific Council is requested to provide advice on appropriate TAC levels for 2016 separately for Greenland halibut in 1) the offshore areas of NAFO Division 0A and Division 1A plus Division 1B and 2) NAFO Division 0B plus Divisions 1C-1F. The Scientific Council is also asked to advice on any other management measures it deems appropriate to ensure the sustainability of these resources.
4. Advice for Greenland halibut in Division 1A (inshore) was in 2014 given for 2015-2016. Denmark (on behalf of Greenland) requests the Scientific Council to continue to monitor the status of Greenland halibut in Division 1A (inshore) annually, and should significant changes in stock status be observed, the Scientific Council is requested to provide updated advice as appropriate.
5. Subject to the concurrence of Canada as regards Subarea 0 and 1, Denmark (on behalf of Greenland) further requests the Scientific Council before December 2015 to provide advice on the scientific basis for management of Northern shrimp (*Pandalus borealis*) in Subarea 0 and 1 in 2015 and for as many years ahead as data allows for.
6. Furthermore, 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 2016 and for as many years ahead as data allows for.

ANNEX 3. REQUESTS FOR ADVICE FROM CANADA

- 1) The Scientific Council is requested, subject to the concurrence of Denmark (on behalf of Greenland) as regards Subarea 1, to provide an overall assessment of status and trends in the total stock area throughout its range and to specifically advise on TAC levels for 2016, separately, for Greenland halibut in Divisions 0A+1A (offshore) and 1B, and Divisions 0B+1C-F.⁷ The Scientific Council is also asked to provide advice on any other management measures it deems appropriate to ensure the sustainability of these resources.
 - a. It is noted that at this time only general biological advice 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 and include likely risk considerations and implications as much as possible, including risks of maintaining current TAC levels and any risks and available details of observations that would support an increase or decrease in the TACs.
 - b. Recognizing that this is a data poor fishery, and that no model exists at this time to provide risk-based advice to inform management options, the Scientific Council is also asked to identify what would be required in order to provide risk based advice in the future.

The following graphs should be presented, for one or several surveys, for the longest time-period possible:

- historical catches;
 - abundance and biomass indices;
 - an age or size range chosen to represent the spawning population;
 - an age or size range chosen to represent the exploited population;
 - recruitment proxy or index for an age or size-range chosen to represent the recruiting population;
 - fishing mortality proxy, such as the ratio of reported commercial catches to a measure of the exploited population;
 - stock trajectory against reference points
 - Any other information the Scientific Council feels is relevant should also be provided.
- 2) Canada requests the Scientific Council to consider the following options in assessing and projecting future stock levels for Shrimp in Subareas 0 and 1:
 - a) The status of the stock should be reviewed and management options evaluated in terms of their implications for fishable stock size, spawning stock size, recruitment prospect, catch rate and catch over the next 5 years. The implications of catch options ranging from 30,000t to the catch corresponding to Z MSY, in 5,000 t increments, should be forecast for 2016 through 2020 if possible, and evaluated in relation to precautionary reference points of both mortality and fishable stock biomass. Results should include a partitioning of the future estimable removals between catches and estimable predation for the various catch options requested. The present stock size and fishable stock size should be described in relation to those observed historically and those to be expected in the next 5 years under the various catch options requested, and any other options Scientific Council feels worthy of consideration.

⁷ The Scientific Council has noted previously that there is no biological basis for conducting separate assessments for Greenland halibut throughout Subareas 0-3, but has advised that separate TACs be maintained for different areas of the distribution of Greenland halibut.

- b) Management options should be provided within the Northwest Atlantic Fisheries Organization Precautionary Approach Framework. Uncertainties in the assessment should be evaluated and presented in the form of risk analyses related to the limit reference points of B_{lim} and Z_{MSY} .
- c. Presentation of the results should include the following:
- a graph and table of historical yield and fishing mortality for the longest time period possible;
 - a graph of biomass relative to B_{MSY} , and recruitment levels for the longest time period possible.
 - a graph of the stock trajectory compared to B_{lim} and/or B_{MSY} and Z_{MSY} ;
 - graphs and tables of total mortality (Z) and fishable biomass for a range of projected catch options (as noted in 2 a) for the years 2016 to 2020 if possible. Projections should include both catch options and a range of cod biomass levels considered appropriate by SC. Results should include risk analyses of falling below B_{MSY} and B_{lim} , and of exceeding Z_{MSY} ;
 - a graph of the total area fished for the longest time period possible; and
 - any other graph or table the Scientific Council feels is relevant.
- 3) Canada requests the Scientific Council to explore the impact of proposed harvest strategies that would maintain the North Atlantic harp seal population at a precautionary level of a PA framework, using the Canadian levels as a case study, and that would have a low risk of decreasing below the critical level. (Received 7 July 2014)

LIST OF SCR AND SCS DOCUMENTS – 2015

SCR Documents			
Doc No.	Serial No	Author(s)	Title
SCR Doc. 15/01	N6416	John Mortensen	Report on hydrographic conditions off Southwest Greenland June/July 2014
SCR Doc. 15/02	N6417	Boris Cisewski	Hydrographic conditions off West Greenland in 2014
SCR Doc. 15/03	N6421	O.A. Jørgensen	Survey for Greenland Halibut in NAFO Divisions 1C-1D, 2014
SCR Doc. 15/04	N6422	Paula Fratantoni	Hydrographic Conditions on the Northeast United States Continental Shelf in 2014 – NAFO Subareas 5 and 6
SCR Doc. 15/05	N6424	D. Hebert & R. G. Pettipas	Physical Oceanographic Conditions on the Scotian Shelf and in the eastern Gulf of Maine (NAFO Divisions 4V, W, X) during 2014
SCR Doc. 15/06	N6425	V.I. Vinnichenko	On stock size and fishery management of splendid alfonsino (<i>Beryx splendens</i>) on the Corner Rise Seamount
SCR Doc. 15/07	N6427	Diana González-Troncoso, Esther Román, Nair Vilas & Adriana Nogueira	Results for Greenland halibut, American plaice and Atlantic cod of the Spanish survey in NAFO Divs. 3NO for the period 1997-2014
SCR Doc. 15/08	N6428	Diana González-Troncoso, Adriana Nogueira & Nair Vilas	Yellowtail flounder, redfish (<i>Sebastes</i> spp) and witch flounder indices from the Spanish Survey conducted in Divisions 3NO of the NAFO Regulatory Area
SCR Doc. 15/09	N6429	Diana González-Troncoso, Nair Vilas & Adriana Nogueira	Biomass and length distribution for roughhead grenadier, thorny skate and white hake from the surveys conducted by Spain in NAFO 3NO
SCR Doc. 15/10	N6430	G. Maillet, P. Pepin, B. Casault, C. Johnson, S. Plourde, M. Starr, E. Head, C. Caverhill, H. Maass, J. Spry, A. Cogswell, S. Fraser, C. Porter, G. Redmond, & T. Shears	Ocean Productivity Trends in the Northwest Atlantic During 2014
SCR Doc. 15/11	N6431	E. Colbourne, J. Holden, D. Senciall, W. Bailey, J. Craig and S. Snook	Physical Oceanographic Environment on the Newfoundland and Labrador Shelf in NAFO Subareas 2 and 3 during 2014
SCR Doc. 15/12	N6432	P. Pepin, K. Azetsu-Scott, M. Starr, S. Punshon, G. Maillet, J. Chassé, P. Galbraith, B. Greenan, D. Lavoie, & C. Johnson	Preliminary Results of an ACCASP Funded Study of the Delineation of Ocean Acidification and Calcium Carbonate Saturation State of the Atlantic Zone
SCR Doc. 15/13	N6434	E. Colbourne and A. Perez-Rodriguez	Physical Oceanographic Conditions on the Flemish Cap in NAFO Subdivision 3M during 2014
SCR Doc. 15/14	N6435	M. Ouellet	Oceanography and Scientific Data, NAFO Report 2014
SCR Doc. 15/15	N6436	I. Yashayaev, E.J.H. Head, K. Azetsu-Scott, M. Ringuette, Z. Wang, J. Anning and S. Punshon	Environmental Conditions in the Labrador Sea during 2014

SCR Doc. 15/16	N6437	Rasmus Nygaard & Ole A. Jørgensen	Biomass and Abundance of Demersal Fish Stocks off West and East Greenland estimated from the Greenland Institute of Natural resources Shrimp Fish Survey, 1988-2014.
SCR Doc. 15/17	N6438	José Miguel Casas and Diana González Troncoso	Results from Bottom Trawl Survey on Flemish Cap of June-July 2014
SCR Doc. 15/18	N6439	Fernando González-Costas	Assessment of Splendid alfoncino (<i>Beryx splendens</i>) in NAFO Subarea 6
SCR Doc. 15/19	N6440	Esther Román, Concepción González-Iglesias and Diana González-Troncoso	Results for the Spanish Survey in the NAFO Regulatory Area of Division 3L for the period 2003-2014
SCR Doc. 15/20	N6441	Esther Román, Ángeles Armesto and Diana González-Troncoso	Results for the Atlantic cod, roughhead grenadier, redfish, thorny skate and black dogfish of the Spanish Survey in the NAFO Divs. 3L for the period 2003-2014
SCR Doc. 15/21	N6442	Fernando González-Costas, Ane Iriondo, Diana González-Troncoso and Agurtzane Urtizberea	Possible technical measures that could be applied in NAFO 3M cod.
SCR Doc. 15/22	N6444	D. Power, B.P. Healey, and D.W. Ings	Performance and description of Canadian multi-species bottom trawl surveys in NAFO subarea 2 + Divisions 3KLMNO, with emphasis on 2012-2014
SCR Doc. 15/23	N6447	M.R. Simpson, C.M. Miri, and R.K. Collins	An Assessment of White Hake (<i>Urophycis tenuis</i> , Mitchell 1815) in NAFO Divisions 3N, 3O, and Subdivision 3Ps
SCR Doc. 15/24	N6448	Solari <i>et al.</i>	System dynamics: Analysis and modelling: West Greenland Halibut (WGH)
SCR Doc. 15/25	N6449	Solari <i>et al.</i>	On West Greenland Halibut Dynamic: Environmental Forcing
SCR Doc. 15/26	N6450	D. Maddock Parsons and Rick Rideout	Divisions 3LNO Yellowtail Flounder (<i>Limanda ferruginea</i>) in the 2013 and 2014 Canadian Stratified Bottom Trawl Surveys (Abstract)
SCR Doc. 15/27	N6451	I. S. Tretyakov	Capelin Stock Assessment in NAFO Divisions 3NO Based on Data from Trawl Surveys
SCR Doc. 15/28	N6452	A. Ávila de Melo, R. Dominguez-Petit, M. Casas, D. González Troncoso, F. González-Costas, K. Fromin, N. Brites, R. Alpoim and F. Saborido-Rey	An Assessment of Beaked Redfish (<i>S. mentella</i> and <i>S. fasciatus</i>) in NAFO Division 3M (at times when natural mortality is driven stock dynamics and fishing mortality reference points are useless to scientific advice)
SCR Doc. 15/29	N6453	Dawn Maddock Parsons, Joanne Morgan & Don Power	Assessment of NAFO Divs. 3LNO Yellowtail Flounder
SCR Doc. 15/30	N6454	M. A. Treble	Report on Greenland halibut caught during the 2014 trawl survey in Divisions 0A and 0B
SCR Doc. 15/31	N6456	R. Nygaard	Trawl, gillnet and longline survey results from surveys conducted by the Greenland Institute of Natural Resources in NAFO Division 1A Inshore

SCR Doc. 15/32	N6457	O.A. Jørgensen & M.A. Treble	Assessment of the Greenland Halibut Stock Component in NAFO Subarea 0 +Division 1A Offshore + Divisions 1B-1F
SCR Doc. 15/33	N6458	Diana González-Troncoso	Assessment of the Cod Stock in NAFO Division 3M
SCR Doc. 15/34	N6460	R.M. Rideout, D.W. Ings, J. Bratney, and K. Dwyer	An Assessment of the Cod Stock in NAFO Divisions 3NO
SCR Doc. 15/35	N6462	M.A. Treble & O.A. Jorgensen	Implementation of advice for data-limited stocks: A survey approach for Greenland halibut in SA 0+1
SCR Doc. 15/36	N6463	Diana González-Troncoso, Agurtzane Urtizbera, Fernando González-Costas, David Miller, Ane Iriondo and Dorleta García	Results of the 3M Cod MSE
SCR Doc. 15/37	N6464	M. Joanne Morgan, C. Hvingel, and M. Koen-Alonso	Surplus production models in a Bayesian framework applied to witch flounder in NAFO Divs. 3NO
SCR Doc. 15/38	N6465	E. Lee, J. Morgan, R. M. Rideout	An assessment of the witch flounder resource in NAFO Divisions 3NO
SCR Doc. 15/39	N6466	Rasmus Nygaard	Fisheries and catches of Greenland Halibut Stock Component in NAFO Division 1A Inshore in 2014.
SCR Doc. 15/40	N6467	M.R. Simpson, J.A. Bailey, R.K. Collins, C.M. Miri, and L.G.S. Mello	Limit reference points for Divs. 3LNO Thorny Skate (<i>Amblyraja radiata</i> Donovan, 1808) and Divs. 3NOPs White Hake (<i>Urophycis tenuis</i> , Mitchill 1815
SCR Doc. 15/41	N6468	M.J. Morgan	Greenland halibut (<i>Reinhardtius hippoglossoides</i>) in NAFO Subarea 2 and Divisions 3KLMNO: stock trends based on annual Canadian research vessel survey results.
SCR Doc. 15-042	N6477	Nanette Hammeken-Arboe	Greenland Fishery
SCR Doc. 15-043	N6478	A.Burmeister and M.C.S. Kingsley	The West Greenland trawl survey for <i>Pandalus borealis</i> , 2015, with reference to earlier results
SCR Doc. 15-044	N6479	A.Burmeister and M.C.S. Kingsley	A Provisional Assessment of the Shrimp Stock off West Greenland in 2015
SCR Doc. 15-045	N6480	H. Siegstad	Results of the Greenland Bottom Trawl Survey for Northern shrimp (<i>Pandalus borealis</i>) Off East Greenland (ICES Subarea XIV b), 2008-2015
SCR Doc. 15-046	N6481	H. Siegstad	Occurrence of <i>Pandalus montagui</i> in Trawl Survey Samples from NAFO Subareas 0+1 2000-2015
SCR Doc. 15-047	N6482	J. M. Casas	Northern Shrimp (<i>Pandalus borealis</i>) on Flemish Cap Surveys 2015
SCR Doc. 15-048	N6483	Casas, J.M., E. Román and J. Teruel	Northern Shrimp (<i>Pandalus borealis</i> , Krøyer) from EU-Spain Bottom Trawl Survey 2015 in NAFO Div. 3LNO
SCR Doc. 15-049	N6484	Nanette Hammeken-Arboe	Greenland Catch table
SCR Doc. 15-050	N6485	M. C. S. Kingsley	Greenland Model description
SCR Doc. 15-051	N6486	Nanette Hammeken-Arboe	Greenland Fishery East Coast
SCR Doc. 15-052	N6488	C. Hvingel and T. H. Thangstad	Research survey results pertaining to Northern shrimp (<i>Pandalus borealis</i>) in the Barents Sea and Svalbard area 2004-2014

SCR Doc. 15-053	N6489	C. Hvingel and T. H. Thangstad	The Norwegian fishery for northern shrimp (<i>Pandalus borealis</i>) in the Barents Sea and round Svalbard 1970-2015
SCR Doc. 15-054	N6490	Carsten Hvingel	Shrimp (<i>Pandalus borealis</i>) in the Barents Sea – Stock assessment 2014
SCR Doc. 15-055	N6491	K. Skanes & D. E. Stansbury	Canadian 3LNO Assessment Paper
SCR Doc. 15-056	N6492	Anders Nielsen, Sten Munch- Petersen, Ole Eigaard, Sovik Guldborg and Mats Ulmestrand	A stochastic length-based assessment model for the <i>Pandalus</i> stock in Skagerrak and the Norwegian Deep
SCR Doc. 15-057	N6493	G. Søvik and T. H. Thangstad	The Norwegian Fishery for Northern Shrimp (<i>Pandalus borealis</i>) in Skagerrak and the Norwegian Deep (ICES Divisions IIIa and IVa east), 1970-2015
SCR Doc. 15-058	N6494	G. Søvik and T. H. Thangstad	Results of the Norwegian Bottom Trawl Survey for Northern Shrimp (<i>Pandalus borealis</i>) in Skagerrak and the Norwegian Deep (ICES Divisions IIIa and IVa east) in 2015
SCR Doc. 15-059	N6495	Carsten Hvingel	The 2015 assessment of the North Sea/Skagerrak shrimp stock using a Bayesian surplus production model
SCR Doc. 15-060	N6496	M. Ulmestrand, M. Bergenius, O. Eigaard, G. Søvik and S. Munch-Petersen	The Northern shrimp (<i>Pandalus borealis</i>) Stock in Skagerrak and the Norwegian Deep (ICES Divisions IIIa and IVa East)
SCR Doc. 15-061	N6509	Zakharov D.V.	Results of Russian investigations of the Northern shrimp in the Barents Sea in 2004-2015
SCR Doc. 15-062	N6512	J. Vargas, B. Alcoforado and A. M. Ávila de Melo	By-catch of cod, Greenland halibut and American plaice in redfish fisheries on NAFO Divisions 3L and 3N, 2010-2014

SCS Documents			
Doc No.	Serial No	Author	Title
SCS Doc. 15-01	N6411		FC Requests to SC
SCS Doc. 15-02	N6418	Canada	Canada's Request for Coastal State Advice
SCS Doc. 15-03	N6419	Greenland	Denmark (on behalf of Greenland) Request for Scientific Advice on Management in 2016 of Certain Stocks in Subarea 0 and 1
SCS Doc. 15-04	N6420	T.Tõrra & S.Sirp	Estonian Research Report for 2014
SCS Doc. 15-05	N6423	F. González-Costas, , A. Gago, G. Ramilo, E. Román, D. González- Troncoso, M. Casas, M. Sacau, E. Guijarro and. J. Lorenzo	Spanish Research Report for 2014
SCS Doc. 15-06	N6426	J. Vargas, R. Alpoim, E. Santos and A. M. Ávila de Melo	Portuguese Research Report for 2014
SCS Doc. 15-07	N6433	Russia	Russian Research Report for 2014
SCS Doc. 15-08	N6443	Canada	Canadian Research Report for 2014 Newfoundland and Labrador Region
SCS Doc. 15-09	N6445	K. A. Sosebee	United States Research Report for 2014
SCS Doc. 15-10	N6446	Greenland	Denmark/Greenland Research Report for 2014
SCS Doc. 15-11	N6461	NAFO Secretariat	Biological Sampling 2014
SCS Doc. 15-12 REV	N6469	NAFO Secretariat	Report of the SC 31 May- 11 June 2015
SCS Doc. 15-13	N6497	NAFO Secretariat	NIPAG Report
SCS Doc. 15-14	N6506	NAFO	SC Shrimp Rpt
SCS Doc. 15-15	N6507	NAFO	SC Annual Meeting Rpt
SCS Doc. 15-16	N6510	NAFO	Surveys
SCS Doc. 15-17	N6521	NAFO	Year to Year
SCS Doc. 15-18	N6522	NAFO	Tagging

LIST OF REPRESENTATIVES, ADVISERS, EXPERTS AND OBSERVERS, 2015

A	Fisheries Commission and Scientific Council <i>ad hoc</i> Working Group on Catch Reporting, 20-21 April 2015
B	Fisheries Commission and Scientific Council Joint Working Group on Risk-Based Management Strategies, 22- 24 April 2015
C	Scientific Council Meeting, 29 May - 11 June 2015
D	Fisheries Commission and Scientific Council Working Group on the Ecosystem Approach Framework to Fisheries Management, 15-17 July 2015
E	Scientific Council Meeting, 9-16 September 2015
F	NAFO/ICES <i>Pandalus</i> Assessment Group (NIPAG) Meeting, 9-16 September 2015
G	Scientific Council Meeting, 21-25 September 2015
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MERIT AWARDS

Year	Recipient	Institute
2009	Ralph Mayo	NMFS Woods Hole, MA, USA
2010	Dr. Manfred Stein	Institut für Seefischerei, Hamburg, Germany
2011	Dr. Vladimir Rikhter	AtlantNIRO, Kaliningrad
2013	Bill Brodie	DFO, St. John's, NL, Canada
2013	Jean-Claude Mahé	IFREMER Lorient, France
2013	Antonio Vázquez	Spain, European Union
2014	Fred Serchuk	Northeast Fisheries Science Center (NEFSC), USA

LIST OF RECOMMENDATIONS IN 2015

From the Joint FC-SC Ad hoc Working Group on Catch Reporting(WG-CR) – 20 -21 April 2015

Recommendations to forward to the Fisheries Commission and Scientific Council

It is recommended:

2. that SC and FC give consideration to the establishment of the Catch Data Advisory Group and adopt its Terms of Reference (Annex 3); and
3. that SC and FC or an appropriate subsidiary body review the utility of data collection more generally, noting that some newer data sets provide more reliable and/ or timely information, making others redundant.

From the Joint FC-SC Working Group on Risk-Based Management Strategies (WG-RBMS) – 22-24 April, 2015

9. Recommendations to forward to the Fisheries Commission and Scientific Council

The Working Group recommends that:

1. Scientific Council convenes a technical working group which could explore the revision of the precautionary approach.
3. Scientific Council gives a high priority to development of reference points for all stocks which lack them.
4. Scientific Council performs a review of the Div. 3M cod MSE.
5. Scientific Council discusses the following HCR options for Div. 3M cod:
 - a. Starting points
 - i. $F_{\text{status quo}}$
 - ii. 40% reduction
 - b. An HCR which meets management objectives 1 (very low risk of breaching B_{lim}) and 2 (low risk of overfishing) within five years, and within ten years, with:
 - i. risk calculated for each year in the time series
 - ii. risk calculated for the end of the periods (final year)
 - iii. risk averaged over the periods

From the 29-May-11 June Scientific Council Meeting

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

- STACFEN **recommends** *consideration of support for one invited speaker to address emerging issues and concerns for the NAFO Convention Area during the 2016 STACFEN Meeting.*
- STACFEN **recommends** *that a sub-committee of STACFEN members be formed to discuss and draft a plan towards the reconfiguration and/or amalgamation of STACFEN and WGESA to be presented at the 2015 STACFEN Meeting.*
- STACFEN **recommends** *that a sub-committee of STACFEN members be formed to discuss the current state of Fisheries and Oceans Canada (DFO) Oceanographic Services (formerly ISDM and MEDS) data management responsibilities to NAFO and related mechanisms for the reporting of oceanographic data by member states and the subsequent means of accessing these data.*

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

- STACPUB **recommends** *that the Secretariat contact WGESA for further instruction on the VME Guides in order to publish it for September 2015.*
- STACPUB **recommends** *that Scientific Council consider holding another symposium and that a list of potential topics and themes be put forward.*
- STACPUB **recommends** *that the NAFO Secretariat look into this matter, update their current list of SC members and create a forum for the electronic exchange of ideas that is accessible to SC members*

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

- STACREC **recommends** *that the NAFO Secretariat develop a framework for communicating tagging study information to vessels from Contracting Parties and Coastal States fishing in the Convention Area (e.g., via a link to this information on the NAFO website homepage).*
- STACREC **recommends** *that the Scientific Council support the EU H2020-BG02-2015 proposal "Predicting consequences of climate change on Aquatic FOOD production (AFOOD)" and agrees to serve on the external advisory board.*

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

There were no general recommendations arising from STACFIS

From STACFIS

4. Redfish in SA1

STACFIS reiterated the **recommendation** *that the species composition and quantity of redfish discarded in the shrimp fishery in SA 1 be further investigated.*

05b. American plaice in Subarea 1

STACFIS reiterated the **recommendation** *that the species composition and quantity of American plaice discarded in the shrimp fishery in SA1 be further investigated.*

STACFIS reiterated the **recommendation** *that the distribution of these species in relation to the main shrimp-fishing grounds in SA1 be investigated, in order to further discover means of reducing the amount of discarded American plaice in the by-catch.*

6. Cod in Div. 3M

STACFIS **recommended** *that an age reader comparison exercise be conducted.*

STACFIS **recommended** that *the most recent catch at age figures will be revised.*

7. Redfish in Div. 3M

STACFIS **recommended** that, *in order to quantify the most likely redfish depletion by cod on Flemish Cap, and be able to have an assessment independent approach to the magnitude of such impact by species and to the size structure of the redfish most affected by cod predation, the existing feeding data from the past EU surveys be analyzed on a refined scale.*

STACFIS also **recommends** that *this important line of ecosystem research based on the feeding sampling routine of the EU survey catch be done on an annual basis.*

8. American plaice in Div. 3M

STACFIS **recommends** that *several input frameworks be explored in both models (such as: q 's; M (e.g. in relation to $F_{0.1}$); ages dependent of the stock size; the proxies and its distribution in the VPA-type Bayesian model).*

Due to the recent improved recruitment at low SSB, STACFIS **recommends** to *explore the Stock/Recruitment relationship and B_{lim} .*

9. Cod (*Gadus morhua*) in Divs. 3NO

STACFIS **recommended** *continuing to monitor the consistency in trends between the Canadian and EU-Spain surveys.*

STACFIS **recommends** *investigating the potential use of a plus group in the assessment model.*

11. American plaice in Div. 3LNO

STACFIS **recommended** that *investigations be undertaken to compare ages obtained by current and former Canadian age readers.*

STACFIS **recommends** that *investigations be undertaken to examine the retrospective pattern and take steps to improve the model.*

12. Yellowtail flounder (*Limanda ferruginea*) in Divs. 3LNO

STACFIS **recommends** that *further work be undertaken to better understand the uncertainties estimated in the ASPIC model.*

14. Capelin in Div. 3NO

STACFIS reiterates its **recommendation** that *initial investigations to evaluate the status of capelin in Div. 3NO should utilize trawl acoustic surveys to allow comparison with the historical time series.*

15. Redfish in Div. 3O

STACFIS **recommended** that *for Redfish in Div. 3O, a recruitment index be developed for this stock.*

17. White hake in Div. 3NO

STACFIS **recommended** that *age determination should be conducted on otolith samples collected during annual Canadian surveys (1972-2014+); thereby allowing age-based analyses of this population.*

STACFIS **recommended** that *the collection of information on commercial catches of white hake be continued and now include sampling for age, sex and maturity to determine if this is a recruitment fishery.*

STACFIS **recommended** that *survey conversion factors between the Engel and Campelen gear be investigated for this stock.*

STACFIS **recommends** that *work continue on the development of population models and reference point proxies.*

20. Greenland Halibut (*Reinhardtius hippoglossoides*) in SA 2 + Divs. 3KLMNO

STACFIS **recommended** that *methods for estimating catch for 2011-2014 be explored for Greenland Halibut in SA 2 + Divs. 3KLMNO, including where ever possible the utility of using effort in conjunction with estimates of catch per unit effort.*

21. Northern shortfin squid in SA 3+4

STACFIS **recommended** that *gear/vessel conversion factors be computed to standardize the 1970-2003 relative abundance and biomass indices from the July Div. 4VWX surveys.*

From the FC-SC WGEAFFM, 15-17 July 2015

9. Recommendations to forward to the Fisheries Commission and Scientific Council

The Working Group **recommends**:

In relation to Progress of the Workplan on SAI in support of reassessment of bottom fisheries in 2016:

1. that **Scientific Council should take into account the protection afforded to VME areas outside the NAFO fisheries footprint in the calculation of the VME area and biomass at risk of bottom fishing impact;**
2. that **Scientific Council refine VME kernel density analysis polygon boundaries, taking into account current understanding of distribution patterns in relation to environmental variables.**

In relation to removal of closed areas from scientific surveys:

3. that **Scientific Council considers options to expedite a risk assessment of trawl surveys impact on VME in closed areas, and the effect of excluding surveys from these areas on stock assessments.**

In relation to Other matters:

8. that **Scientific Council consider widening the scope of the NAFO coral and sponge identification guides to include other relevant species on seamounts.**

From the NIPAG Meeting, 9-16 September 2015

1. Northern Shrimp in Div. 3M

For Northern Shrimp in Div. 3M NIPAG **recommends** that *further exploration of the relationship between shrimp, cod and the environment be continued in WGESA and NIPAG encourages the shrimp experts to be involved in this work.*

2. Northern Shrimp (*Pandalus borealis*) in Div. 3LNO

NIPAG **recommended** that *ecosystem information related to the role of shrimp as prey in the Grand Bank (i.e. 3LNO) Ecosystem be presented to the 2016 NIPAG meeting.*

3. Northern Shrimp in SA 0+1

NIPAG **recommended** that:

- *given that the CPUE series for the Greenland sea-going and coastal fleets continue to agree while neither agrees with changes in the survey estimates of biomass since 2002, possible causes for change in the relationship between fishing efficiency and biomass should be investigated;*
- *the relationship between estimated numbers of small shrimps and later estimates of fishable biomass should be investigated anew.*

Survey trends inshore and offshore are divergent and NIPAG **recommends** *exploration of the nature and implications of this divergence.*