PART F: MISCELLANEOUS

A –NAFO SCIENTIFIC COUNCIL GREENLAND HALIBUT STOCK ASSESSMENT AND MANAGEMENT STRATEGY EVALUATION MEETING, 03-07 APRIL 2017 –AGENDA

1. Opening - Introductions, meeting arrangements
2. Appointment of rapporteur
3. Adoption of agenda
4. Background, Terms of Reference (Chair)
5. Introductory presentations
    a. Recommendations from the RBMS meeting
6. Assessment models considered:
    - XSA
    - SCAA
    - SAM style
    - ASAP
    - Bayesian surplus production model
7. Review results from available operating models
8. Discuss elements of other possible operating models to be developed prior to June SC meeting
9. Develop advice for RBMS re quantification of objectives/performance criteria and constraints
10. Specify MP "trials", including operating model variants to be fit, projection specifications, observation models for future generated data, and performance statistics (initial quantification of objectives)
11. Possibly give guidance for development of Candidate Management Strategies and/or HCRs
12. Conclusions

B- NAFO SCIENTIFIC COUNCIL MEETING, 01- 15 JUNE 2017 – AGENDA

I. Opening (Scientific Council Chair: Kathy Sosebee)
   1. Appointment of Rapporteur
   2 Presentation and Report of Proxy Votes
   3. Adoption of Agenda
   4. Attendance of Observers
   5. Appointment of Designated Experts
   6. Plan of Work
   7. Housekeeping issues

II. Review of Scientific Council Recommendations in 2016

III. Fisheries Environment (STACFEN Chair: Andrew Cogswell)
   1. Opening
   2. Appointment of Rapporteur
   3. Adoption of Agenda
   4. Review of Recommendations in 2016
   5. Department of Fisheries and Oceans Canada, Oceans Science Branch, Marine Environmental Data Section (MEDS) (formerly ISDM) Report for 2016
   6. Review of the physical, biological and chemical environment in the NAFO Convention Area during 2016
   7. Interdisciplinary studies
   8. Formulation of recommendations based on environmental conditions during 2016
   9. National Representatives
   10. Other Matters
   11. Adjournment

IV. Publications (STACPUB Chair: Margaret Treble)
   1. Opening
   2. Appointment of Rapporteur
   3. Adoption of Agenda
   4. Review of Recommendations in 2016
   5. Review of Publications
      a) Annual Summary
         i) Journal of Northwest Atlantic Fishery Science (JNAFS)
         ii) Scientific Council Studies
         iii) Scientific Council Reports
   6. Other Matters
   7. Adjournment

V. Research Coordination (STACREC Chair: Brian Healey)
   1. Opening
   2. Appointment of Rapporteur
   3. Review of Recommendations in 2016
   4. Fishery Statistics
      a) Progress report on Secretariat activities in 2016/2017
         i) Presentation of catch estimates from daily catch reports and STATLANT 21A and 21B

5. Research Activities
   a) Biological sampling
      i) Report on activities in 2016/2017
      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 2016 (by National Representatives and Designated Experts)
      ii) Surveys planned for 2017 and early 2018
   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) EU project on 3M cod
   d) Greenland halibut age determination workshop.
8. Adjournment

VI. Fisheries Science (STACFIS Chair: Joël Vigneau)
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 Div. 1B-F (monitor)
   2. Greenland halibut (*Reinhardtius hippoglossoides*) Div. 1A inshore (monitor)
   4. Demersal redfish (*Sebastes* spp.) in SA 1 (fully assessed)
   5a. Wolffish in SA 1 (fully assessed)
   5b American plaice (*Hippoglossoides platessoides*) in SA 1(monitor)
   6. Cod (*Gadus morhua*) in Div. 3M (fully assessed)
   7. Redfish (*Sebastes mentella* and *Sebastes fasciatus*) in Div. 3M (fully assessed)
   7b Golden redfish (*Sebastes norvegicus* aka *S. marinus*) in Div. 3M (fully assessed – special request)
   8. American plaice (*Hippoglossoides platessoides*) in Div. 3M (fully assessed)
   9. Cod (*Gadus morhua*) in NAFO Divs. 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 (monitor)
   13. Witch flounder (*Glyptocephalus cynoglossus*) in Divs. 3NO (fully assessed)
   14. Capelin (*Mallotus villosus*) in Divs. 3NO (monitor)
   15. Redfish (*Sebastes mentella* and *Sebastes fasciatus*) in Div. 3O (monitor)
   16. Thorny skate (*Amblyraja radiata*) in Divs. 3LNO and Subdiv. 3Ps (monitor)
   17. White hake (*Urophycis tenuis*) in Divs. 3NO and Subdiv. 3Ps (fully assessed)
   18. Roughhead grenadier (*Macrourus berglax*) in SAs 2 and 3 (monitor)
   19. Witch flounder (*Glyptocephalus cynoglossus*) in Divs. 2J+3KL (monitor)
   20. Greenland halibut (*Reinhardtius hippoglossoides*) in SA 2 + Divs. 3KLMNO (fully assessed)
   21. Northern shortfin squid (*Illex illecebrosus*) in SAs 3+4 (monitor)

5. Stocks under a Management Strategy
   a) Greenland halibut in SA 2 and Divs. 3KLMNO
   b) Redfish in Divs. 3LN

6. Other Matters
   a) FIRMS Classification for NAFO Stocks
   b) Other Business
      Scheduling of benchmarks
      External review process for SC advice.
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)
      <u>For 2018</u>
      - Cod in Div. 3M
      <u>For 2018 and 2019</u>
      - Redfish in Div. 3M
      - Witch flounder in Divs. 3NO
      - White hake in Divs. 3NO
      <u>For 2018, 2019 and 2020</u>
      - Cod in Divs. 3NO
      - American plaice in Div. 3M

   b) Monitoring of Stocks for which Multi-year Advice was provided in 2015 or 2016 (Item 1)
      - American Plaice in Divs. 3LNO
      - Yellowtail flounder in Divs. 3LNO
      - Capelin in Divs. 3NO
      - Redfish in Div. 3O
      - Thorny skate in Divs. 3LNOPs
      - Witch Flounder in Divs. 2J+3KL

   c) Special Requests for Management Advice
      i) Implement relevant steps in the workplan for Greenland halibut in SA2 + Divs. 3KLMNO (Item 2)
      ii) Continue risk assessments for impacts of trawl surveys on VME in closed areas (Item 3)
      iii) Bycatch of cod, redfish and moratoria species from haul-by-haul data (Item 4)
      iv) Assessment of golden redfish in Div. 3M (Item 5)
      v) Continue review of PA framework (Item 7)
      vi) Review information on Greenland sharks (Item 8)
      vii) Start working on a Strength, Weaknesses, Opportunities and Threats (SWOT) analysis (Item 9)
      viii) Assessment of cod in Divs. 3NO

2. Coastal States
   a) Request by Denmark (Greenland) for Advice on Management in 2018 (Annex 2)
      i) Golden redfish, demersal deep-sea redfish, Atlantic wolffish and spotted wolfish (Item 1)

   ii) *Pandalus borealis* east of Greenland and in the Denmark Strait (in conjunction with ICES). (Item 4)
b) Request by Canada and Greenland for Advice on Management in 2018 (Annex 2, Annex 3)
   i) Greenland halibut in Div. 0A and the offshore area of Div. 1A, plus Div. 1B (Annex 2, Item 3; Annex 3, Item 1)
   ii) *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), 2017
2. Scientific Council, 18 – 22 Sep. 2017
3. Scientific Council, June 2018
4. Scientific Council (in conjunction with NIPAG), 2018
5. Scientific Council, Sep. 2018
6. NAFO/ICES Joint Groups
   a) NIPAG, 2017
   b) NIPAG, 2018
7. WG-ESA, 7 – 16 Nov. 2017
8. WG-DEC
9. WG-HARP
10. 3M Cod benchmark

IX. Arrangements for Special Sessions
1. Topics for future Special Sessions

X. Meeting Reports
1. Working Group on Ecosystem Science and Assessment (WG-ESA), Nov. 2016
2. Report from ICES-NAFO Working Group on Deep-water Ecosystems (WG-DEC), Mar. 2017
3. Report from Joint FC-SC Working Group on Risk Based Management Strategies (WG-RBMS), Feb. 2017 and Apr. 2017
4. Report from Joint FC-SC Working Group on Catch Reporting (WG-CR), Feb. 2017 and Apr. 2017
6. Meetings attended by the Secretariat

XI. Review of Scientific Council Working Procedures/Protocol
1. General Plan of Work for September 2017 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

C – NAFO SCIENTIFIC COUNCIL MEETING, 18- 22 SEPTEMBER 2017–AGENDA

I. Plenary Session

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 2017 and 2018
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) Assessments from the June meeting
   c) Other Business

V. Requests from the Fisheries Commission

1. Requests/advice deferred from the June Meeting
   a) Scientific Council budget for 2018
   b) Requests arising from Working Groups in 2017
2. *Ad hoc* Requests from Current Meeting

VI. Meeting Reports

1. Report of the NAFO *Ad Hoc* Working Group on Bycatches, Discards and Selectivity (WG-BDS), July 2017
2. Report of the NAFO Joint Commission-Scientific Council Working Group on Risk-Based Management Strategies (WG-RBMS), February, April, and July 2017
3. Report of the NAFO Joint Commission-Scientific Council Working Group on the Ecosystem Framework for Fisheries Management (WG-EAFFM), July 2017
4. Reports of the Joint Commission–Scientific Council *Ad hoc* Working Group on Catch Reporting (WG-CR) and of the Catch Data Advisory Group (CDAG), February and May 2017

VII. Review of Future Meeting Arrangements

VIII. Future Special Sessions

1. Discussion of proposed topics

IX. Other Matters

1. Timeline for the PA framework review
2. Preparations for 3M cod benchmark
3. Scheduling benchmarks

X. Adoption of Reports

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

XI. Adjournment

D – NAFO SCIENTIFIC COUNCIL MEETING, 27 SEPTEMBER – 03 OCTOBER 2017 – AGENDA

I. Opening (Chair: Karen Dwyer)

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

II. Review of Recommendations in 2016

III. NAFO/ICES *Pandalus* Assessment Group (Co-chairs Karen Dwyer and Guldborg Søvik)

IV. Formulation of Advice (see Annexes 1–3 of Appendix I)

1. Request for Advice on TACs and Other Management Measures (Item 1, Annex I)
   a) Northern shrimp in Div. 3LNO
   b) Northern shrimp in Div. 3M

2. Requests from Coastal States (Items 5 and 6 of Annex II, item 2 of Annex III)
   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

VI. Adoption of Scientific Council and NIPAG Reports

VII. Adjournment

E – NAFO/ICES *PANDALUS* ASSESSMENT GROUP (NIPAG) MEETING, 27 SEPTEMBER – 03 OCTOBER 2017 –AGENDA

I. Opening (Co-chairs Karen Dwyer and Guldborg Søvik)

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

II. General Review

1. Review of Recommendations in 2015 and in 2016
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)*
- *Northern shrimp in Fladen Ground (ICES Division IVa)*

IV. Other Business

1. FIRMS Classification for NAFO Shrimp Stocks

FISHERIES COMMISSION'S REQUEST FOR SCIENTIFIC ADVICE ON MANAGEMENT IN 2018 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).

Yearly basis	Two year basis	Three year basis
Northern shrimp in Div. 3LNO	American plaice in Div. 3LNO	American plaice in Div. 3M
Cod in Div. 3M	Redfish in Div. 3M	Capelin in Div. 3NO
	Northern shrimp in Div. 3M	Cod in Div. 3NO
	Thorny skate in Div. 3LNO	Northern shortfin squid in SA 3+4
	White hake in Div. 3NO	Redfish in Div. 3O
	Witch flounder in Div. 3NO	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 2017, advice should be provided for 2018 for Northern shrimp in NAFO Div. 3LNO and Cod in Div 3M*.

In 2017, advice should be provided for 2018 and 2019 for ,Redfish in 3M, Witch flounder in 3NO, Shrimp in 3M.

In 2017, advice should be provided for 2018, 2019 and 2020 for Cod in 3NO, American plaice in Div. 3M

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 bycatch in other fisheries, provide updated advice as appropriate.

2. The Fisheries Commission requests the SC to implement the steps of the work plan relevant to the SC for progression of the Greenland halibut Management Strategy Evaluation Review (FC Working Paper 16/11 Rev 2 adopted at the NAFO 2017 annual meeting).
3. FC requests that Scientific Council continue its risk assessment of scientific trawl surveys impact on VME in closed areas, and the effect of excluding surveys from these areas on stock assessments.
4. The Fisheries Commission requests the SC, based on analysis of the 2016 haul by haul data and patterns of fishing activity, to examine relative levels of by-catch and discards of 3M cod/redfish, and stocks under moratoria in the different circumstances (e.g. fisheries areas, season, fleets, depths, timing).
5. The stock of redfish 3M covers catches of three Sebastes species and the scientific advice is based on data of only two species (*S. mentella* and *S. fasciatus*). Golden redfish, *Sebastes marinus* (aka norvegicus), represents part of the catch but has not yet been subject to a full assessment in NAFO. The Scientific Council is requested to conduct a full assessment on 3M golden Redfish in June 2017 .The Scientific Council is also requested to advice on the implications for the three species in terms of catch reporting and stock management.
6. In relation to the assessment of NAFO bottom fisheries , the Fisheries Commission endorsed the next re-assessment in 2021 and that the SC should:
    - Assess the overlap of NAFO fisheries with VME to evaluate fishery specific impacts in addition to the cumulative impacts;

- Consider clearer objective ranking processes and options for objective weighting criteria for the overall assessment of risk;
- Maintain efforts to assess all of the six FAO criteria (Article 18 of the FAO International Guidelines for the Management of Deep Sea Fisheries in the High Seas) including the three FAO functional SAI criteria which could not be evaluated in the current assessment (recovery potential, ecosystem function alteration, and impact relative to habitat use duration of VME indicator species).
- Continue to work on non-sponge and coral VMEs (for example bryozoan and sea squirts) to prepare for the next assessment.
- the SC further develop and compile identification guides for fishes (e.g. sharks and skates) that could be provided to observers.

7. The Fisheries Commission requests the SC to continue progression on the review of the NAFO PA Framework.
8. Fisheries Commission requests the Scientific Council, by their 2018 annual meeting engage with relevant experts as needed, review the available information on the life history, population status, and current fishing mortality of Greenland sharks (Somniosus microcephalus), on longevity and records of Greenland shark bycatch in NAFO fisheries, and develop advice for management, in line with the precautionary approach, for consideration by the Fisheries Commission.
9. Fisheries Commission requests the Scientific Council start working on and finalizing by SC 2018 a strategic scientific plan based on a Strength, Weaknesses, Opportunities and Threats (SWOT) analysis defining the strategy and the mid and long term objectives and tasks in view of NAFO's amended convention objectives. The plan should define for each strategic objective goals, tasks and measurable targets.

* 3M Cod Benchmark process has been delayed at the request of the Fisheries Commission in favour of the Greenland Halibut MSE work plan

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_{2016}, F_{2016}, 125% F_{2016},
    - For stocks under a moratorium to direct fishing: F_{2016}, 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													
				$P(F>F_{lim})$			$P(B<B_{lim})$				$P(F>F_{msy})$			$P(B<B_{msy})$			$P(B2019 > B2016)$
F in 2017 and following years*	Yield 2018 (50%)	Yield 2019 (50%)	Yield 2020 (50%)	2017	2018	2019	2017	2018	2019		2017	2018	2019	2017	2018	2019	
2/3 F_{msy}	t	t	t	%	%	%	%	%	%		%	%	%	%	%	%	%
3/4 F_{msy}	t	t	t	%	%	%	%	%	%		%	%	%	%	%	%	%
85% F_{msy}	t	t	t	%	%	%	%	%	%		%	%	%	%	%	%	%
F_{msy}	t	t	t	%	%	%	%	%	%		%	%	%	%	%	%	%
0.75 X F_{2016}	t	t	t	%	%	%	%	%	%		%	%	%	%	%	%	%
F_{2015}	t	t	t	%	%	%	%	%	%		%	%	%	%	%	%	%
1.25 X F_{2016}	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_{2016}, F_{2016}, 125% F_{2016},
- For stocks under a moratorium to direct fishing: F_{2015}, 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													
				$P(F.>F_{lim})$			$P(B<B_{lim})$			$P(F>F0.1)$			$P(F>F_{max})$				$P(B2019 > B2016)$
F in 2017 and following years*	Yield 2018	Yield 2019	Yield 2020	2017	2018	2019	2017	2018	2019	2017	2018	2019	2017	2018	2019		
F0.1	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_{2016}	t	t	t	%	%	%	%	%	%	%	%	%	%	%	%		%
F_{2015}	t	t	t	%	%	%	%	%	%	%	%	%	%	%	%		%
1.25 X F_{2016}	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.

DENMARK (ON BEHALF OF GREENLAND) REQUESTS FOR SCIENTIFIC ADVICE ON MANAGEMENT IN 2018 OF CERTAIN STOCKS IN SUBAREA O AND 1.

1. **Golden Redfish, Demersal deep-sea Redfish, Atlantic Wolffish and Spotted Wolffish:** Advice on Golden Redfish *(Sebastes marinus),* Demersal Deep-sea Redfish *(Sebastes mentella),* Atlantic Wolffish *(Anarhichas lupus)* and Spotted Wolffish *(Anarhichas minor)* in Subarea 1 was in 2014 given for 2015-2017. Denmark (on behalf of Greenland) requests the Scientific Council for advice on these species.

2. **Greenland Halibut, offshore: For Greenland Halibut in subareas O + 1 advice was in 2016 given for 2017 and 2018.** Subject to the concurrence of Canada as regards Subareas O and 1, the Scientific Council is requested to continue to monitor the status, and should significant changes in the stock status be observed the Scientific Council is requested to provide updated advice as appropriate for Greenland Halibut in 1) the offshore areas of NAFO Division OA and Division 1A plus Division 1B and 2) NAFO Division OB plus Divisions 1C-1F. The Scientific Council is also asked to advise on any other management measures it deems appropriate to ensure the sustainability of these resources.

3. **Greenland Halibut, inshore, Northwest Greenland:** Advice on Greenland Halibut in Division 1A inshore was in 2016 given for 2017-2018. Denmark (on behalf of Greenland) requests the Scientific Council to continue to monitor the status, and should significant changes in the stock status be observed the Scientific Council is requested to provide updated advice as appropriate.

4. **Northern Shrimp, West Greenland:** Subject to the concurrence of Canada as regards Subarea O and 1, Denmark (on behalf of Greenland) requests the Scientific Council before December 2017 to provide advice on the scientific basis for management of Northern Shrimp *(Panda/us borealis)* in Subarea O and 1 in 2018 and for as many years ahead as data allows for.

5. **Northern Shrimp. East Greenland:** Furthermore, the Scientific Council is in cooperation with ICES requested to provide advice on the scientific basis for management of Northern Shrimp *(Panda/us borealis)* in Denmark Strait and adjacent waters east of southern Greenland in 2018 and for as many years ahead as data allows for.

CANADA'S REQUEST FOR COASTAL STATE ADVICE - 2018

1. Greenland halibut (Subareas 0 and 1)

Advice on Greenland Halibut in Subareas 0 and 1 was provided in 2016 for 2017 and 2018. Therefore, Canada requests the Scientific Council to continue to monitor the status of this stock annually and, should a significant change be observed in stock status (e.g. from surveys) or in bycatches in other fisheries, provide updated advice as appropriate.

2. Shrimp (Divisions 0A and Subarea 1)

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

The status of the stock should be determined and management options evaluated for catch options ranging from 30,000 t to the catch corresponding to Z_{MSY}, in 5,000-10,000 t increments (subject to the discretion of Scientific Council), with forecasts for the next 5 years if possible. These options should be evaluated in relation to the Northwest Atlantic Fisheries Organization Precautionary Approach Framework and presented in the form of risk analyses related to the limit reference points B_{lim} and Z_{MSY}.

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

- historical and current yield, biomass relative to B_{MSY}, total mortality relative to Z_{MSY}, and recruitment (or proxy) levels for the longest time period possible;
- total mortality (Z) and fishable biomass for a range of projected catch options (as noted above) for the years 2018 to 2022 if possible. Projections should include both catch options and a range of effective cod predation biomass levels considered appropriate by the Scientific Council. Results should include risk analyses of falling below: B_{MSY}, 80% B_{MSY} and B_{lim}, and of exceeding Z_{MSY};
- total area fished for the longest time period possible; and
- any other graph or table the Scientific Council deems relevant.

LIST OF SCR AND SCS DOCUMENTS – 2017

SCR Documents			
Doc No.	Serial No	Author	Title
SCR Doc. 17-001REV	N6641	John Mortensen	Report on hydrographic conditions off Southwest Greenland June/July 2016
SCR Doc. 17-002	N6644	Rebecca A. Rademeyer and Doug S. Butterworth	Initial Applications of Statistical Catch-at-Age Assessment Methodology to the Greenland Halibut Resource
SCR Doc. 17-003	N6645	Rebecca A. Rademeyer and Doug S. Butterworth	Management Procedures for Greenland Halibut
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C	Scientific Council Meeting, 18-22 September 2017
D	Scientific Council Meeting, 27 September -03 October 2017
E	NAFO/ICES Pandalus Assessment Group Meeting, 27 September –04 October 2017

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MERIT AWARDS

Year	Recipient	Institute
2009	Ralph Mayo	NMFS Woods Hole, MA, USA
2010	Dr. Manfred Stein	Institut fur 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
2016	Mariano Koen-Alonso	DFO, St. John's, NL, Canada
2017	Eugene Colbourne	DFO, Dartmouth, NS, Canada
2017	Don Power	DFO, St. John's, NL, Canada

LIST OF RECOMMENDATIONS IN 2017

From the Scientific Council June Meeting, 1 – 15 June 2017

The recommendation 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 2018 STACFEN Meeting.*

- STACFEN **recommends** *support for, and requests an executive summary from, an upcoming meeting on calanoid copepod dynamics planned for 19-20 July, 2017.*

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

- STACPUB **recommends** that *the NAFO Secretariat check the Designated Expert list on a quarterly basis and update the public website as required.*

- STACPUB **recommends** that *Designated Experts and other SC members review the fact sheets and provide the Secretariat with any updates or corrections to help refine the fact sheets.*

- STACPUB **recommends** that *the Secretariat monitor the web traffic on the fact sheets using Google Analytics and provide the metrics at the 2018 STACPUB meeting.*

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). A proposal on this recommendation will be tabled by the Secretariat for consideration at the Sept 2016 SC meeting.*

- STACREC **recommends** that *an analysis of sampling rates be conducted to evaluate the impact on the precision of survey estimates.*

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. The Council endorsed recommendations specific to each stock and they are highlighted under the relevant stock considerations below.

From STACFIS:

6. Cod 3M (*Gadus morhua*) in Div. 3M

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

STATUS: No progress. An age-readers Workshop will be held in November 2017 in order to reconcile the differences among age-readers of this stock.

Although a benchmark for 3M cod was planned to be developed in April 2017, it was delayed in September 2016 by the Fisheries Commission. STACFIS **recommends** that *it is carried out in April 2018*.

8. American Plaice (*Hippoglossoides platessoides*) in Div.3M

STACFIS **recommends** that *several input frameworks be explored in both models (such as: q's; M (e.g. in relation to F0.1); ages dependent of the stock size; the proxies and its distribution in the VPA-type Bayesian model).*

This work is in progress and initial results were presented this year. STACFIS **recommends** that *the work continue in order to explore the possibility of using the results to calculate reference points. Other types of models should also be explored.*

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

With the income of recent good year-classes at low SSB it is not possible at the moment to define a SSB/R relationship.

This stock will be full assessed in 2020.

11. American plaice (*Hippoglossoides platessoides*) in NAFO Divs. 3LNO

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

STATUS: Work is ongoing.

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

STATUS: No progress on this recommendation; models that incorporate uncertainty in the catch are being explored.

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

Stock production models may be insensitive to drastic changes in survey indices in the most recent years, particularly if not associated with large changes in catch. STACFIS **recommends** *further investigation of the stock production model formulation used to assess this stock and/or alternate models that would be more responsive to the indices for the next full assessment of this stock.*

14. Capelin (*Mallotus villosus*) in Divs. 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.*

The next full assessment of the stock is planned for 2018.

15. Redfish (*Sebastes mentella and Sebastes fasciatus*) in Div. 3O

In 2016, STACFIS **recommended** that *for Redfish in Div. 3O, work continue on developing a recruitment index with sizes close to those recruiting to the fishery.*

STATUS: No progress has been made.

17. White Hake (*Urophycis tenuis*) in Divs 3N, 3O, and Subdiv. 3Ps

STACFIS **recommended** that *age determination should be conducted on otolith samples collected during annual Canadian surveys (1972-2016+); thereby allowing age-based analyses of this population.*

Otoliths are being collected, but have not been aged. STACFIS reiterates this recommendation.

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.*

No progress, STACFIS reiterates this recommendation.

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

No progress, STACFIS reiterates this recommendation.

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

Various formulations of a surplus production model in a Bayesian framework were explored and work is continuing.

The next full assessment of this stock is planned for 2019.

21. Northern Shortfin Squid (*Illex illecebrosus*) in SAs 3+4

In 2013, 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.*

STATUS: No progress has been made.

From the NAFO/ICES *Pandalus* Assessment Group (NIPAG) Meeting,
27 September to 3 October 2017

1. Northern shrimp (*Pandalus borealis*) on the Flemish Cap (NAFO Div. 3M)

For northern shrimp in Div. 3M NIPAG **recommended in 2016** that *further exploration of the relationship between shrimp, cod and the environment be continued in WG-ESA and NIPAG encourages the shrimp experts to be involved in this work.*

Status: In progress. Recent progress has been made, based on the work done by Pérez-Rodríguez, A. et al. (2016). Further progress will be reported under WG-ESA.

2. Northern shrimp (*Pandalus borealis*) on the Grand Bank (NAFO Div. 3LNO)

NIPAG **recommended in 2015** 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.*

Status: In progress. There was information presented to address this request at NIPAG in 2017, however, the work presented was applicable to NAFO Divisions 2J3KL as a whole. It was noted that during the 2016 June SC meeting that WG-ESA has included an item (ToR 6) endorsed by SC to develop ecosystem summaries for ecosystem units in the NAFO Convention Area. These summaries are to include provision of information for assessments at the ecosystem, multispecies, and stock level. It is anticipated that this information for 3LNO shrimp will be available considering that shrimp is a key forage species in the ecosystem. This recommendation is reiterated

3. Northern shrimp (*Pandalus borealis*) off West Greenland (NAFO SA 0 And SA 1)

NIPAG **recommended in 2012** that, *for northern shrimp off West Greenland (NAFO Subareas 0 and 1): given that the CPUE series for the Greenland offshore 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*

Status: Completed.

NIPAG **recommended in 2013** that *the relationship between estimated numbers of small shrimps and later estimates of fishable biomass should be investigated anew.*

Status: Completed (SCR Doc. 17/052 and SCR Doc.17/058)). The study showed a relatively good correlation between the number of age-2 shrimp and the fishable biomass 3 or 4 years later. Relationships should only be adjusted for autocorrelation, if found significant.

NIPAG **recommended in 2014** that *the structure and coding in the assessment model of the relationship between cod biomass, shrimp biomass and estimated predation should be reviewed, including an analysis of the error variation.*

Status: Completed. A correction to the coding of the model was implemented in the 2015 assessment, but further investigations of the treatment of the error variance is indicated (SCR Docs. 15/050 and 160/47).

NIPAG **recommended in 2014** *that further refinements to the "partial MIXing" method of estimating numbers at age should be explored.*

Status: In progress; this recommendation is reiterated.

Survey trends inshore and offshore are divergent and NIPAG **recommended in 2015** that *the nature and implications of this divergence is explored.*

Status: In progress; this recommendation is reiterated.

In 2016:

NIPAG **recommended** that *methods for prediction of future cod biomass should be explored.*

Status: Completed. In order to move from an 'expert judgment' of next year's cod biomass to be applied in the predictions of shrimp biomass in the following year, a linear regression approach was presented where biomass of an age-group was regressed against the biomass of the year-class in next year's survey. Based on these regression outputs, the prediction of cod biomass in the following year was derived (SCR Doc 17/059).

NIPAG **recommended** that *genetic stock structure in West and East Greenland should be further explored.*

Status: In progress; this recommendation is reiterated.

In 2017:

NIPAG **recommends**: *as information from the fishery indicates that catch sensors have been used for some time, the use of new technology which may influence the CPUE should be investigated and documented*.

NIPAG **recommends** that *the relationship between the pre-recruit index and the subsequent years' fishable biomass should be investigated further.*

NIPAG **recommends** that *the instability of the model should be explored.*

NIPAG **recommends** that *the P. montagui fishery should be explored further.*