



LDAC ADVICE IN PREPARATION FOR NAFO 40th ANNUAL MEETING
Tallinn (Estonia), 17-21 September 2018

Ref: R-02-18/WG2

Date of Approval by the Executive Committee:
6 September 2018

BACKGROUND / AIM OF THIS ADVICE

The meeting of the Scientific Council (SC) of NAFO, held in Halifax (Canada) from the 1st to the 14th of June of 2018, assessed the state of main commercial stocks in NAFO and as a result a table with recommendations for fishing opportunities for 2019 was established (see Table 1 below).

A LDAC delegation composed by the Chair, a Vice Chair, the Executive Secretary and 10 members of WG2 representing the concerned EU MS fleets with commercial interest in the fishery participated at a coordination meeting with the DG MARE lead negotiator and his team in Brussels on 23 August 2018. A presentation was given on the scientific advice for 2019 in relation to the main stocks for decision, as well as other conservation issues. The results of the NAFO Working Groups on Risk Based Management Strategies (RBMS); Bycatch, Discards and Selectivity (BDS); and Ecosystem Approach Framework to Fisheries Management (EAFFM), were also presented. Finally, an update on the performance review report was made.

At the meeting, the LDAC delegates hold a preliminary exchange of views in reaction to EU proposals. As in previous years, the LDAC committed to produce a written advice prior to the NAFO Annual Meeting and ideally in time for the Commission to be included in the presentation of its mandate before the Council, planned for 6 September 2018.

Through the present advice, the LDAC would like to make a number of clarifications for the awareness of DG MARE of the European Commission and the Fisheries Administrations of the Member States of the EU, based on the outcomes of the Scientific Council and relevant NAFO Working Groups, with a view to inform them for the forthcoming discussions within the 40th Annual Meeting of NAFO, to be held in Tallinn (Estonia) from 17-21 September 2018. The TACs and quotas for 2019 will be decided at that meeting, together with other management and conservation measures which are of relevance of the commercial fisheries for the LDAC members (both EU fleet and other interest groups incl. NGO) in NAFO RA.



Table 1. Scientific Council recommendations for fishing opportunities for 2019 on the stocks under the management of NAFO.

STOCK	ESTIMATED CATCHES 2017	TAC 2017	TAC 2018	Recommended TAC for 2019
Greenland Halibut 2+3JKLMNO	14 800	14 799	16 500	16 521
Cod 3M	13 928	13 931	11 145	20 796
Redfish 3M	7 177	7 000	10 500	10 500
Redfish 3LN*	11 815	14 200	14 200	18 100
Redfish 3O*	7 511	20 000	20 000	20 000
White Hake 3NO	512	1 000	1 000	1 000
Cod 3NO*	636	ndf	Ndf	ndf
American Plaice 3LNO*	1 172	ndf	Ndf	ndf
American Plaice 3M	157	ndf	Ndf	ndf
Witch Flounder 2J3KL*	100	ndf	Ndf	ndf
Witch Flounder 3NO	657	2 225	1 116	ndf
Capelin 3NO*	11	ndf	Ndf	ndf
Rays 3LNO*	4 463	7 000	7 000	4 000
Yellow Tail Flounder 3LNO*	9 203	17 000	17 000	24 900
Shrimp 3M*	0	ndf	Ndf	ndf
Shrimp 3LN*	0			ndf
Squid 3+4*	400	34 000	34 000	34 000
Alfonsino 6G	51			Tbd

Tbd = to be decided / ndf = no directed fishery (Moratorium on Fishing)

** Stocks assessed in previous years.*



SECTION I. STOCKS FOR DECISION IN 2019

The LDAC notes that the stocks for which SC has undertaken full assessments are:

- GHL Sub. 2 y Div. 3KLMNO (TAC 2019 HCR)
- Cod Div. 3M (TAC 2019)
- Redfish Div. 3LN (TACs 2019 y 2020)
- Witch Flounder Div. 3NO* (TACs 2019 y 2020)
- American Plaice Div. 3LNO (TACs 2019 y 2020)
- Yellowtail Flounder Div. 3LNO (TACs 2019 y 2020)
- Thorny Skate Div. 3LNO (TACs 2019 y 2020)
- Cod Div. 3NO (TACs 2019, 2020 y 2021)
- Capelin Div. 3NO (TACs 2019, 2020 y 2021)
- Alfonsino Div. 6G (TACs 2019, 2020 y 2021)

The following stocks have been assessed in previous years (in general, the review of data available in this meeting confirms the recommendations made in previous years):

- White hake Div. 3NOPs (TACs 2018 y 2019)
- Redfish Div. 3M (TACs 2018 y 2019)
- Witch Flounder Div. 2J3KL (TACs 2017, 2018 y 2019)
- Redfish Div. 3O (TACs 2017, 2018 y 2019)
- Squid SA 3+4 (TACs 2017, 2018 y 2019)
- American Plaice Div. 3M (TACs 2018, 2019 y 2020)
- Roughhead Grenadier Subarea 2 y 3

1. Greenland Halibut 2+3KLMNO

The new HCR was adopted by the NAFO Commission at the Annual Meeting in 2017 to calculate TACs for GHL in the Subarea 2 + Div. 3KLMNO. The HCR has two components used to calculate the TAC: one based on the biomass to be achieved (“target”) and the other on the trends shown by the surveys (“slope”).

The final annual TAC is the result of the mean average of the estimation of TAC from both “target” and “slope”, with the restriction of not allowing a TAC variation of +/- 10% between consecutive years.

LDAC Recommendation for GHL 2+3KLMNO

The LDAC is in conformity both with the HCR calculation method agreed for TAC and the resulting proposed TAC for 2019 of 16 521t.



2. Cod on NAFO Div. 3M (Flemish Cap)

The NAFO SC Benchmark assessment of the Flemish Cap (NAFO Div. 3M) cod stock took place in Lisbon on a meeting from 9-13 April 2018 analysing best commercial and scientific data from available surveys. The benchmark process resulted into the selection of the SCAA model from the four models analysed, three of them monospecific (Bayesian XSA, Bayesian SCAA, and SAM) and one multi-specific (based on GADGET).

The Bayesian SCAA model selected, considered the most robust and flexible in terms of data tuning, has shown a substantial change of perception of the stock size compared to previous evaluations, with greater stock abundance and biomass and a lower level of F. As a result, the new limit reference points have changed, SSB is now well above Blim (20 000t) and the SC recommends a catch of no more than 20 796t (this yield at $\frac{3}{4}$ Flim, that is now estimated at 0.153).

However, the LDAC notes with concern the relative low levels of recruitment estimated for recent years, and the dependence of the biomass in the year classes or cohorts from 2009-2011, with projections of a significant declines in stock size expected in the short-medium term.

In view of the above, in line with the precautionary approach and to achieve a proper balance between biological, social and economic sustainability, the LDAC would like propose a medium-long term approach which can take into consideration the forthcoming Management Strategy Evaluation (MSE) process for this stock in order to allow to set a correct baseline and flexibility mechanisms in the forthcoming years. This approach will also contribute to avoid huge fluctuations and set up a more stable framework which will bring predictability to the economic performance of the concerned fleets.

The LDAC also acknowledges the ongoing work of the Ecosystem Based Approach WG on species interactions and ecosystem productivity between cod, shrimp and capelin stocks, and encourages following this work in future years to develop consistent and robust models to inform managers and bring ecosystem considerations into the advice. In summary, stability in catches within the next 2-3 years must strike a balance with the future outlook of HCR under development, within the remit of the scientific advice from SCS and the PA framework, while assuming that exploitation patterns will not vary substantially and will remain stable to allow the SC to run tests on projections.



LDAC Recommendation for Cod NAFO Div. 3M:

In light of SCS recommendation of setting a level of catch of no more than 20 796t (yield at $\frac{3}{4}$ Flim) for 2019, the LDAC advises for an increase of the TAC (13,931t in 2018) which is consistent with the uncertainties and therefore is in the middle of the range between the previous TAC and the recommended one for 2019 (20,796t).

The TAC should be within the range of 17,000-18,000t for the following 2-3 years provided that current exploitation patterns remain targeting higher average size and higher age individuals/specimens; and with the caveat of introduction of additional measures such as more accurate reporting on catches, scientific surveys, etc.

The above mentioned approach will allow to introduce stability for the exploitation and predictability of catches from a socio economic point of view while targeting big individuals of 5+ year old and not hampering future recruitment. This proposal should be subject to annual review and aligned with the scientific advice coming from the MSE process which will be released from 2019 on.

3. Redfish 3LN

The catches of redfish here include two species, *Sebastes mentella* and *Sebastes fasciatus*, from the gender *Sebastes* known as “beaked redfish”. Both species are managed as one single stocks belonging to the population structure of the Northwest Atlantic redfish.

The outcomes of the scientific evaluation, based on the production model ASPIC, show that current biomass in 2018 is about 1.5times above Bmsy and has a very low probability (less than 1%) to be below Blim. The fishing mortality F is below Fmsy and also with a very low risk (less than 1%) of being above Flim.

The NAFO General Council adopted a management strategy based on a HCR establishing a progressive increase of catches every two years between 2015 and 2020. As a result, the biannual TAC adopted for 2018 and 2019 is 18,100t.



LDAC Recommendation for Redfish 3LN:

The LDAC recommends to follow the scientific advice and follow the HCR in place until the next stock assessment is available. It also notes the importance of this stock for some EU Member States, in particular Baltic States and Germany, which fully utilise their quota, and for Portugal with high level of catches also reported in 2017 (2 671t). For this reason, the LDAC is of the opinion that these countries should not be penalised or have detrimental effects on the TAC due to the underutilisation of the quota by other CPCs such as Canada which are welcome to establish an internal system to limit their own quotas or allow some flexibility for quota reallocation or swaps.

4. Redfish 3M

The LDAC reminds that, at the last NAFO annual meeting, the TAC was increased from 7 000t to 10 500t for 2018 and 2019. The SC says on its report that "*the perception of the stock status has not changed*".

LDAC Recommendation for Redfish 3M

In view of this, the LDAC supports to follow the scientific advice of catch not exceeding 10 500t, and does not consider necessary to revisit the biannual TAC approved in 2017 for 2018-2019 until the release of a new stock assessment by the SC foreseen for 2019.

5. Witch Flounder 3NO

The stock was reassessed in 2018 under Scientific Council's own initiative. Catches in 2017 were 657t, well below the TAC but have increased and in the four first months of this year catches amount already to a 60% of the TAC and the projections indicate that the full quota will be likely reached before the end of the year.

In the previous evaluation Blim was set at 15% Bmax, but now the SC considers that this value is not an appropriate reference point for this stock, and has changed it to 30% Bmax.



A Bayesian surplus production model was adopted to evaluate this stock taking into consideration the commercial catches and the Canadian surveys from spring and autumn.

The results of the evaluation show an increase of SSB from 1999 to 2010, followed by a decrease from 2012, being currently around 37% of $B_{msy} = 60,000t$. The scientific advice has been revised this year with new data despite not being scheduled a new full analytical assessment. As a result, there is a risk of 29% of falling below Blim and 4% that F is above Flim. Recruitments based on surveys have been relatively low since 2013 and the last 2017 YC is within the historical mean of the series.

Regarding future outlook, an assumption that catches in 2018 were equal to the TAC of 1,116t was made for all F scenarios projected ($F = 0$, F_{2017} , $2/3F_{msy}$, $85\%F_{msy}$ and F_{msy}). The probability that $F > F_{lim}$ in 2018 is 30% at a catch of 1 116 t. The probability of $F > F_{lim}$ in the projected years ranged from 7 to 50% for the catch scenarios tested. Regarding the probability of B being below Blim in 2021, ranges from 15% and 24% amongst all the tested scenarios. According to the PA framework, it is specified that there must be a very low probability of being below Blim. The SC has established this very low probability as less than 10% risk, and recommended that there be no directed fishing in 2019 and 2020 to allow for stock rebuilding. It should be noted also that a new Limit Reference Point (LRP) was set for Witch Flounder in NAFO Divs. 2J+3KL (SCR Doc. 18/30) and that this fishery will continue be closed.

LDAC Recommendation for Witch Flounder 3NO

The LDAC notes the recommendation from SC but also takes consideration to the fact that the population is projected to grow under all scenarios and the probability that the biomass in 2021 is higher than the biomass in 2018 is greater than 60% in all scenarios.

In view of the above and in order to ensure a balance between biological and socio-economic sustainability for this stock, the LDAC recommends to maintain fishing activity at low levels until there are guarantees and higher probability of recovery of SSB above Blim. The LDAC notes that the introduction of a moratoria under the conditions laid out in art 6.3 of 1,250 kilos or 5% of catch (whichever is higher) could end up in a higher level of catches than the current TAC, set in 1,100t. It must also be noted that the current level of catches is around 650-680t. The LDAC encourages to improve data reporting on total removals including catches and discards.



6. American Plaice 3LNO

The stock was assessed on an ADAPT VPA model tuned with information from Canadian spring and autumn surveys as well as an EU-Spain survey on Div. 3NO. The results show that the SSB has slightly increased in recent years but remains quite low at 34% of Blim set in 50,000t. Recruitment from year 5 have been relatively low since the 80s. Current F is low and is below Flim = 0.31. There is no direct fishing.

LDAC Recommendation for American Plaice 3LNO

Given that there is no change of perception in the state of the stock and that the biomass remains well below Blim, the LDAC supports to follow the advice of the Scientific Council that there should be no directed fishing in 2019, 2020 and 2021, in accordance with the recovery plan for this stock.

7. Yellowtail Flounder 3LNO

In 2017, STACFIS recommended 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.

As a result, this stock was assessed by a Bayesian surplus production model for first time. This model reflects more accurately the data collected in the surveys. The stock size has steadily increased since 1994, in particular between the period 1994-2000, and has remained at stable levels up to now, being at present 1.5 times Bmsy. There is also a very low fishing mortality at different scenarios up to 85% Fmsy, corresponding to catches of 24 900t, 22 500 t and 21 100 t in years 2019, 2020 and 2021, respectively. This results in a risk below 30% of exceeding Flim and a probability higher to 80% of maintaining the stock above Bmsy. There is a very low (<1%) risk of the stock being below Bmsy or F being above Fmsy. Recent R appears to be higher than the average.

Catches of yellowtail flounder have been well below TAC in recent years. In 2017 the TAC was 17 000t and the reported catches were only 9 203t. The quota of this stock is shared between Canada who has the 97.5%, and St. Pierre et Miquelon with a 2%. According to the Statlant 21, Canada's declared in 2017 catches of 6 172t and St Pierre 280 t. Also Japan declared catches for 1 000 t and USA 782t, both receiving small cessions of quota from Canada.



The stock occurs in Divisions 3LNO, mainly concentrated on the southern Grand Bank so management decisions on this stock should also take into consideration impacts on other fisheries. Increased catch of yellowtail flounder may increase by-catch of Div. 3NO cod and Div. 3LNO American plaice.

Currently, the biomass is estimated to be above Blim; and F is estimated to be below Flim (=Fmsy). The stock is in the safe zone as defined in the NAFO Precautionary Approach Framework. The next assessment is planned for 2021.

LDAC Recommendation for Yellowtail Flounder 3LNO

The LDAC recommends to follow scientific advice and keep the TAC according to the level of catches for this stock.

8. Thorny Skate 3LNO

This stock is subject to a qualitative assessment based on information from commercial catches and survey trends, having a high degree of uncertainty. The assessment shows the lowest F value of the whole time series. The recruitment seems to grow above the average and the stock biomass stable in last years (2013-2017) above Blim (probability of over 95%) with present catch levels of 4060t.

The total declared catches of thorny skate in 2017 were of 4,463t for a TAC of 7,000t. This difference is mainly due to the lack of activity of Canada and Russia, which have each a 17% of the total 3LNO skate TAC and that were not active in the fishery. The same year in Subdiv. 3PS, presently managed as a separate unit by Canada and France in their respective EEZs, Canada reported catches of thorny skate of 413t while St Pierre et Miquelon reported 192t.

Notwithstanding the above, given the low resilience and the high vulnerability of this stock to fishing exploitation, the SCS advises *no increase in catches*.



LDAC Recommendation for Thorny skate 3LNO

The LDAC supports the advice from Scientific Council for the 3LNO portion recommending "*no increase in catches*", but warns that this should not be interpreted in the sense of reducing the TAC and penalizing as a result those CPCs that are catching their quota. The LDAC reminds the importance of this stock for some EU MS, in particular Spain, which fully utilise their quota. This is the reason whereby individual MS should not be penalised or have detrimental effects on the TAC due to the underutilisation of the quota by other CPCs. The LDAC encourage SCS to collect additional data to improve quality and reliability of the stock assessment in future.

9. White hake 3NO

The management unit for this species is 3NO although it is also distributed in Subdivision 3Ps. This stock has a qualitative trend-based assessment drawn from surveys and catch indexes. The biomass for this stock remains at low levels and there have been no good recruitments since 2000. The fishing mortality remains low. The LDAC reminds that this is a species whose presence is highly seasonal, depending mainly on its recruitments, it is of interest to set a TAC that may cater for accidental catches in other fisheries.

LDAC Recommendations for White Hake 3NO

Given the absence of new scientific information and the low recruitment, the SC recommended last year that TAC should be maintained at the same level as last year's, namely 1,000 t. In view of the overall sustainable level of catches around 500t coupled with the complexities of allocation keys for TAC between CPs, the LDAC supports the present TAC at 1,000 t.

10. Cod 3NO

The assessment model approved for this stock is ADAPT, and provides consistent results with previous years' assessments. The SSB has increased between 2010 and 2015, but has decreased in recent years despite low fishing mortality levels below $F_{lim} = 0.3$. In 2018 the SSB is estimated to be at 18 500 t, representing 31% of B_{lim} (60 000 t). In terms of recruitments, the stock size is heavily relying on the cohort from 2006.



LDAC Recommendation for Cod 3NO

In view that low F does not seem to reflect into the recovery of the stock, the LDAC to adopt a precautionary approach and supports the SCS recommendation of no directed fishing for the period 2019-2021 in order to allow recovery of the stock.

11. Capelin 3NO

The evaluation of this stock is done through a qualitative assessment and trends based from an acoustic survey (1975-1994) and, in recent years, by bottom trawl surveys (1995-2017). However, the latter ones are not reliable for evaluating a pelagic stock, so results are only indicative. Acoustic surveys show that stock is at quite low levels of biomass.

LDAC Recommendation for Capelin 3NO

The LDAC supports SC advice of *no directed fishing for the period 2019-2021*.

12. Northern Cod 2J3KL

The LDAC notes with concern the situation of this stock, mostly caught within the Canadian EEZ, and expects that Canada reduces fishing pressure within its EEZ.

The EU should look to the evolution of the catches in this area closely. Not only has Canada not refrained from fishing in these areas of the RA, but the catches there SEEMS to have continued to increase year after year.

Canada has been fishing more than 4.000 tons/year since 2013. In 2016 it reported 9,645 tons in 2J3KL. Also, one of the theories about the reasons of dwindling population of Cod in 3M is the displacement of the fish towards 3KL, a displacement caused by environmental change but probably also due to the increased seismic vessel activity and increased mineral exploitation of the bottom and oil drilling.

The existing agreement between Canada and the EU on the sharing of TAC in that area elapsed in 2005, but the EC should explore the possibilities to fish on those areas based on past track records and considering that this could be a good compensation for the possible reduction of fish in the Flemish Cap due to the new human activities in the area.



LDAC Recommendation for Cod 2J3KL

The LDAC reiterates its advice from last year, i.e. it is imperative that the EC, together with other CP, begin the process of obtaining fishing possibilities in the 2J3KL areas in line with past track records and the existing fishing activity in the area. The LDAC would like the EU to ask for data and reporting by Canada on the seismic, mining and oil drilling activity that are currently going on in that area.

13. 3M Shrimp

The LDAC reiterates the high importance and commercial and socioeconomic value of this stock for the Baltic States, which had before the moratorium set in 2010 around 350 people employed, and an estimated revenue between EUR 80-150 million annually

The LDAC notes that Blim in 2018 is just above levels of 1994, when catches were reported to be around 24 000t. Looking at following years, it increased considerably to 67 000t. In view of this, the LDAC does not agree with the advice from SC on keeping the moratorium until 2019 because of limited effort data. Instead, it would like to propose a reopening of the fishery with a limited number of days to obtain catch data to improve analytical input to the scientists. The Estonian and Lithuanian fleets which are members of the LDAC have suggested setting between 100 and 150 days for a number of selected vessels per year divided in quarters and by areas, with a dedicated data collection programme associated.

The LDAC appreciates that the EU makes annual surveys for shrimp in areas 3L and 3M. However, it notes with concern that, in terms of calendar of provision of advice, these shrimp stocks are only assessed in October in a Joint meeting NAFO-ICES WG.

LDAC Recommendation for Shrimp 3M

In view of the socioeconomic importance and value of this stock for the Baltic States, the LDAC would like to ask the EC considering proposing a partial reopening of the fishery in 2019 to improve catch and effort data, with an adequate collection programme associated to those commercial vessels which are selected. The LDAC recommends around 100 days per year divided in quarters and by areas.

The LDAC also asks that the Joint ICES-NAFO Working Group that deals with the assessment of this stock meets earlier in time from October to late August/early September so the advice is ready to be presented at the NAFO Annual Meeting and a timely and informed decision can be taken there.



14. Splendid Alfonsinos in Div. 6G

The LDAC notes the absence of information and reliable stock assessment and information on population structure due to lack of abundance and exploitation data for these stocks. As a result, the SCS has assumed that each seamount is an individual stock.

Alfonsino aggregations were discovered by Russians in the mid-70s in three seamounts of Corner Rise. Two of them fall within the scope of NAFO RA, namely Kukenthal and C-3. The third one, Milne Edwards is located in the West Centre Atlantic. There is fishing activity from one Spanish boat currently in the Kukenthal Seamount, with catches being exported to and commercialised in Russia.

The SCS has been unable neither to provide an analytical assessment nor based on surveys. As a result, it has not been able to advise on an appropriate TAC for 2019, 2020 and 2021.

LDAC Recommendation for Alfonsinos in Div. 6G

In the absence of any new scientific information, the LDAC supports the recommendation made by the SC in 2016 on not allowing the expansion of fishing above current levels on Kukenthal Peak unless proved sustainable. And setting the limit on 100t to allow continuing fishing activity of the Spanish vessel which is currently active in the fishery.

Furthermore, while being aware of the pressure on the Scientific Committee to evaluate several stocks and the need to prioritise stocks in accordance with the recommendations of the recent NAFO performance review, a full assessment would be advised to be carried out in the future for this stock.



SECTION III. WORK PROGRESS OF NAFO WORKING GROUPS

1. NAFO Working Group on Bycatch, Discards and Selectivity (WG BDS)

The SC discussed the Action Plan to minimise by-catches and discards developed by the WG-BDS and noted that most of the SC related items will be worked on over the next few years; and also acknowledged the work that has been done in the past on this subject.

The LDAC regrets that Norway was not present at the WG-BDS this year to contribute on discussions related to improve knowledge on discards and study the impact of implementation of landing obligation in Europe and other areas. This is particularly surprising insofar as this topic was put forward on a motion made unilaterally by this country (CPC) at the last NAFO Annual Meeting with the view of considering its inclusion under the remit of this Working Group.

The LDAC acknowledges that the levels of reported discards in NAFO RA seem to be low, within the region of 3% in average. It seems that the actual rules on NAFO CEM regarding by-catches and discards are efficient and additional studies should be undertaken before considering moving to alternative measures which might be counterproductive for the fishing activities if not adequately evaluated a priori.

LDAC Recommendation for Work of NAFO WG-BDS

The LDAC supports the position presented by the EU at the last technical coordination meeting with the LDAC, which is focused on tackling challenges of implementation of existing NAFO Action Plan on minimizing discards rather than created a whole blanket approach as proposed initially by Norway. In particular, the LDAC identifies the following areas to work on: improving haul by haul catch data; streamlining ways to engage fishers and stakeholder to provide more information on the reasons for discarding (species, areas, etc.); and carrying out impact assessments on potential measures that might go beyond the existing framework.



2. NAFO Working Group on Ecosystem Approach to Fisheries Management (EAFM)

2.1. Implementation of Ecosystem Approach - Road Map

NAFO's ongoing work on an ecosystem road map and efforts to identify total productive capacity of the ecosystem represent the leading edge of RFMO efforts to move towards an ecosystem approach to management.

Given the decline of the primary zooplankton species and the nutrient standing stock by 40% since 2011, it is advised that NAFO takes into consideration the ecosystem considerations when discussing management measures on NAFO stocks, including fishing possibilities.

NAFO has been praised by the experts' panel drafting the performance review as being one of the most advanced RFMOs in terms of protection of VMEs and research related to ecosystem considerations to be integrated into fisheries management. In this sense, the LDAC is following with interest the discussions within this WG on ecosystem productivity and interactions between species.

The SC pointed out that the Total Catch Ceilings (TCC) by ecosystem provide information for strategic management at the ecosystem level, which may be complementary to advice at the stock level. The SC affirms that once TCC can be estimated with sufficient reliability and precision, they should provide an ecosystem vision that allows the evaluation of recommendations that arise from the stocks and serve to address questions that are not considered as part of the evaluation of a single species.

The SC asks the Commission to consider the development of different options with which ecosystem considerations can be integrated into the management of fisheries, taking into account the risk of damage of the ecosystem. The SC also recommends to set up an ad-hoc COM-SC working group, composed of a subgroup of WG EAFM members, to identify mechanisms through ecosystem considerations could be integrated into fisheries management.



LDAC Recommendation on Implementation of Ecosystem Approach – Road map

The LDAC notes and welcomes the progress made by the WG EAFFM and SC in developing a road map to explore methods and models to integrate ecosystem considerations into fisheries management.

However, the LDAC warns that there is still a high degree of uncertainty in the methodology and models still need to be tested before introducing this new concept of “*Ecosystem productivity*” into the field of fisheries management. A robust model need to be built before putting into place effective measures which can make false assumptions in relation to the notion of overexploitation of fishing resources.

2.2. Impact of Oil and Gas activities in the Ocean

The LDAC would like to encourage the EU to keep up with the very positive work acting as promoter to develop this subject at NAFO since 2014; and continue instigating NAFO fellow CPCs, in particular Canada, to provide detailed impact assessments related to activities other than fishing when designing VME closures. The LDAC would like to remind the commitment made by Canada at last Annual Meeting to provide the relevant environmental assessment information at the forthcoming Annual Meeting.

LDAC Recommendations on Impact of Extractive (Oil and Gas) Activities in NAFO RA

The LDAC would like to ask the EU to push for further interagency cooperation and improvement on information exchange systems amongst relevant Canadian authorities and departments with competencies on these areas is a key aspect of it. Also, further engagement with relevant Canadian and non-Canadian/international stakeholders should be promoted to ensure transparency and good governance.

Furthermore, the LDAC would like to see that any environmental impact assessment carried out in NAFO RA should also include specific research on impacts of anthropogenic noise on marine life pollution at sea in international waters. Ocean noise is recognized as a world-wide problem affecting many species and bibliometric analysed showed rapid growth and diversification of ocean noise research in the last decades. This has also become an international commitment taken by all NAFO CPCs on several international fora and included on UN conventions and resolutions.



2.3. Impact of bottom fisheries and scientific surveys on Vulnerable Marine Ecosystems (VMEs)

The SC reported that analyses related to the EU surveys were not carried out in 2017 due to workload, but the intention is to complete this task prior to the next SC meeting in June 2019 assuming necessary resources are made available.

SC is unknowing of monitoring plans and sampling methods for VMEs (other than trawls), therefore the Commission may wish to consider possible options for non-destructive regular monitoring within closed areas.

SC reiterates its recommendation in 2017 that scientific bottom trawl surveys in existing closed areas be avoided if possible and additional work be conducted as soon as possible to further evaluate the implications of excluding surveys in closed areas on stock assessment metrics.

As in previous years, the LDAC would like to reinforce its recommendation to assess the overlap of fisheries with VMEs, in order to improve the knowledge on fishery specific impacts as proportion of the area. This has already been discussed at the 2016 WG on Ecosystem Approach Framework to Fisheries (WFEAFFM). It is further considered useful to work on studies regarding functional SAI (seriously adverse impact assessments) criteria, to include in the assessments parameters such as resilience and links with fisheries.

The SC have made considerable progress in studying the overlap of the different NAFO fisheries with the Vulnerable Marine Ecosystems (VME), based on logbooks and Haul by Haul data. In order to make an accurate estimate of the swept area, the SC considers necessary to have the fishing gear data of open access by the NAFO Observers.

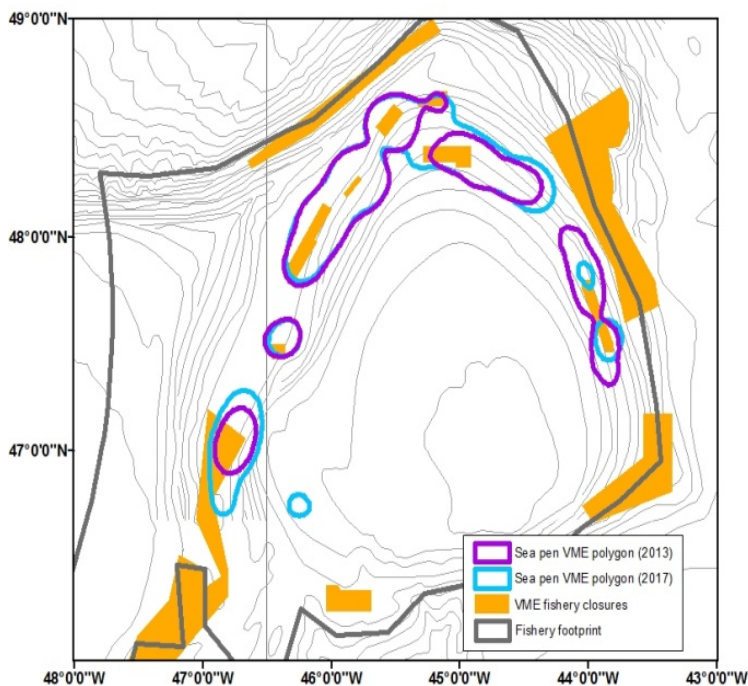
The SC has also made progress in the development of models and methodological approaches that evaluate the functional importance of VMEs and the estimation of recovery rates of different VME indicator species. The work is continuing before the re-evaluation of the closures that will take place in the year 2020.

LDAC Recommendation on Impact of Scientific Surveys on VME in closed areas

The LDAC is concerned with the implications of excluding surveys in closed areas on stock assessment metrics, resulting in the lack of scientific data and assessment available to measure the effectiveness of designated VME. The LDAC agrees with the purpose and rationale of the VMEs on minimising impacts of protected features in closed areas but would like to see proper alternative methods in place to develop regular monitoring plans and sampling methods within closed areas for VME (other than trawls) by scientific surveys which offer an equivalent amount and quality of data and that is easily implementable.

2.4. Sea Pen Closures in Area 14 (Eastern Flemish Cap) in Div. 3M

The LDAC reminds that the proposed closures of fishing in Areas 13/14 for Sea Pens will expire at the end of 2018. The WG ESA carried out an updated analysis of the biomass and distribution of the sea pens in this area. The Figure below shows the results for the year 2013 (purple) and the results updated for the year 2017 (blue). The SC concluded that there is very little change in the overall distribution of sea pen VME found on the eastern area of the Flemish cap (Area 14).





LDAC Recommendation on Sea Pens closure in Areas 13/14

The LDAC is pleased to see that SC have carried out an study on the effectiveness of the sea pens closure in area14 in terms of protection of these features (biomass and distribution), as requested in previous advice from 2016 and 2017. In light of the findings, which seem to indicate that sea pens are more resilient to fishing activities than initially considered, the LDAC would like to ask the EU to considering proposing not maintaining these closures beyond the allocated period time.

3. NAFO Working Group on Risk Based Management Strategies (WG-RBMS)

3.1. Development of a Protocol for Exceptional Circumstances for Greenland Halibut Management Strategy Evaluation

The Scientific Council addressed in its report all the questions posed in the RBMS report from September 2017. In some cases they have provided specific guidance, e.g. on the definition on exceptional circumstances on how to determine ceilings or trigger points as indicators with the caveat of expert judgment to be applied on a case-by-case basis. It is also worthwhile to reflect that separate consideration was given of annual monitoring versus assessment-based indicators.

LDAC Recommendation on GHL MSE

The LDAC agrees with the criteria and methodology set up by the SC and notes that the management objectives are coherent with those include on the GHL MSE with exception of the risk for keeping the slope of decline due to biggest variations in cod. The main issue will be on the implementation process of the exceptional circumstances if they declared. Managers should be able to assess the level of risk to assess the state of the stock before activating the protocol to avoid uncertainty to fishing operators.



SECTION IV. OTHER REQUESTS MADE TO NAFO SCIENTIFIC COUNCIL

1. Greenland Shark: Biology and management advice

The SC reviewed the available information on biology, distribution and catches for this species. Due to the shark's longevity and its biological characteristics, the SC recommends that the retention and landings of this species be prohibited, through live release of Greenland sharks caught and promotion of safe handling practices.

Measures to improve the collection of shark data by fishery observers in all fisheries in the NAFO Convention Area is also recommended.

Furthermore, the SC suggests that management measures be implemented to reduce the incidence of the by-catch of Greenland sharks. Finally, it recommends that management measures should keep fishing mortality as close to zero as possible, to ensure a low probability that biomass will decrease in the near future.

LDAC Recommendation

The LDAC agrees with the overall SC approach for the protection of this emblematic long-lived shark species. The LDAC supports a ban on landings and retention on board for this long lived species, as well as protocols for safe handling practices and release of sharks to ensure survivability of this long lived species. It also supports further scientific research for improving knowledge and data collection related to biology and migration patterns for this species, including spawning areas. The LDAC notes that interaction with this species occurs mainly in areas within the EEZs more than outside the 200 nautical miles.

2. Review of Precautionary Approach (PA) Framework

The SC reported that there has been no progress since the review of the PA framework in September 2017. Due to the heavy workloads and limited capacity, the Scientific Council will be unable to complete this review by September 2018 and encourages participation of additional quantitative experts in an effort to make progress.

As a general comment, the LDAC is concerned of the increasing pressure and work overload of the Scientific Council put by NAFO General Commission in recent years, and encourages the EU to ask for progressing on prioritization of tasks entrusted for the work of the SC while ensuring that adequate and sufficient resources are put by NAFO Secretariat and CPCs.



LDAC Recommendation on Review of PA Framework

The LDAC considers as very important to complete the SWOT analysis initiated by the SC in 2017 with the view of developing a strategic scientific plan with medium and long-term objectives. This process should be done by the SC in conjunction with the NAFO General Commission.

3. Control and Compliance Aspects – STACTIC

The LDAC would like to raise a complain about the lack of availability of STACTIC Working Group reports and the omission to stakeholders of several key technical documents which are necessary for carrying out a proper reflection and comments on the final STACTIC report. Although the LDAC understand the decisions made by STACTIC members and CPCs to maintain confidentiality for the case of non-compliance reports incurred by individual vessels, we cannot agree with the non-sharing of 18 technical working papers mentioned at the STACTIC general report.

LDAC Recommendation

The LDAC recommends that a preliminary and structured consultation procedure is set up for all identified concerned fleets and/or stakeholders affected by technical measures adopted during STACTIC Working Group meetings which might have a direct effect on the fishing activities at the fishing grounds. The LDAC encourages that the EU supports the US proposal to bring more transparency of the internal working of STACTIC and asks that technical reports can be shared on proposals for changes to NAFO CEM of technical nature with designated or identified key stakeholders, while ensuring confidentiality of sensitive information.

4. NAFO Performance Review

The LDAC welcome the openness of the European Commission in actively involving our organisation in the consultation on the NAFO performance review from the experts' panel addressed to CPCs which took place in the first quarter of 2018. We are pleased to see that the LDAC was able to provide a meaningful contribution to the EU that could be integrated in their work on this subject.



As a reminder, the LDAC submitted a number of recommendations related to streamlining encounter protocols of VMEs outside closed areas and also improving impact assessments of VMEs that have been closed to bottom trawling. It also noted that improvements needed to be done in terms of adopting relevant protection measures for deep sea sharks.

Overall, the LDAC is satisfied with the reflections and proposals arising from the NAFO performance review, noting the following features:

- NAFO is one of the most advanced RFMOs in terms of work related to protection of VME and work on developing a precautionary approach framework.
- Scientific Council capacities must be reinforced and consultations made by managers/policy makers need to be properly prioritised to avoid overloading of tasks.
- Some identified future challenges for the organisation are minimising pollution and waste management, avoiding catches of endangered species, measuring accumulative impact of other industries and all operations in NAFO regulatory area.

Last, the LDAC is missing in the experts' panel report specific recommendations on how to improve communication and information exchange on impact of oil and gas activities for VMEs and fishing species in NAFO RA.

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