



LDAC ADVICE FOR NAFO 42nd ANNUAL MEETING Video Conference due to COVID-19, 21-25 September 2020

**Ref.: R-11-20/WG2
Date: 15 September 2020**

BACKGROUND / AIM OF THIS ADVICE

The meeting of the Scientific Council (SCS) of NAFO, held by correspondence due to COVID-19 pandemic from the 28th of May to the 12th of June of 2020, assessed the state of main commercial stocks in NAFO and as a result a table with recommendations for fishing opportunities for 2021 and 2022 was presented (see table 1 below).

A LDAC delegation composed by the Chair, a Vice Chair, the Executive Secretary and 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 24 August 2019. A presentation was given on the report of the Scientific Council and its advice for 2021 and beyond in relation to the main stocks for decision, as well as other conservation issues.

At the meeting there was also a short reference made to the work of several NAFO Working Groups, namely: Risk Based Management Strategies (WG RBMS); Ecosystem Approach Framework to Fisheries Management (WG EAFFM); and Bycatch, Discards and Selectivity (WG BDS). Specific emphasis was given to the progress made by the EAFFM on the development of an ecosystem approach roadmap and its associated level objectives, including a multispecies assessment.

At this preparatory meeting, the LDAC delegates held a preliminary exchange of views in reaction to EU proposals, with the Secretary conveying the main recommendations for each stock and the members adding their qualitative expertise and knowledge. As in previous years, the LDAC committed to produce a written advice prior to the NAFO Annual Meeting.

Through the present advice, the LDAC would like to make a number of recommendations addressed to the negotiating team of DG MARE on behalf 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 WGs. A LDAC delegation will also participate at the Annual Meeting, aiming to inform the European Commission negotiating team during the forthcoming discussions to be held at the 42nd NAFO Annual Meeting.



The fishing opportunities for 2021 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.

For comparative analysis purposes, below is a summary table containing TACs approved for 2019 and 2020, as well as the level of catch in terms of quota consumption in 2019 (best data agreed at CESAG combining DCR, port inspection reports for all stocks and countries and STATLANT 21A for Canada catch within its EEZ). It also contains the recommended TAC made by the Scientific Council for 2021.

Stock	Estimated Catch 2019 (t)	TAC 2019 (t)	TAC 2020 (t)	Recommended TAC for 2021 (t)
Greenland Halibut (GHT) 2+3JKLMNO	16 481	16 521	16 926	16 498
Cod 3M	17 520	17 500	8 531	1 000
Cod 3NO*	526	ndf	ndf	ndf
American Plaice 3LNO*	1 248	ndf	ndf	ndf
American Plaice 3M	302	ndf	ndf	ndf
Witch Flounder 3NO	863	1 175	1 175	ndf
Redfish 3M*	10 469	10 500	8 590	4 624
Redfish 3LN	13 050	18 100	18 100	18 100
Redfish 3O*	6 526	20 000	20 000	tbd
White Hake 3NO*	304	1 000	1 000	406
Capelin 3NO*	2	ndf	ndf	ndf
Thorny Skate / Rays 3LNO	3 697	7 000	7 000	3 511
Yellow Tail Flounder 3LNO*	12 837	17 000	17 000	21 100
Squid 3+4 (3LMNO)*	1 085	34 000	34 000	34 000
Alfonsinos 6G*	1	ndf	ndf	ndf

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

** Stocks assessed in previous years.*



SECTION I. STOCKS OF INTEREST FOR DECISION IN 2021

The LDAC notes that the stocks for which SCS has undertaken full assessments with its respective levels of TACs determined for this year are:

- GHL Sub. 2 y Div. 3KLMNO (TAC 2021 applying the HCR)
- Cod Div. 3M (TAC 2021)
- Redfish Div. 3LN (TACs 2021 applying the HCR)
- American Plaice Div. 3M (TACs 2021, 2022 and 2023)
- Thorny Skate/Rays Div. 3LNO (TACs 2021 and 2022)
- Witch Flounder Div. 3NO (TACs 2021 and 2022)

The following stocks have been assessed in previous years with advice for 2020 and the recommendations made have been updated and reviewed in light of the new data available:

- American Plaice Div. 3LNO (TACs 2019, 2020 and 2021)
- Yellow Tail Flounder Div. 3LNO (TACs 2019, 2020 and 2021)
- Cod Div. 3NO (TACs 2019, 2020 and 2021)
- Capelin Div. 3NO (TACs 2019, 2020 and 2021)
- White hake Div. 3NOPs (TACs 2020 and 2021)
- Redfish Div. 3M (TACs 2020 and 2021)
- Redfish Div. 3O (TACs 2020, 2021 and 2022)
- Squid SA 3+4 (TACs 2020, 2021 and 2022)
- Alfonsinos Div. 6G (TACs 2020...)



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.

As a result, the HCR calculation method agreed for TAC and the resulting proposed TAC for 2020 was of 16 926 t.

The LDAC acknowledges that the HCR has brought stability into the management system since its application in January 2018. The SCS recommends for 2021 a slight decrease of 2.5% in the TAC in 16,498t.

It is also worthwhile to mention that the SCS notes that there have not been any limiting factors to trigger the application of the "*exceptional circumstances*" so the HCR can be therefore fully implemented without bias or corrections.

LDAC Recommendation for Greenland Halibut 2+3KLMNO

- **The LDAC considers that the HCR are proving effective in providing stability to the management of this fishery and is conform with the SCS advice establishing a TAC of 16,498 t for 2021.**
- **The LDAC also wishes to note that "*exceptional circumstances*" are not occurring.**



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

The LDAC acknowledges the scientific advice which indicate a substantial decline in stock size of this stock due to poor recruitments since the last strong year class in 2011. The LDAC notes with concern that the SC states in its recommendation for 2021 that, for any catch over 1 000 tonnes, the probability of being below Blim exceeds the NAFO PA guidelines ($\leq 10\%$ of SSB being below Blim and of exceeding Flim).

The recommendation of a TAC of 1,000t for 2021 means in practice and economic terms a dramatic reduction of catches from near 17000 t to close to zero in only two years (TAC of 17 500 t in 2019 and 8500 t in 2020).

The LDAC strongly rejects any proposal for a moratorium of this fishery, which would render the fishery closed effectively for at least 4-5 years and would have draconian consequences for the socio-economic viability of demersal EU fleets, in particular demersal trawlers from Portugal and Spain. The LDAC reminds that the last moratorium lasted for 15 years and had little consequences in the improvement of the stock. The LDAC reminds that environmental factors are playing a major role in the poor recruitments observed in the last decade in the Flemish Cap.

Furthermore, there seems to be a certain degree of discrepancy between scientific estimation on their surveys and commercial data and skippers' feedback with regards to mean length size and age distribution. While SC says that size has increased from 45 to 60 cm in commercial reports and a prevalence of big individuals of 6+ years in the catch composition, skippers operating in the area are reporting an increase in catches of juveniles (0-2 years) in the first months of the year. It must be noted that, according to SC, the current SSB is estimated to be above Blim (15,271t) although it is declining rapidly and F in 2019 increased to a level above Flim (median 0.191).

In this respect, the Portuguese trawl industry targeting cod in NAFO has suggested establishing a TAC of 5,595t based on the following reasons:

- Apply the same criteria than last year and select from the catch options table the one related to $F_{bar}=3/4F_{lim}$.
- Mitigate the socio-economic impact of fixing a decrease of TAC more than 50% from one year to another, which would render the fishery not profitable.
- Take into account the last summer (August) scientific campaign, which shows a substantial increase of the biomass with 67,095t in comparison with the 48,777t included in the SC report published earlier in June 2020.



The LDAC acknowledges the dire strait situation of this stock. In order to mitigate the impact of trawl activity, rebuild the biomass and protect future recruitments, we would be in favour of adopting the following technical measures in addition to the allotted TAC:

1. The organisation by NAFO, as recommended by SC since 2015, of a scientific protocol with a sampling plan to carry out a selectivity trials for testing the effectiveness and impact of the use of sorting grids in the reduction in catches of juvenile and small cod. Such programme should have a standardised methodology that can be validated for analysis of results by SC.
2. Depending on the outcome shown by the scientific trial on the effectiveness of the sorting grids in improving gear selectivity, consider the option of including the use of the sorting grid for all demersal trawlers targeting cod operating in NAFO RA in 2021. This should be feasible insofar as all EU trawlers targeting cod (and most non-EU including Russia) have already implemented and are using this grid in Norwegian EEZ waters, Svalbard FPZ and the Barents Sea; and they have proven their positive impact on the reduction of catches of juveniles.
3. The adoption of a spatial/temporal closure for the entire Subdivision 3M from January to March 2021 to protect spawning aggregations of Cod, with fishing activity on cod allowed from April to December each year. There should be also the possibility to define/revise the specific areas where this closure should be more effective, similarly as it has been done in Iceland and the Barents Sea cod fisheries.

Regarding the benchmark process for a long-term approach, the LDAC recalls that NAFO SCS 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 SCSAA model from the four models analysed (XSA, SCSAA, SAM, GADGET).

In line with the precautionary approach and to achieve a proper balance between biological, social and economic sustainability, the LDAC would like to reiterate its proposal in adopting a robust medium-long term approach which can take into consideration the 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 between years and set up a more stable framework which will bring more 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 must strike a balance with the future outlook of HCR under development, within the remit of the scientific advice from SCSS and the PA framework, while assuming that exploitation patterns will not vary substantially and will remain stable to allow the SCS to run tests on projections.

The LDAC is aware of the workload of the SCS, and the number of special requests received by the CPCs. However, given the economic and social importance of this stock for the EU fleet, the LDAC demands that work on this stock is given the highest priority and that resources dedicated to it are intensified.

LDAC Recommendations for Cod NAFO Div. 3M:

In view of the advice submitted by the SCS on a TAC of 1,000t, the LDAC would like to make the following recommendations:

- **To maintain the cod fishery open at the highest possible level in accordance with scientific advice. The LDAC invites the Commission to reflect on the proposal made by the Portuguese trawl fleet industry as indicated above.**

In view of the recommendation made by the NAFO Scientific Council since 2015, that a scientific protocol should be set in place with a sampling plan to carry out a selectivity trials for both collecting data and testing the effectiveness and impact of the use of sorting grids in the reduction in catches of juvenile and small cod.



The LDAC would like to make the following recommendations to rebuild the stock and protect spawning aggregations of 3M Cod:

- **Improving gear selectivity through the use of the sorting (“Norwegian”) grid and analogue devices for all demersal trawlers targeting cod operating in NAFO RA.**
- **The adoption of a spatial-temporal closure for Subdivision 3M (Flemish Cap) from January to March 2021 to protect spawning aggregations of Cod, with fishing activity on cod allowed from April to December despite the significant impact on the fishing companies operations.**

3. Redfish 3LN

Based on the projections made on existing level of catches on the equilibrium model ASPIC, the three criteria set by the SC are met, namely: 1. high probability to be above Bmsy in 2026; 2. low risk that F is higher than Flim; 3. Low probability of Fishing mortality being below Fmsy.

In view of the above, the NAFO General Council adopted a management strategy based on an 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 was 18,100t and the same figure was applied for the 2020-2021 period pending of review.

SC conducted this year an update assessment of Redfish in Division 3LN followed by five-year projections (2021 to 2025) to evaluate the impact of annual removals at 18 100 tonnes on stock biomass and fishing mortality in relation to Blim, Bmsy and Fmsy by 2026. At the beginning of 2020 the stock was in the safe zone, with a probability of biomass being above Bmsy > 90%, and with the probabilities of biomass being below Blim and fishing mortality being above Fmsy less than 1%. Annual catch of 18 100 tonnes during 2021 - 2025 will maintain biomass above Bmsy at the beginning of 2026 with very high probability (> 90%). In general, recent recruitment appears to be low but the stock is projected to remain in the safe zone. Scientific Council will continue to assess this stock on a 2-year schedule.



The LDAC is of the view that the results shown above by the SC are consistent with the previous evaluation with only small differences. It even shows a slight improvement of the situation of the stock, with biomass increasing from 1.5 to 1.6 times above Bmsy. The LDAC also shares however the concern on the fact that levels of recruitment are considerably lower than those from 2000 and agrees with the 2-year schedule for review of this assessment.

LDAC Recommendation for Redfish 3LN:

Given the low probability of B falling under Blim, and Fmsy being below 30%, the LDAC supports the SCS advice to maintain this HCR with an annual TAC of 18,100 t for 2021. The LDAC also supports the recommendation of the SC to review the HCR and the performance statistics on a 2-year cycle and monitor level of recruitment.

It also notes the importance of this stock for some EU Member States, in particular Baltic States and Germany, which fully utilise their quota, either by catching or through swaps with Portugal and Spain. As a result, it has a high level of catches reported in recent years. The LDAC is of the opinion that these countries should not be penalised as a reduction of the TAC would have detrimental effects only to them due to the underutilisation of the quota by other CPCs such as Canada. In this respect, rather than a reduction of the TAC in line with the catch levels, these CPCs are welcome to establish an internal system to self-limit their quotas or allow some flexibility for quota reallocation/swaps.



4. Redfish 3M

The catch composition of redfish in this area include three species from the gender *Sebastes*: the first two, *Sebastes mentella* and *Sebastes fasciatus*, are known as “beaked redfish”, and managed as one single stock belonging to the population structure of the Northwest Atlantic redfish. The third species is *Sebastes norvegicus* (= *S. marinus*), which is known as “golden redfish” and dealt separately in terms of assessment.

It was approved that the stock assessment was based on a model of Virtual Population Analysis (VPA_XSA). The assessment was analysed this year by an external reviewer, showing a decrease in the biomass since 2014, with a further decrease in the abundance given the low levels of recruitment in recent years.

Projections have been made in the short term (period 2020-2022) under three different scenarios of F , namely $F_{statusquo} = F_{2018}$, $F_{0.1}$ and F_{max} . An assumption was made that catch levels in 2019 are in line with $F_{statusquo}$, even though this means assuming catch levels 19% above the 2019 TAC. The results calculate a decrease in SSB between 2019-2022 of 25% ($F_{0.1}$), 34% (F_{max}) and 36% ($F_{statusquo}$).

The SCS advice departed from the format of 2018, and instead of several options, the SC chose the $F_{0.1}$ scenario in 2019 for its projections for 2020 and 2021. The SC reiterates this approach this year and advises that catches should not exceed $F_{0.1}$ given the recent very low productivity of the stock. This corresponds to a TAC of 4,624 t for 2021.

The LDAC reminds that, at the NAFO annual meeting in 2017, the TAC was increased from 7,000t to 10,500t for 2018 and 2019.

At last year’s Annual Meeting, the TAC was fixed at 8,531t for 2020 by choosing the intermediate scenario of $F_{max} = 0.188$ instead of $F_{0.1}$ to allow balancing environmental and socio-economic sustainability for the fleets concerned.

The LDAC is concerned that the proposal made by SCS, drawn from the results of the assessment, reiterates the advice from last year and lead to a new recommendation for a reduction to the TAC currently fixed in 8,531 t down to 4,624 t. The LDAC acknowledges the increase of F in the last years and the low levels of recruitment. However, it also notes that the biomass is still very high and well above B_{lim} and has very high probability of remaining above B_{lim} in 2022 in all three scenarios.



The LDAC also notes that for the Redfish 3LN stock, which is adjacent to 3M and might have potential stock mixing or population overlaps, a proposal for setting the TAC for 2021 to 18,100 t is maintained.

In the spirit of NAFO Convention, there should be promotion and coordination of conservation and management measures that applies to a stock or group of stocks found both within the Regulatory Area and within an area under national jurisdiction of a coastal State, in particular when taking into account the ecosystem approach to fisheries.

Recommendation for Redfish 3M:

Looking at the catch option table for short-term projections and the biomass probabilities of reductions, the LDAC considers that it would be more sensible to balance environmental and socio-economic sustainability for the fleets concerned to choose the intermediate scenario ($F_{max} = 0.188$), allowing a TAC of 8,448t for 2021, instead of the most restrictive one of 4,624t based on F0.1.



5. Redfish 30

This stock is revised by the SC on a three-year basis, and the last revision was in 2019. On the recommendation for 2020-22 the SC states that *“There is insufficient information on which to base predictions of annual yield potential for this resource. Stock dynamics and recruitment patterns are also poorly understood. Catches have averaged about 12,000 t since the 1960s and over the long term, catches at this level appear to have been sustainable. Scientific Council is unable to advise on an appropriate TAC for 2020, 2021 and 2022”*.

With that advise at the NAFO 2019 annual meeting the TAC for this stock was decided for the period 2020-2021-2022, with a TAC of 20,000t for 2020 and the condition to be revised again in 2021. In this respect, the LDAC notes that there is still insufficient information on which to base predictions for the SC and that the average catch levels for this stock have remained stable for the last 50 years (since the 1960s) within the region of 12,000 tonnes. The SC states on its report that this level appear to have been sustainable.

According to the current quota allocation for this stock, around 35% of the total TAC is allotted to the EU, of which the quota consumption (i.e. real catches) is over 75%. Russia has 32.5% and Canada near 30% of the total TAC. However, Russia and Canada have only caught in 2018 5.45% and 6.85% of their quota, respectively. The remaining amount is spread in “piecemeal” quotas amongst other CPCs, with 0.75% for Japan, 0.75% for Ukraine, 0.5% for Korea and another 0.5% for other CPCs, with none of them reporting catches with the exception of Japan, with only 4 tons.

This means that the EU is taking most of the reported catches, and it is highly dependent on this stock, which makes their fleet quite vulnerable to possible drastic reductions of TACs in the future.

The SC, at the June’s annual meeting, does not introduce any new information, and simply estimated the level of catches in 2019 at 6.526ts, while reiterating its 2019 advice in the following terms:

Recommendation for redfish in Division 30 for 2020-22: There is insufficient information on which to base predictions of annual yield potential for this resource. Stock dynamics and recruitment patterns are also poorly understood. Catches have averaged about 12 000 tonnes since the 1960s and over the long term, catches at this level appear to have been sustainable. Scientific Council is unable to advise on an appropriate TAC for 2020, 2021 and 2022.



Recommendation for Redfish 30:

Considering that:

- **The average catch levels for this stock have remained stable for the last 50 years within the region of 12,000 tonnes; and even decreased this year.**
- **The SCS was unable to provide an appropriate TAC proposal for 2020-2021-2022 but acknowledges that this level of catches appear to have been sustainable.**
- **The EU is practically the main actor interested in this fishery in terms of quota allocation (35% of the total TAC) and consumption (over 75%).**

In view of the above, the LDAC recommends *status quo*, namely, to maintain the TAC for Redfish 30 stock at the same level than that establish for 2019 and 2020, in the area of 20,000t, considering the historical level of catches and to avoid alternative approaches until new scientific advice is available.

The LDAC fully supports again the SCS proposal on the need to enhance the data collection programme to underpin the current stock assessment and move to an analytical assessment in the medium term.

The only actual danger on this stock is that other CPCs, looking at the downward trend of the catches, might ask to align or adapt the TACs to real catches. In this case, the only CP adversely affected would be the European fleets targeting for this species.

6. Witch Flounder 3NO

The LDAC notes that the revised stock assessment has been frontloaded from 2021 to this year under Scientific Council's own initiative due to expert availability. A Bayesian surplus production model was selected in 2018 and has continued to be applied since then. It is adopted to evaluate this stock taking into consideration the commercial catches and the spring and autumn Canadian surveys, including historical catches from 1960s.

The SCS report show an increase of the biomass from 1994 to 2013, followed by a decline during 2013-2015 and has since increased slightly. Although it is unclear if the recruitment index is representative, the one in 2019 is the highest in the time series.



The LDAC notes that, despite the uncertainty, the stock trends are positive:

- The biomass is increasing on a regular basis since 1994 (with an exception of the period 2013-2015).
- The fishing mortality remains at a very low risk (4%) of being above Flim ($F_{msy}=0.063$).
- The recruitment indexes have shown promising results with strong incoming year classes in 2017 and 2019.

After a closure of almost 20 years, this fishery was reopened in 2014 against the SA advice by request of Canada. The scientific advice recommended in that time "*no directed fishing and keeping the Bycatch at the lowest possible level*". Since then, the SC has maintained its advice, but the fishery has remained open at low levels of catches.

The agreed TAC for this stock last year in the Bordeaux meeting in 2019 was 1,175t, and it was applicable to 2020 and 2021. It must be reminded that this decision was taken against the SC recommendation of *no directed fishing in 2020 and 2021*, by the pressure of Canada and supported by Russia, that have jointly the biggest share (86%) on the quota. The EU has only 13% of the quota.

In terms of catches, in 2017, 657t were reported, and in 2018 increased slightly to 669t, which was well below the TAC fixed. The reported catches were mainly declared by Canada that has a 60% of the TAC, followed by Russia with a 25.73% and the EU with a 13.27% (namely Estonia and Latvia). Total catches estimated by the SC for 2019 were of 900t, and the distribution between CPCs was not disclosed.

For internal reasons, related to its 2021 Agenda, the SC in his annual meeting 28 May - 12 June 2020, decided "*on his own accord*" to frontload the revision of this stock one year in advance, and to proceed with a new assessment this year.

The SC decision is taken in the context of the NAFO Precautionary Approach framework which specifies that there should be a very low probability of being below Blim fixed at 10%. On this basis, the SC recommends that there be no directed fishing in 2021 and 2022 as it considers that there is not sufficient evidence that the stock would be able to sustain a fishery at this time in the context of the NAFO Precautionary Approach.

However, the LDAC notes that the percentages of this probability are remarkably close to 10%, i.e. 11% in 2021; and range from 7% to 11% for the scenarios with fishing mortality greater than zero for 2022 and 2023.



Furthermore, the recruitment index registered on the 2019 Canadian spring and autumn scientific campaigns, scored a record value for the last 25 years and is the highest in the time series. The SC report said that it is unclear if this recruitment index is representative.

Recommendation for Witch Flounder 3NO

It is the opinion of the LDAC that, given the fact that the actual quotas and volume of catches reported are very reduced, the difference between keeping the fishery open at the present level; and closing the fishery will be almost imperceptible and will not undermine the precautionary approach framework of NAFO. In fact, the possibility of having some direct data from the fishery can provide interesting information on the stock for future assessments. In particular, the LDAC encourages scientists to look at recent increased level of recruitments and review this assessment in 2022 in light of NAFO PA given that probability of this stock of being below Blim is very close to 10%.

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.



The SCS allows for an increase of the TAC currently set in 2020 in 17,000t to 21,100t in 2020. This increase stems from the SCS recommendation for this stock for 2019-2021: *At a fishing mortality of 85% Fmsy, catches of 24 900 tonnes, 22 500 tonnes, and 21 100 tonnes in 2019 to 2021, respectively, have less than a 30% risk of exceeding Flim. At these yields the stock is projected to have an 82% probability of remaining above Bmsy.*

It is worthwhile to note that the EU has not a direct commercial interest on this fishery as it has no quota allocated as target species but as by-catch in other fisheries. Catches during the last 10 years have remained stable and well below the TAC, at a level of around 10 000t per year, mainly due to the low activity of Canada, that according with the actual distribution key owns a 97.5% of the TAC and catch only less than 50% of its quota. St. Pierre et Miquelon has a 2% of the TAC and covers all its quota with a chartered vessel, while the 0.5% of the remaining quotas are covered by Russia, declaring a small quantity.

LDAC Recommendation for Yellowtail Flounder 3LNO

Considering that:

- **The SSB is estimated to be above Blim; and F is estimated to be below Flim and close to Fmsy;**
- **The stock is in the safe zone as defined in the NAFO Precautionary Approach Framework.**
- **The next scientific assessment for this stock is planned for 2021.**

The LDAC recommends following current scientific advice by SCS of setting a TAC at 21,100 t for 2021.

The LDAC notes that this 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. For example, an increased catch of yellowtail flounder may increase as well the by-catch of Div. 3NO cod and Div. 3LNO American plaice.



8. Thorny Skate in Division 3LNO

An updated assessment for this stock was completed this year by the SCS and its recommendation for 2021-2022 is as follows: *The stock has been stable at recent catch levels (approximately 3 511 tones, 2015 - 2019). However, given the low resilience of this species and higher historic stock levels, Scientific Council advises no increase in catches.*

The main campaign is Canadian. The status of the stock is currently above Blim, and the probability that the current biomass is above Blim is >95%. Total survey biomass in Divs. 3LNOPs has remained stable since 2007. Recruitment in 2017 was above average but declined to below average in 2018 and was average in 2019. Fishing mortality is currently low.

The LDAC notes that with the same advice, the proposed TAC for division 3LNO has been set since 2013 at 7,000t, taking into account that the catch levels are stable around 3,500t given that the EU is the only CPCs having a directed fishing in the zone, with other CPCs (Russia and Canada) not participating in this fishery. The quota allocation of the 7,000 tones adopted for 2019 (last year of data available) was: European Union 4,408t (63%); Canada 1,167t (17%); Russia 1,167 (17%); and others, the remaining 3%.

There is also an independent skate fishery in 3PS managed as a separate unit and for which Canada maintain an independent quota of 1,050ts unchanged since 1997.

Total declared catches of thorny skate were of 4,463t in 2017; 2,412t in 2018; and 3,697 t in 2019; respectively, for a TAC of 7,000t for each year. 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. In recent years only the EU has maintained a direct fishery in the zone.

Within the EU, the internal allocation gives to Spain 3,403t (77%), with a declared consumption in 2019 of 3,114t (92.4%). Portugal has assigned 660t (15%) and its declared catches have been stable in the last years above 300t.

Estonia has the remaining 8% with a total of 345t (no data of reported catches for 2019).



LDAC Recommendation for Thorny skate 3LNO

Similarly, as in previous years, the LDAC agrees with the SC recommendation of “*no increase in catches*” which are stable in the region of 3,500t in average.

However, the LDAC does not support the specific translation into figures of the advice for the 3LNO portion as it cuts down the TAC almost in half, from 7,000t in the last years to 3,511 t for 2021 based on the average catch levels from 2015 to 2019. This interpretation *de facto* penalizes to the only one CPCs (the EU) fishing actively, resulting in a substantial reduction of its quota, without having a real impact in the conservation of the stock.

In this particular, the LDAC reminds the importance of the Thorny Skate 3LNO stock for some EU MS, in particular Spain, which fully utilize its allotted quota. This is the reason whereby individual MS should not be penalized or have detrimental effects on the TAC due to the underutilization 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.

The LDAC notes that the addition of footnote under no 13 on the catch table, as it was done in 2019, would be an enough safeguard measure to avoid an effective increase in catches as it sets up a warning system once catches are reached at 5,000t.



9. White hake 3NO

The management unit for this species for which advice is requested by NAFO is Division 3NO and Subdivision 3Ps (as it is part of a wider stock).

This stock is considered data poor and relatively unknown with great uncertainty, relying on a qualitative trend-based assessment drawn from scientific surveys and catch indexes. The biomass for this stock fluctuates and it is variable at low levels and there have been no good recruitments since 1999-2000 when there was a peak observed. The fishing mortality remains low.

Given the absence of strong recruitment, the SC recommends for 2020-2021 that catches of white hake should not increase, stating that average annual catches over 2014-2018 were 406 tonnes.

LDAC Recommendations for White Hake 3NO

Given the absence of new scientific information and the low recruitment indexes observed, the LDAC acknowledges and supports the recommendation from SCS to do not increase catches above the current level.

The LDAC thinks that the SCS recommendation is consistent with maintaining the current TAC set for 2019 and 2020 in 1,000 tonnes as the average level of catches is stable around 400-500t, allowing with this formula to couple it with the complexities of quota allocation keys for TAC of different species between CPs.

The LDAC notes that white hake is a non-targeted fishery but mostly a by-catch fishery. It also highlights that this species appearance is variable and seasonal, depending on spawning aggregations. Therefore, it stresses the importance of setting in place an adaptive mechanism that allows to manage accidental catches as a result of these “booms”.

The LDAC also supports the possibility of establishing a mechanism to increase the TAC in future years, in case that a significant increase on the CPUE is observed in the scientific surveys.



10. Northern Shortfin Squid in Subareas 3+4

The LDAC notes that, in terms of fishing dynamics, since the 90s, the squid fishery has been mainly a seasonal one with low level of catches. However, there is a number of Spanish vessels represented in the LDAC which have become more active in the area targeting squid during the last years.

The SCS makes as recommendation for 2020–2022: *The primary biomass index (Div. 4VWX) and mean body size value for 2018 were not available for use in the assessment. The 2019 values indicated that the stock may be moving towards a high productivity period. SC advice is a TAC of no more than 34 000 tonnes/yr.*

Recommendation for Squid 3+4:

The LDAC advises that the European Commission follows the SCS recommendation which takes into account the socio-economic importance of this fishery for the Spanish cephalopod freezer fleet.



11. Northern Cod 2J3KL

The LDAC notes with concern the situation of this stock, caught within the Canadian EEZ, and expects that Canada reduces the fishing pressure within its EEZ. The LDAC recommends that the EU should follow closely the evolution of the catches in this area. To maintain pressure on Canada the EU should not exclude an option that in the future asking Canada to give entitlement to other countries to access to this fishery, as there is a consensus on a moratorium that everybody is implementing except Canada.

Not only has Canada not refrained from fishing in these areas of the RA, but the catches there have reportedly increased year after year. For instance, the TAC increased of 25% from 9,500 tons in 2018 to 12,350 tons in 2019. For 2020, Canada maintained the TAC of 12,350t while the EU fleet has not access to 3L cod and there is a moratorium on 3NO (leaving only 3M Cod as the only fishing ground)¹. Moreover, it seems that there is also a significant number of unreported catches and discards that need to be included when it comes to Canada's catches of cod 2J3KL².

This increase in TAC occurs despite scientific advices stating that “despite good growth in recent years, the stock is still in the critical zone with a low recruitment level”³. Also Fisheries and Oceans Canada (DFO) indicates that “management actions must promote stock growth and removals from all sources must be kept to the lowest possible level until the stock has cleared the critical zone.”⁴

The LDAC would like to bring the attention of the EC to Parliamentary Canadian report where a former member of the New Democratic Party Caucus intervenes on the issue on discards and unreported mortality rates related to regulatory framework of stewardship northern cod fishery. From this intervention the LDAC understands that not all catches are reported and considering that the EU is the stakeholder in this stock it increases LDAC concern about Canadian disregard for internationally agreed moratorium⁵.

¹ More info: <https://www.dfo-mpo.gc.ca/fisheries-peches/commercial-commerciale/atl-arc/management-plan-gestion/CHP-cod-PPAC-morue-2019-eng.html> and <https://www.dfo-mpo.gc.ca/fisheries-peches/decisions/fm-2020-gp/atl-25-eng.html>

² For instance page 6 and 7 of the Report of the Standing Committee on Fisheries and Oceans (March 2017) <https://www.ourcommons.ca/Content/Committee/421/FOPO/Reports/RP8826804/foporp10/foporp10-e.pdf>

³ Page 5 of the Report of the Standing Committee on Fisheries and Oceans (March 2017) <https://www.ourcommons.ca/Content/Committee/421/FOPO/Reports/RP8826804/foporp10/foporp10-e.pdf>

⁴ DFO, “Northern (NAFO Divs. 2J3KL) Cod Stock Update,” Canadian Science Advisory Secretariat Science Response 2015/018, May 2015, p. 8

⁵ Page 8 of the Report of the Standing Committee on Fisheries and Oceans (March 2017) <https://www.ourcommons.ca/Content/Committee/421/FOPO/Reports/RP8826804/foporp10/foporp10-e.pdf>



The existing agreement between Canada and the EU on the sharing of TAC in that area elapsed in 2005, but that does not mean Canada is entitled to unilaterally set a TAC for itself on this closed stock. Once the stock is in a good condition 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 is of the opinion that while Canada is still fishing for cod 2J3KL, all CPCs for which the cod 2J3KL quota had been reduced to 0, should receive a compensation. The level of compensation should be calculated based not only on subsequent TACs set by Canada but also on unreported catches and discards from Canadian EEZ.

The LDAC also recommends that Canada should be made aware that, regardless the technical nomenclature and arguments provided, the reality is that they are setting a unilateral TAC and conducting a targeted fishery on this area. It is also imperative that the EU, together with other CPCs, 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. Also, additional attention needs to be focused on unreported mortality.

Given the above, the LDAC would like the EU to ask for:

- **fishing data on cod 2J3KL from Canadian fishery covering not only official catches but also a level of unreported catches and discards,**
- **data and reporting by Canada on the seismic, deep sea mining and oil drilling activity that are currently going on in that area.**

The LDAC is aware how sensitive the cod 2J3KL matter is. However, the LDAC believes that this is one of the issues that could be used by the EC to seek agreement in other dossiers of stocks of interest for the EU where Canada's position is crucial.



12. 3M Shrimp

The LDAC reiterates the high importance and commercial and socioeconomic value of this stock, which was under a moratorium from 2011-2019. The EU is by far the largest NAFO CPC in terms of quota share for this stock, which was the most valuable one in terms of landings during the period 1995-2010. Within the EU, Estonia is the largest fishing nation of 3M shrimp followed by Lithuania, then Latvia and, to a lesser extent, Denmark, Poland, Spain and Portugal.

The LDAC expresses its gratitude for Commissions key-role in the negotiations that led to reopening the fishery this year. However, the fishing for shrimp in NAFO has still not restarted. The reason is mainly connected to the current CEM rules that does not reflect complications derived from managing stocks reopened for fishing following long period of moratorium, coupled with logistic issues caused by the COVID19 pandemic.

In mid-January, a Canadian vessel (Newfoundland Victor) became the first trawler in 9-years to shoot shrimp trawl at NAFO 3M. The trawler started fishing at traditional towing path for shrimp, north-west off the Flemish Cap, and towed for about 5 hrs. The shrimp catch was small to none. Minor quantity of juvenile redfish slipped through the 19mm wide sorting grid on the shrimp trawl, and same was reported as by-catch. Because of the low shrimp catch the proportion of the 100 kg of juvenile redfish exceeded current NAFO limits. As per NAFO rules, the Canadian vessel moved 10 nautical miles for the second tow. And again, the result was very little shrimp catch leading to a proportionally high quantity of juvenile redfish found in the shrimp codend. In total 0.27 tonnes of juvenile redfish found its way through the 19mm sorting grid and accordingly, as per current NAFO CEM, the vessels shrimp operation came to a halt for 60 hrs. Such delay from fishing operation is not feasible and the vessel moved back to Canadian waters.

In NAFO CEM Article 6 by-catch retention of fish is set with both proportional and kilo limits per haul, were “whichever is the greater” applies⁶. In case of exceeded by-catch limits, vessels must move a minimum of 10 nautical miles. If the by-catch limits are exceeded again the vessel should leave the Division for a least 60 hrs. When a vessel returns to the Division the following tow is limited to 3 hrs testing only, and if the by-catch is at that time within the limits the vessel may finally continue normal fishing operations (if not, then vessel should leave the Division for another 60 hrs).

⁶ E.g. Article 6.3 (c): “for all other stocks listed in Annex I.A where no specific quota has been allocated to the flag State Contracting Party: 2500 kg or 10%, whichever is the greater”.



The phrase “*whichever is the greater*” applies to all by-catches in NAFO waters except for shrimp fishing. Allowing for both proportional and kilo limits of by-catch is of high importance in this regard as it corrects aberration in catch of the targeted specie. It is important to understand that the limits apply to catch in a single tow, which can vary a lot within a given day (night-time vs daytime).

For by-catch in shrimp fishery the phrase “*whichever is the greater*” does not apply and therefore there is no kilo reference on by-catch levels⁷. That is not a problem under normal circumstances when recent towing paths for shrimp are known and trawlers apply sorting grids. But following 9 years of moratorium nobody knows where decent shrimp catch can be expected. The decade old towing paths from the past might not hold any shrimp today, while unexplored or little used parts of the Division probably do.

Due to the long-lasting moratorium, vessels fishing for shrimp in NAFO 3M are to some extent faced with a new and unknown fishing ground. The scientific survey in 2019 tells us that the stock is healthy at the Flemish Cap, but it does not say where the quantity is concentrated enough to justify commercial effort. The old towing paths from 1993-2011 are of little use as the shrimp biomass intend to shift within the 58,000 square kilometres area over time. In 2010, the LDAC argued the importance of maintaining minimal level of commercial activity in the region for collecting information on the shrimp (CPUE, size distribution, towing pattern etc.). Imposing moratorium on shrimp fishing in the high seas, were the fishing effort is self-regulating as only the targeted species has a commercial value, is highly questionable measure⁸.

The LDAC understands the importance of a sustainable biological approach to this fishery and its interactions with cod and redfish in a multi species context at the Flemish Cap. It also supports the need to consider impact on socio-economic aspects of fisheries and the possible future benefits for the EU fleet derived from this important fishery.

⁷ See Article 6.5: “By derogation, the calculation of groundfish bycatch levels in paragraph 3 of this Article shall not include the catches of shrimp in the total catch on board”.

⁸ For example, moratorium has never been applied for shrimps in the Barents Sea and the fishing has been taking place for over 50 years with good results and the state of the stock is reported as strong (stock is at historical heights and well-above MSY $B_{trigger}$ as per the latest ICES advice). A moratorium has neither been applied for the offshore shrimp stocks in Greenlandic, Icelandic or Canadian⁸ waters.



The LDAC appreciates that the EU makes annual surveys for shrimp in areas 3LNO and 3M. It also appreciates the fact that last year the advice was available in time for the September Annual meeting. We hope for continuation of timely release of the advice, prior to NAFO Annual Meetings.

The LDAC acknowledges the European Commission's negotiating team good-work on converting the old shrimp fishing-day effort regime (established in 1996) over to a TAC based one. The LDAC fully supports the Commission in establishing tonnage quota system for NAFO 3M shrimp, and the attempt to agree with other CPC on reasonable split of same.

LDAC Recommendation for Shrimp 3M:

- **To continue progressing with work of transitioning from the old fishing-day system over to TAC based quota system through a phased approach. In this respect, the LDAC will be happy to assist the EC through the range of options to agree to define the basic elements or parameters to agree on a calculation for the conversion of days at sea into tonnes for a TAC looking at allocation keys based on effort days and historical catch record and selected periods.**
- **To amend the conservation measures on by-catch by allowing for more flexibility while the shrimp fleet maps the towing paths for shrimp. LDAC suggests either to amend Article 6.3 by adding a provision of by-catch of 2500 kg or 10%, whichever is the greater, for limited number of years. Or, to amend Article 6.6 for reopened fishery of shrimp by less burdensome measures of moving a vessel in case of breach of by-catch limits and allowing for significantly more hauls before leaving the Division⁹.**
- **To support all formal steps to prevent moratorium being applied as a conservation measure on NAFO shrimp fishing in the future. The answer to decreasing biomass of shrimp in the high seas should always be decreasing fishing effort, but never none.**

⁹ LDAC chooses not to present own recommendation of amendment as the same objective can be reached in different manner. However, the LDAC welcomes a further dialogue on this specific issue if requested by the Commission.



13. Shrimp 3LNO

The main CPC here is Canada, with around 87% of the TAC allocated.

The LDAC insists up on the two NAFO shrimp stocks, in 3LNO and 3M, should be treated consistently in respect of allowed fishing effort and scientific recommendation for same.

Recommendation for Shrimp 3LNO

The European Commission should be aware of insignificant importance of this stock for the EU fleet, and keep in mind the high socio-economic importance for Canada.

It is the LDAC's view that moratorium as a conservation measure is not justifiable in high-seas shrimp fishing with obligatory use of sorting grids.

14. Splendid Alfonsinos in Division 6G

This is a data poor stock, with catch and effort data from the commercial fleet (only 1 Spanish flag vessel). The population structure for this species in the three seamounts of Corner Rise (NAFO Div. 6G) is unknown. Until there is more information available on this, the SCS assumes that each seamount constitutes an individual stock.

In 2018, an assessment was made advising not to increase the fishing effort in the area exploited ("Kükenthal Peak"). During the June meeting this year, 2018 were revised and it was observed a significant decrease in catches, with only 2t reported by the single vessel operating there, indicating a possible situation of depletion of the stock.

Therefore, the SCS decided to undertake a more comprehensive assessment and revise its advice for 2019 and beyond and concluded the following: *The substantial decline in CPUE and catches on the Kükenthal Peak in the past year indicates that the stock may be depleted. SC advises to close the fishery until biomass increases to exploitable levels.*

The SCS recommendation for this year reiterates this advice.



As reflected in previous years' advices, the LDAC highlights that the absence of information and reliable stock assessment and information on population structure hampers a sound advice due to lack of abundance and exploitation data for these stocks. As a result, the SCS has been unable to provide an analytical assessment and set an appropriate TAC for 2019 and beyond. In contrast with the lack of specific data on this stock, and considering the non-concerning conservation status of the species, and the small level of catches reported, the LDAC is of the opinion that this stock has been given a disproportionate attention and political focus by CPCs that have no interest in the fishery and/or market.

The LDAC reminds that Alfonsinos 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.

Overall, the LDAC finds it concerning that the SCS takes the CPUE from the commercial catch data as an index for abundance as there is only one fishing boat with very limited activity there. If the single boat were to cease this fishery, there would be virtually no more data being produced for this stock to be assessed.

The LDAC considers this as a risky approach as catches can differ substantially from one year to another as they are seasonal and variable, one of them being that this stock only migrates to the seamount's surface under specific environmental conditions (it is forbidden to use a bottom contacting gear). When not available, the catches are drastically reduced from one year to another, as it was the case for 2018 where lower catches are observed.

In terms of management decisions, the LDAC would like to share the divergent views of the fishing industry and other interest group members on this matter:

- The **fishing industry of the LDAC** is against closing this fishery (or establishing a moratorium) until there is scientific advice underpinning this.
- The **NGOs Seas at Risk, Oceana and CFFA-CAPE** argue that catches of Alfonsinos declined by 90% and this was after years of no agreement on management measures and regulations. In addition, there are no protocols for experimental scientific surveys, and the data required could have been collected over the past several years of the fishery, rather than proposing data collection after the stock has been decimated.



Recommendation for Splendid Alfonsinos in Div. 6G

Industry position

In order to break this vicious circle of lack of data, the LDAC fishing sector representatives propose to set in motion an experimental scientific campaign for this stock in Kükenthal Peak. They suggest using the only commercial vessel involved in this fishery with a scientific protocol validated by NAFO Commission, in order to allow further exploration and collect necessary data (through an echo sounder acoustic survey) for improving scientific assessments and knowledge on biology and behaviour of this species.

The LDAC looks forward to being informed by the SC at the Annual Report on the outcome of the Commission's request to review the submitted protocols for a survey methodology to inform the assessment of Splendid Alfonsino.

The fishing industry representatives of the LDAC envisage to make contact with the concerned shipowner/operator via their member organisation ARVI-ANAMER, to investigate the possibility to carry out a scientific survey to take place in the first quarter of the year, i.e. February-March 2021, to optimise fishing vessel commercial plan and pre-set route and minimise economic losses in fuel and operations. This should be consistent with the CPUEs reported in previous years, which have always been in those dates. It is also confirmed that the referred vessels have a suitable equipment for performing such survey.

The LDAC reminds that reported catches are very low but still can differ from one year to another as they are highly seasonal. This can be due to factors such as changes in Alfonsinos behaviour (migration of the stock up in the seamount surface depending on environmental conditions) and compliance with the NAFO management measures (no allowed to use a bottom gear contact with seafloor).

NGO position:

Seas at Risk, Oceana, CFFA-CAPE and SSNC argue that catches of Alfonsinos declined by 90% and this was after years of no agreement on management measures and regulations. In addition, there are no protocols for experimental scientific surveys, and the data required could have been collected over the past several years of the fishery, rather than proposing data collection after the stock has been decimated.



15. Vulnerable Marine Ecosystems (VMEs)

Noting the ongoing review of the adequacy of VME closures in the NRA, in addition to the 2021 assessment of Significant Adverse Impacts on VME indicator species in the NRA, which will apply all 6 criteria from the FAO Guidelines on Deep Sea Fisheries, progress can be made to advance VME protections this year. With the UNGA Review of bottom fishing measures postponed from August 2020 to August 2021, there remains opportunity for NAFO to continue to fill gaps in VME protections.

The June 2020 Scientific Council meeting recommended the addition of black corals to the NAFO VME indicator list, following new data on the presence of black corals in trawl surveys in the NRA. Concentrations of black corals exist within known VME areas and protections can be advanced through following the advice of SC stemming from its review of VME closures.

Industry position

Given the extraordinary circumstances related to COVID-19 pandemic and the occurrence of this year Annual Meeting by virtual conference, with a reduced agenda and priority short term items related to decisions on management of stocks, the fishing industry representatives of the LDAC advice to wait for next year review of the Scientific Council on the work progress and recommendations of the NAFO WG EBM (held in July 2020 after the SC) before adopting any decision related to the expansion of VMEs, and in particular the protection of black corals.

In 2021, it is expected that the SC releases its advice with recommendations for:

- Specific VMES where protection has been deemed poor or inadequate;**
- Management measures to be agreed in particular for the 3O coral closure, Area 1 and Areas 4-12; in addition to revisiting Area 14 sea pen closures.**

NGO position

Seas at Risk, WWF, Oceana, CFFA-CAPE and SSNC are in favour of adding black coral to the VME indicator list as recommended by the SC. The above-mentioned NGOs also support the continued avoidance of research trawl surveys within the closed areas and encourages the reporting of encounters of VMEs above agreed thresholds to the NAFO Secretariat, in order to ensure minimum damage to the VMEs currently protected.



16. Ecosystem Approach

Given the progress made over the past several years at the Scientific Council on an ecosystem approach to fisheries management, and with the view that at some point NAFO managers will be in the position to make decisions based on an ecosystem approach, there are key recommendations from the Scientific Council that can be agreed this year. The development of the NAFO Roadmap has meant significant investment by Contracting Parties and their scientists. In order to ensure that this investment ultimately benefits the sustainability of the fisheries in the NRA and advances RFMO progress on ecosystem-based decision making, the LDAC recommends the following to be agreed at the NAFO Annual Meeting:

As proposed at the WG-EAFFM meeting in August and as an interim measure in the implementation of the Roadmap, that when the combined TACs of NAFO managed fisheries are two-fold above the Total Catch Indicator guidance, consequences to fisheries sustainability be considered.

Such an agreement would be in keeping with NAFO's current fisheries sustainability sheets and ecosystem sheets and would advance the incorporation of NAFO's stoplight approach. Given the reduced protection potential of the 2JK and 3LNO ecosystem units (40% and 30% respectively), there is a need to better link this reduced potential to recommended catch levels.

In addition, the LDAC supports further development in the coming years, of the Roadmap including the advancing in multi-species models and simulations to evaluate the reliability of decision rules for species aggregated (TCI) catch levels.

-END-