North Sea Advisory Council

NSAC Advice Ref. 01-1718

Comments on the Implementation of the Landing Obligation in the North Sea Demersal Fisheries - Joint Recommendation for a Delegated Act for 2019

This paper was approved by the NSAC Executive Committee via a written procedure on the 26th April 2018.

Introduction

Since the Landing Obligation was adopted in 2013, our collective understanding of the implications of the new policy has steadily increased. In particular, much work has been done in the regional groups and in the advisory councils to identify the scale, location and frequency of choke risks in mixed fisheries as well as understanding where, suitable solutions are to be found through improvements in fishing practices or management.

As we approach the full implementation of the landing obligation in the North Sea demersal fisheries from 1st January 2019, it is clear that:

- Whilst the Joint Recommendation will be able to mitigate some choke risks, the Delegated Act for 2019 will not be capable of resolving all the potential choke risks for the North Sea demersal fisheries
- Further measures will have to be adopted by the Council of Ministers, and possibly through the co-decision process, if the choke problem is to be fully tackled. The North Sea AC will therefore present information and advice in three stages:
    1. This guidance note concentrates on what can be done through the Joint Recommendation/Delegated Act
    2. A further piece of advice will be presented in June on those aspects of the choke issue which will require the attention of the Commission and the Member States at the coming Council meetings or at latest at the December Council
    3. Later in the year we will present advice on broader legislative changes which may be required to achieve a workable landing obligation within the broader fisheries management system in the North Sea, while achieving its purpose to avoid and minimise unwanted catches

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Background information

- Considerable progress has been made in improving gear selectivity to minimise unwanted catch. These efforts, through trialling different net geometries, as well as fishing strategies that avoid unwanted catch, will continue. However, recognising the limited amount of time left until full landing obligation in 2019, considering the characteristics of some species, the mixed nature of many North Sea fisheries and starting points in mixed fisheries, advances in selectivity will not solve all choke problems in the time required. Some selectivity developments are mentioned in the species section below. It is to be noted that these selectivity statements are primarily for context and not meant as a comprehensive review of existing or possible options.
- Phasing the introduction of the landing obligation has been only a partial success. Instead of sequentially addressing choke issues, species by species with some of the difficult species being introduced early, a focus on easy wins and a push back on hard cases has resulted in a situation where unresolved issues remain. This will mean that 2019 will be the big-bang that we had all hoped to avoid.
- Work within the regional groups has focused mainly on category 3 chokes – those where there is insufficient quota in a sea basin across a number of member states. However, there remains a very large number of potential chokes associated with the way that quota is distributed between and within member states, in other words category 1 and 2 chokes. Much work has to be done between now and 1st January 2019 to remove this type of choke. We do not underestimate the practical issues and political sensitivities involved and have repeatedly stated in our advice that political will and stamina will be needed to address these issues.
- In some plaice fisheries, economic chokes are a threat (category 4). These result not from a shortage of quota but from a situation where the sheer bulk of unwanted catch threatens the viability of the trip and therefore the fishing business. It is also important to find solutions for this type of choke. No solution has yet been found to address the problem of having to land unwanted catches below MCRS, leading to economic chokes.
- There remains sufficient uncertainty about the discard estimates underpinning quota uplifts to raise concerns about the consequences should there be a significant misalignment of quota availability with actual catches experienced.
- We do not underestimate the complexities and political sensitivities involved in addressing the category 2 chokes that result from misalignments between the current distribution of quota and the choke risks in specific fisheries. It is noted that:
    i. Relative stability as the basis for quota distribution between member states is enshrined in EC Regulation 1380/13
    ii. It seems inherently wrong to reward those who have done less to reduce unwanted catch, compared to others who have made the effort
    iii. Crude and ill-informed interventions in allocating quota can be disruptive to national systems and generate unintended consequences
    iv. The system of international and internal domestic in-year and post-year quota swaps is well developed and already involves many thousands of transactions each year to move quota from where there is a surplus to where there is a deficit.

Having said all this, there is a clear need to address the type of choke caused by a misalignment between quota allocation and choke risk. We therefore urge member states to use the period between now and the full implementation of the landing obligation from 1st January 2019, to engage with each other on how an enhanced system of information and subsequent voluntary quota transfers might operate.

- North Sea demersal fisheries are highly dynamic and variable. This has implications for the degree to which chokes can be predicted. The fisheries are subject to ecosystem change that can result in distributional shifts in fish species. This has potentially significant implications for the prediction of chokes and the tools available to mitigate them if they result in a misalignment of stocks with current management areas and the allocations linked to them. Sometimes it is difficult for stock assessments to establish the magnitude of year-classes entering the fishery, making setting a relevant TAC difficult. This is why the ongoing effort in data collection on the less important economic species continues to be essential, as these may become choke species. To deal with unexpected choke situations some contingency planning would be needed, later advice will focus on this.

The specific tools available to use in the Joint Recommendation are limited and are defined in Article 15 of EU Regulation 1380/13. Namely,

- High survival exemptions for species for which scientific evidence demonstrates high survival rates, taking into account the characteristics of the gear, of the fishing practices and of the ecosystem;
- *De minimis* exemptions where improved selectivity has been shown to be difficult to achieve

We have commented below on where these tools might usefully be considered for the JR.

Interspecies Flexibility

Interspecies flexibility[1], may provide a route through which some choke risks may be mitigated. Preliminary discussions, however, suggested that there were a number of impediments to its widespread use. Where interspecies flexibility can be permitted under the rules and where the complexity of implementing[2] the approach can be addressed, it may have a valuable but a limited role to play. It is important to maintain efforts to identify where this tool could be used safely and what conditions should apply to it being used.

Choke Risks in 2019

The applicability and likely utility of specific measures to mitigate choke problems heavily depends on the type of choke in question. It is therefore crucial to identify the likely choke

[1] Art. 15(8) of the CFP basic regulation (Regulation 1380/2013).[2] article 4.1 https://stecf.jrc.ec.europa.eu/documents/43805/748345/STECF+PLEN+14-01.pdf

[2] Scientific, Technical and Economic Committee for Fisheries (STECF) – 45th Plenary Meeting Report (PLEN-14-01). 2014. Publications Office of the European Union, Luxembourg, EUR 26616 EN, JRC 89783, 86 pp., section 4.1.
https://stecf.jrc.ec.europa.eu/documents/43805/748345/STECF+PLEN+14-01.pdf

category in order to find suitable mitigation measures and avoid wasting time and resources on exploring options that are unlikely to be helpful. The following examples illustrate this:

- ***De minimis* exemptions:** *De minimis* exemptions can play an important role for example for mitigating choke situations related to storage or disposal issues. However, while several *de minimis* exemptions are already in place and considered useful in certain fisheries, the following needs to be considered when applying them in category 3 choke situations: As the anticipated *de minimis* amount is deducted from the (already limited) quota when the TAC is set, there is a risk that such exemptions, particularly when applied to more than one species,[3] may exacerbate rather than improve the overall quota limitation.

- **Type 2 choke (enough quota overall, but quota limitation for individual Member States)**: The solution for such chokes most likely lies in addressing the source of the issue, by finding improved ways of making quota available where it is needed. This cannot be addressed through joint recommendations and a discussion of such options is outside the scope of this advice.

- **Stocks covered by more than one TAC**: In some cases, an individual TAC may be limiting (i.e. resemble a TAC-level category 3 choke), whereas the sum of all TACs referring to the stock combined is sufficient to cover all catches, or the overall quota deficit is less severe than for the individual TAC viewed in isolation (e.g. hake in the North Sea, ling in North Sea and Skagerrak). This may, for example, be related to a change in the stock distribution over time while the proportion of the individual TAC in relation to the sum of all TACs remained constant, or to the allocation of quota top-ups based on relative stability. Solutions will most likely involve finding improved ways of making quota available where it is needed, but this is outside the scope of this advice.

This shows that different mitigation options may be more or less applicable, depending on the choke category. However, it can prove difficult to accurately define a potential choke as the categorisation can differ depending on the data used and is subject to change depending on stock and quota development. Therefore, any categorisation, including that presented in this current advice, should be treated with caution, as outlined in Appendix 1.

Notwithstanding, in the following section we have identified those stocks where, in our perception and based on the data provided by the Scheveningen group,[4] chokes are most likely to occur in 2019, bearing in mind the qualifications made above and in Appendix 1. We have also included the reasoning behind our decisions and have described the tools that may be available to mitigate each particular choke risk.

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[3] STECF has highlighted that '*any de minimis discard quantities should (and have been) deducted from the catch opportunities arising from FMSY based catch advice',* that combined exemptions for more than one stock are *'likely to reduce the fishing opportunities for all other fleets catching these stocks [, meaning that] any flexibility granted to some groups of vessels could have negative implications for other groups of vessels*', and that therefore Member States '*should be aware it will mean the eventual TAC will be much lower*'. STECF-17-08, Evaluation of the landing obligation joint recommendations (STECF-17-08). Publications Office of the European Union, Luxembourg, 2017, doi:10.2760/149272, pp. 96, 27 and 39.

[4] Dataset titled ‚Choke species analysis, version 2018.03.01.xlsx', shared with the NSAC on 27 March 2018. Referred to as 'Scheveningen dataset' throughout this document.

Species Analysis

Cod (*Gadus morhua*) Subarea 4, Division 7.d, and Subdivision 20 (North Sea, eastern English Channel, Skagerrak)

Type of choke[5]
Category 2 or 3

- Scheveningen dataset (2016 landings vs. 2016 TAC)[6]: category 3
- 2016 catch vs, 2018 ICES advice (whole stock): category 2

Selectivity statement

Capture of Cod below the MCRS is relatively low due to the gear configurations used. Cod tend to seek safety by moving down the water column when threatened. Vessels engaged in the large mesh (TR1) demersal mixed fisheries have adapted their ground gear so that young fish can escape under the net.

Small mesh TR2 nets fishing for Nephrops have been significantly re-designed to reduce the height of the night. A range of large square mesh panels is now a feature in these fisheries.

Large cod are difficult to avoid through the use of improved gear selectivity as most cod are caught in conjunction with a number of other key commercial species of varying sizes. Cod display similar behaviour in the net to some other target species which makes selectivity based on escape behaviour difficult.

The gill net fishery for cod is a selective, targeted fishery.

A number of closures are in place to protect spawning females. These are deemed to be very successful and are believed to have contributed to recovery of North Sea cod.

Remedial Measures available in the Joint Recommendation

High Survival	Relevant for pot and trap fisheries
De Minimis	Relevant for some specific fisheries to a limited extent
Inter Species Flexibility	Applicable – Depends on the biological status of the stock

Conclusion

The majority of discarded cod are fish above the MCRS. The high discard rate in the UK (circa 33%) is a result of insufficient cod quota to accommodate catches in a mixed fishery.

[5] This categorisation should be treated with caution, as outlined in the introduction of this advice, see p. 4 for details. See Annex IA and IB for data used for choke categorisation.
[6] Note that there are four TACs referring to this stock (COD/2A3AX4, COD/04-N., COD/03AN, COD/07D), but that this conclusion based on the Scheveningen dataset only refers to COD/2A3AX4 and COD/04-N combined.

De minimis will only avoid chokes for those fisheries where unwanted catches are minimal. This does not apply to most demersal North Sea fisheries

High survival exemptions are not relevant for species with a swim bladder, except, possibly for shallow water fisheries.

Interspecies flexibility could be applied, although the NSAC remains unclear how this will operate in practice given issues of relative stability and MSY harvesting.

The industry is limited in what else they can apply to reduce catches of cod without losses of other commercial catch. As a result, responsibility would fall on fisheries managers to implement additional measures to reduce unwanted catches of cod.

Cod (in the Kattegat)

Type of Choke[7]

Possible Category 3

- Scheveningen dataset (2016 landings vs. 2016 TAC): no choke
- 2016 catch vs. 2018 ICES advice: no choke overall, possibly category 2
- Scheveningen dataset (2016 catch vs. 2016 TAC): category 3[8]

It has been pointed out by the Danish and Swedish fishing industry that Cod in the Kattegat appears to be one of the stocks in which official discard estimates and the experience in the fishery are at considerable variance. This suggests that although the official statistics indicate that there will be no choke or a category 2 choke, the reality is likely to be very different, and a category 3 choke should be prepared for.

Comparing catches in years of a larger stock of Kattegat cod to recent catches in either the Nephrops fishery or the flatfish fishery indicates a likely increase in cod catches as the stock increases, which would become a choke issue for the Kattegat fisheries.

Selectivity statement

Cod is mainly taken as bycatch in the TR2 nephrops fishery as well the flatfish fisheries and the gillnet fisheries.

Legal requirements for gear in the Nephrops fishery in the Kattegat entails a 90mm trawl with panels, which already provides for further selectivity compared to the requirements in Regulation 850/1998 on technical measures.

Installing further selectivity measures such as grids can eliminate important bycatches of both cod and other valuable bycatches (e.g. sole and plaice) in the Nephrops fishery and could lead to considerable economic losses for the fishermen. Loss of commercial catch is an impediment to the development of further selectivity in the flatfish fishery.

Remedial Measures available in the Joint Recommendation

High Survival	Relevant for pot and trap fisheries
De Minimis	Relevant for some specific fisheries to a limited extent
Inter Species Flexibility	Applicable – Depends on the biological status of the stock

Conclusion

In 2012, the fishery for cod in the Kattegat was limited to a bycatch fishery due to concern of the state of the stock and following a decrease in the stock size. However, the cod

[7] This categorisation should be treated with caution, as outlined in the introduction of this advice, see p. 4 for details. See Annex IA and IB for data used for choke categorisation.

[8] Note however, that in 2016 this stock was not yet under the landing obligation, i.e. instead of the total catch, the 2016 TAC needs to be compared to the landings, as the 2016 TAC was not intended to cover all catches, and there was no top-up.

stock in the Kattegat has increased in recent years leading to significant discards of fish above minimum conservations reference sizes (MCRS).

De minimis will only avoid chokes for those fisheries where unwanted catches are minimal. This does not apply to most demersal Kattegat fisheries.

High survival exemptions are not relevant for species with a swim bladder, except, possibly for shallow water fisheries. In recent years, the TAC for Kattegat cod has been set taking into account increasing trends in the stock and in the fishing activity, including estimates of discards above MCRS. With the multi-annual plan for the demersal stocks in the North Sea the basis for TAC-setting will change.

The high degree of uncertainty about the discard level today raises concerns whether a quota top-up based on this information will be sufficient.

Hake (Merluccius merluccius - Union waters of IIa and IV (HKE/2AC4-C))[9]

Type of choke[10]
Category 3

- Scheveningen dataset (2016 landings vs. 2016 TAC): category 3 (HKE/2AC4-C), category 2 (HKE/3A/BCD)
- 2016 catch vs. 2018 ICES advice (whole stock): category 3, but deficit smaller than for HKE/2AC4-C alone

Selectivity statement
Hake in the North Sea is caught mainly in the TR1 (≥ 120mm) mixed demersal fishery. Catches of hake below the MCRS are minimal. Discards tend to be large mature fish, which makes traditional selectivity measures (large mesh size panels) an issue due to losses of target catch and concerns over vessels profitability.

Sharing of information between vessels on the abundance and location of hake has assisted to some extent in reducing unwanted catch.

There is a seasonal large mesh gill net targeted fishery for hake west of Jutland.

Remedial Measures available in the Joint Recommendation

High Survival	Relevant for pot and trap fisheries
De Minimis	Relevant for some specific fisheries to a limited extent
Inter Species Flexibility	Applicable – Depends on the biological status of the stock

Conclusion
Assessed as the Northern Stock, which includes sea areas - Greater North Sea, Celtic Seas, and the northern Bay of Biscay – the stock is within safe biological limits. Catches and levels of discards have increased over time with the increasing spread of Hake into the North Sea. In 2016 Scotland discarded 3997t, which was more than the total North Sea TAC of 3492t.

Improvements in selectivity are unlikely due to the physical size of discarded fish. The problem seems to be primarily the result of a misalignment between the North Sea TAC and a changing spatial distribution of the stock.

Hake, along with other gadoids caught in trawls, do not survive to any reasonable degree and the level of discards would seem to be well beyond the limits for creating a case for *de minimis*. Moreover, the choke issue is due to quota limitation, which would be

[9] Note that there are four TACs referring to this stock (HKE/2AC4-C, HKE/3A/BCD, HKE/571214, HKE/8ABDE.), and the choke categorisation and severity of the quota deficit may differ between individual TACs and the stock as a whole
[10] This categorisation should be treated with caution, as outlined in the introduction of this advice, see p. 4 for details. See Annex IA and IB for data used for choke categorisation.

exacerbated further if a *de minimis* exemption was applied, as the *de minimis* amount would be deducted from the already limited quota.[11]

Interspecies flexibility would remain an option although NSAC is still unclear how this could operate without impinging on relative stability or MSY harvesting.

In response to a special EU request on distributional shifts in fish stocks, ICES concluded that substantial changes that affect TAC management areas had occurred with NS Hake. ICES should now be asked to assess which proportion of the stock resides in the North Sea compared to the rest of the stock area. Hake quota is transferable from adjacent areas (VI, VII, VIII) to the North Sea. Whilst this could substantially mitigate the choke issue for member states with quota shares in both areas, the sum of catches from all areas exceeds the total quota available.

[11] STECF has highlighted that '*any de minimis discard quantities should (and have been) deducted from the catch opportunities arising from FMSY based catch advice',* that combined exemptions for more than one stock are *'likely to reduce the fishing opportunities for all other fleets catching these stocks [, meaning that] any flexibility granted to some groups of vessels could have negative implications for other groups of vessels*', and that therefore Member States '*should be aware it will mean the eventual TAC will be much lower*'. STECF-17-08, Evaluation of the landing obligation joint recommendations (STECF-17-08). Publications Office of the European Union, Luxembourg, 2017, doi:10.2760/149272, pp. 96, 27 and 39..

Ling *Molva molva* (2 TACs, respectively for the Union waters 3a and the North Sea)

Type of Choke[12]
Category 3

- Scheveningen dataset (2016 landings vs. 2016 TAC): category 3 (LIN/3A/BCD), category 2 (LIN/04-C and LIN/04-N combined)
- 2016 catch vs. 2018 ICES advice (whole stock): category 3
- Ling is likely to be a choke species for the TR1 fleet targeting saithe in the North Sea

Selectivity Statement
Ling is solely caught as *unavoidable bycatch* in TR1 operating in deeper water and in TR2 fisheries for *Pandalus borealis*.

The requirements for gear in fishery with ling bycatches entails primarily a 90mm trawl with panels (seltra) in 3a as determined in the EU regulation. It is unlikely further selectivity for ling will be possible.

Remedial Measures available in the Joint Recommendation

High Survival	Relevant for pot and trap fisheries
De Minimis	Relevant for some specific fisheries to a limited extent
Inter Species Flexibility	NA

Conclusion
The advice from ICES is given for the entire ICES areas of 6-9, 12, 3a and 4a. However, in the EU Regulation this is divided into several quotas covering the Skagerrak.

TAC for ling was introduced in 2003 and catches have been stable since. The TAC in 3a is less than 1 percent of the total TAC for the stocks covered by the ICES advice. Due to the small part of the stock in this area it is not economically viable scientifically to determine the exact conditions of this part of the stock nor does it seem to make biological sense to have a separate quota for this fishery.

With the introduction of the landing obligation ling is expected to become a choke species for all fisheries in the Skagerrak and some fisheries in the North Sea. More than 90 percent of ling in the area 3a is traditionally caught in the Skagerrak and the quota is normally exhausted within the first half of the year.

A quota top-up is unlikely to solve the problem as the current discards (and therefore the top-up to be expected in 2019) are lower than the current quota deficit

[12] This categorisation should be treated with caution, as outlined in the introduction of this advice, see p. 4 for details. See Annex IA and IB for data used for choke categorisation.

The NSAC considers that removing the TAC for ling in the Skagerrak in conjunction with a number of conditions may be a valid option. However, this is outside the scope of the present advice and will be further explored in future advice.

Plaice (PLE/2A3AX4)

Type of choke[13]

Category 4 (or possibly 2)

- Scheveningen dataset (2016 landings vs. 2016 TAC): no choke, big surplus
- Scheveningen dataset (2016 catch vs. 2016 TAC): category 2 (small deficit, but was not fully under LO in 2016, therefore only partial top-up)
- 2016 catch vs. 2018 ICES advice (whole stock): no choke, possibly category 2

While this stock appears unlikely to be a choke in relation to the available quota overall (assuming sufficient quota top-up), it could become an economic choke, once all catches that were previously discarded have to be landed.

Selectivity statement

Plaice is caught in both targeted and non-targeted fisheries. The percentage of discards in the catch is higher in the mixed fisheries for sole and for Nephrops using BT 2 and TR 2 gears and low in the targeted fisheries using TR1 and BT 1 gears.

The trawl fishery in the Northern North Sea with significant plaice catches uses mesh sizes above 120mm, this avoids undersized plaice bycatch.

Selectivity trials in beam trawl and pulse fishery for sole (BT2), increasing the mesh size from 80 mm to 90 mm have been unsuccessful with the discard rate in undersized plaice reduced by only 2-3% accompanied by a 40% decrease of catches of marketable high value sole.

Projects using gear mounted cameras have begun to study the escape behaviour of (juvenile) fish to inform the development of more effective escape panels. These panels could be made even more effective using LED lighting or “in gear” dividers/guiders. This work is at early stages of development and results will not be available to influence fishing behavior in advance of January 2019.

Research and trials into reduction of unwanted catch are continuing.

Remedial Measures available in the Joint Recommendation

High Survival	Survival tests are ongoing and final results are not yet available, interim results in the Dutch pulse trawl fishery, show mean survival percentages of 16% with a high variation in results. To increase this to an acceptable level, more experiments to identify which factors influence survival rates are needed.

[13] This categorisation should be treated with caution, as outlined in the introduction of this advice, see p. 4 for details. See Annex IA and IB for data used for choke categorisation.

	Danish survival tests show a survival rate for trawl around 40% and even much higher for gillnet and Danish seine. Survival is to be related to water depth, duration of tow, water temperature, time out of water, season and location. The way nets are constructed also seems to be another significant factor influencing survival rates. The NSAC understands that the Netherlands, Denmark and Belgium are working on a proposal for a (conditional) high survival exemption for their respective fleets and that other country like France are interested to join
De Minimis	Relevant for some specific fisheries to a limited extent. If the brown shrimp fishery is subject to the LO from January 2019 this fishery is likely to request a de minimis for the unavoidable bycatch of undersized plaice in this fishery.
Inter Species Flexibility	Would not solve a type 4 choke

Conclusion

Overall quota limitation is not anticipated to be an issue for this stock. However, allocation of quota top-ups based on relative stability may result in this stock becoming a category 2 choke, with deficits in certain Member States despite an overall surplus. Options for addressing this are outside the scope of this advice.

Despite progress in reducing unwanted catch and understanding survival rates of plaice caught with different gears in different conditions, it is unlikely that this important work involving both scientists and industry will be able to deliver definitive results this year. Additionally, there are sound reasons to believe that catches of plaice will represent an economic choke – when the sheer bulk of catches makes the trip uneconomic.

We are encouraged by the ongoing work being conducted by the Dutch authorities and the NSAC wishes to be involved in this development work. Prior to providing final advice we would require a clearer understanding of the outline of the proposal, specifically on the following:

- Scientific background
- Increased selectivity
- Introduction of fully documented fisheries (FDF)
- Reassessing the MCRS for plaice.

Saithe (Pollachius virens IIIa and IV; Union waters of IIa)

Type of choke[14]
Category 2 or 3

- Scheveningen dataset (2016 landings and catch vs. 2016 TAC): category 3
- 2016 catch vs. 2018 ICES advice (whole stock): category 2, large surplus

Selectivity statement
Saithe have similar physical and response characteristics to haddock. Both seek to move to the upper part of the net, which limits the degree of selectivity that can be put in place in the mixed fisheries. The MCRS for saithe in the North Sea is 35cm, the MCRS for haddock is 30cm.

There has been little, or no selectivity work carried out specifically for saithe.

Remedial Measures available in the Joint Recommendation

High Survival	Relevant for pot and trap fisheries
De Minimis	Relevant for some specific fisheries to a limited extent
Inter Species Flexibility	Applicable – Depends on the biological status of the stock

Conclusion
The majority of saithe discards occur in the mixed demersal fisheries conducted in the Northern North Sea. The solution lies with the possibility of making non-used quota available to those fleets currently discarding. At present, the relative high cost of leasing quota in some countries makes it uneconomic for these vessels to bring the smaller fish to market for sale. Any uplift in quota will be distributed in line with relative stability keys, which will fail to address the choke issue.

The targeted saithe fishery in the deeper northern waters is a relatively clean fishery, although these vessels may face choking by other species for which they have limited quota. The availability of quota, coupled with the absence of any lease costs removes any drivers to discard.

Resolving the choke problem in the saithe fishery revolves around ensuring that the system of quota swaps and transfers works effectively, whilst reflecting relative stability. In this regard the significantly increased TAC in 2017 has eased potential difficulties.

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Seabass

Type of choke

As there is no EU-wide TAC for this stock, the choke analysis cannot be conducted or categorised in the same way as for the other stocks.

Selectivity statement

EU measures designed to reduce fishing mortality of seabass were introduced in 2014 and adapted in 2015 and 2016. As a result, there are no more targeted fisheries using pair trawl and drift net methods. The remaining catch is made in the recreational fisheries, a targeted hook and line fishery and as an unavoidable catch in the mixed fisheries.

The increase in the MCRS to 42cms has encouraged vessels to use more selective gear in the gill net fishery but so far it has not been possible to adapt mobile gears without considerable loss of marketable catch. Against this background, is unlikely that selectivity improvements can be made in time to mitigate a significant choke in the mixed demersal fisheries caused by the regulatory conflict mentioned above.

Remedial Measures available in the Joint Recommendation

High Survival	While there are anecdotal suggestions that seabass could survive after discarding no high survival studies for this stock have been conducted to date. Such studies could be part of a research agenda in a recovery plan but there is currently no scientific evidence to support a high survival exemption.
De Minimis	Allowing up to 5% of the TAC is not a relevant approach because there is no TAC.
Inter Species Flexibility	Not applicable

Conclusion

Catch and bycatch limits in mixed fisheries create a conflict between a requirement to land all seabass and a requirement to return unavoidable bycatch to the sea. The quota flexibilities that are available to species under TAC and quota are not available under catch limits and the various associated derogations.

As options within the joint recommendation to address the choke risk posed by this stock appear to be limited it is recommended that the management approach to seabass should be thoroughly overhauled at the December Council to make it compatible with the landing obligation. It is our intention to submit more detailed advice on this species later in this year.

Skates and rays (covered by the skate group TAC) (2 TACs, respectively for the Union waters 3a and the North Sea)

Type of choke[15]

Category 3

- Scheveningen dataset (2016 catch vs. 2016 TAC): category 3
- Scheveningen dataset (2016 landings vs. 2016 TAC): category 2

Based on the Scheveningen dataset, there was an overall quota deficit in terms of catches in 2016, indicating that under full landing obligation implementation it could be a category 3 choke.

Selectivity statement

Bycatch of skates occurs in all demersal fisheries in the North Sea and the Skagerrak/Kattegat (IIIa) (both static and trawl gears), selectivity devices can be used in some fisheries:

- Escape panels or separator grids can be used to separate out the large bycatch species from small target species (Nephrops, brown shrimp etc). In demersal mixed fisheries where a range of species is targeted mesh size increases and escape panels lead to a loss of target catch.
- Raising the fishing line in fisheries for demersal species that are above the seabed (cod, whiting etc.) greatly decreases the number of ground fish (like rays) in the catch
- Removing tickler chains from trawl gear reduces the bycatch of skates considerably
- In set net fisheries varying the mesh size influences the size of the species caught

The main challenge lies in the demersal mixed fishery for ground fish and *Nephrops*. Here separating within the net is not a desirable option as it would reduce the target catch. More research is needed into avoidance and selectivity measures that avoid or deter skates before they enter the net.

Remedial Measures available in the Joint Recommendation

High Survival	Skates and rays have a strong skin with no scales, lack a swim bladder and are relatively stress resistant (compared to many bony fish species). For some species in a few gears survival studies have been carried out, showing a high survival for the species studied. The Dutch government has put forward a proposal for a temporary (3 year) high survival exemption which is conditional on additional research on all species in all metiers and an

[15] This categorisation should be treated with caution, as outlined in the introduction of this advice, see p. 4 for details. See Annex IA and IB for data used for choke categorisation.

	obligation for operators to implement measures on avoidance, selectivity and survival.
De Minimis	Will not be sufficient to cover the high levels of discarding and would exacerbate rather than improve the choke situation as the *de minimis* amount would be deducted from the TAC so is not an option to alleviate chokes with limited quota.[16]
Inter Species Flexibility	Not applicable

Conclusion

The NSAC supports the proposal for a temporary (3 year) high survival exemption for the North Sea and the Skagerrak/Kattegat respectively under the condition that:

- A clear time path is provided and followed by all contributing Member States on the filling of the data gaps
- It is made clear how the avoidance, selectivity and survival methods implemented by the sector are to be monitored and controlled.

[16] STECF has highlighted that '*any de minimis discard quantities should (and have been) deducted from the catch opportunities arising from FMSY based catch advice',* that combined exemptions for more than one stock are *'likely to reduce the fishing opportunities for all other fleets catching these stocks [, meaning that] any flexibility granted to some groups of vessels could have negative implications for other groups of vessels*', and that therefore Member States '*should be aware it will mean the eventual TAC will be much lower*'. STECF-17-08, Evaluation of the landing obligation joint recommendations (STECF-17-08). Publications Office of the European Union, Luxembourg, 2017, doi:10.2760/149272, pp. 96, 27 and 39.

Whiting (Merlangius merlangus IV; Union waters of IIa)

Type of choke[17]
Category 3 or 2

- Scheveningen dataset[18] (2016 landings and catch vs. 2016 TAC): category 3
- 2016 catch vs. 2018 ICES advice (whole stock): category 3
- 2016 human consumption landings reported in 2018 ICES advice vs. 2016 TAC: category 2

Selectivity statement
The 20mm increase in the large mesh sector (TR1) in 2002 (from ≥ 100mm to ≥ 120mm) improved selectivity of whiting significantly. Nevertheless, discards of whiting remain a significant portion of the whiting catch although this varies significantly between gear type and country.

Whiting is one species where small adjustments to selectivity can be made without overly disrupting the economic performance of the vessel. A number of trials have been on-going in the small mesh, TR2 sector, which has produced a range of national adjustments beyond the minimum required by EU law.

On-going trials are needed and are planned.

Remedial Measures available in the Joint Recommendation

High Survival	Relevant for pot and trap fisheries
De Minimis	Relevant for some specific fisheries to a limited extent
Inter Species Flexibility	Applicable – Depends on the biological status of the stock

Conclusion
Although there has been progress with regard to improving selectivity, further reduction of unwanted catches will take time to deliver. In the meantime, the measures available under the JR are unlikely to prevent chokes.

[17] This categorisation should be treated with caution, as outlined in the introduction of this advice, see p. 4 for details. See Annex IA and IB for data used for choke categorisation.
[18] Note however, that it is unclear why this dataset excluded the Netherlands which also have a share of the TAC, and to what extent this affects the category or extent of the choke situation.

Overall Summary and Conclusions

The Joint Recommendation and subsequent Delegated Act for 2019 (JR/DA) are important. For some fisheries and species, the measures available under the JR/DA will go a substantial way to mitigating the risk of chokes in mixed fisheries.

High Survival and *de minimis* exemptions will be necessary where indicated. In some cases, interim exemptions with conditions that allow for the collation of data for more permanent solutions, within a defined timetable, may be necessary.

It is clear however that on their own, the JR/DA will not be sufficient to eliminate the risk choke risk in the North Sea demersal fisheries and that further actions by the Council of Ministers and possibly the co-legislators may be required. The NSAC will provide further advice on these later this year.

Although many choke issues remain outstanding we concur with the Scheveningen Group's assessment that working collaboratively with the advisory councils will be the best way to find solutions. A robust, reliable identification of potential chokes (including the likely category and extent) for 2019 and beyond, is essential in this context.

Annex 1

For the purpose of the present advice, we have tried to conduct a choke analysis for North Sea stocks where based on industry perception chokes may occur in 2019. For this purpose, we compared 2016 catch data with the 2016 TACs, based on a dataset provided by the Scheveningen group (referred to as the 'Scheveningen dataset' throughout this advice)[19]. However, this has revealed a number of issues, which mean that the choke categorisation presented in this paper and any conclusions drawn on this basis need to be treated with caution:

There appear to be discrepancies in the landings, catch and discard data originating from different sources (STECF, ICES, FIDES). A full assessment of the reasons for and the extent and implications of these discrepancies was outside the scope of this advice. However, these need to be explored further in order to ensure that any potential choke categorisation is based on reliable data.

- The most recent catch data are from 2016, when many stocks were not yet or only partially under the landing obligation. Therefore, such TACs were not meant to cover all catches, but were essentially landings-TACs with a partial quota top-up. Comparisons of such TACs with the overall catch data would overestimate choke issues, whereas comparisons with the landings data in turn might underestimate them, as this would not mimic a 'full landing obligation'-situation where all catches have to be landed.

- The dataset refers to the situation in 2016, which may have changed in the meantime, in terms of stock situation and quota availability. This means the identified choke categories and the severity of choke issues may be different now (and in 2019) than based on the 2016 data.

Therefore, the results of this analysis are sometimes ambiguous and only indicative of potential choke issues, rather than allowing for a definite conclusion. We are presenting the data from the Scheveningen group for all stocks covered in this advice, and some additional information based on the most recent ICES advice for 2018, in Annex IA and IB, in order to provide an idea of the quota deficit or surplus in 2016 (overall and by Member State). The choke categorisation presented in the stock-specific sections of this advice is based on this information. However, this information as well as the resulting choke categorisation need to be treated with caution for the reasons outlined above.

[19] Dataset titled ‚Choke species analysis, version 2018.03.01.xlsx', shared with the NSAC on 27 March 2018. Referred to as 'Scheveningen dataset' throughout this document.

Annex IA:

Data provided by the Scheveningen group for TACs covered by this NSAC advice, including Member State specific data on TAC share, 2016 catch, discards and landings in t, as well as the TAC deficit (negative, red cells) or surplus (positive, green cells) in relation to catches and landings, respectively. Data were taken unchanged from the dataset provided by the Scheveningen group, but sums across all Member States were calculated per TAC to provide an overview (grey cells). Landings data were not included in the dataset but calculated as the difference between catch and discards. The TAC deficit and surplus values were calculated as the difference between the TAC share and the catch, and landings, respectively. * Note that it is unclear why the Scheveningen dataset excluded the Netherlands for WHG/2AC4, although they do hold a share of this TAC, and what the implications of this omission are for the choke categorisation and extent.

Species	TAC	Member State	2016 TAC share in t	2016 catch in t	2016 discards in t	2016 landings in t	TAC deficit or surplus in t in relation to catches	TAC deficit or surplus in t in relation to landings
Cod	COD/2A3AX4 and COD/04-N	BEL	994	1341.27	233.7	1107.57	-347.27	-113.57
		DEU	3622	2159.49	68.04	2091.45	1462.51	1530.55
		DNK	5713	9749.27	477.59	9271.68	-4036.27	-3558.68
		FRA	1228	464.05	68.55	395.5	763.95	832.5
		NLD	3228	1336.64	62.64	1274	1891.36	1954
		SWE	420	386.03	15.88	370.15	33.97	49.85
		UK	13107	24442.97	7870.07	16572.9	-11336	-3465.9
		All	28312	39879.72	8796.47	31083.25	-11567.7	-2771.25
	COD/03AN	BEL	12	0	0	0	12	12
		DEU	96	109.3	14.54	94.76	-13.3	1.24
		DNK	3846	4121.07	1050.94	3070.13	-275.07	775.87
		NLD	24	24.33	2.33	22	-0.33	2
		SWE	673	911.15	267.48	643.67	-238.15	29.33
		All	4651	5165.85	1335.29	3830.56	-514.85	820.44
	COD/03AS	DEU	5	0	0	0	5	5
		DNK	228	368.87	186.2	182.67	-140.87	45.33
		SWE	137	149.64	36.29	113.35	-12.64	23.65
		All	370	518.51	222.49	296.02	-148.51	73.98
Hake	HKE/2AC4-C	BEL	50	67.27	8.29	58.98	-17.27	-8.98
		DEU	232	815.38	12.99	802.39	-583.38	-570.39
		DNK	2018	5547.95	103.63	5444.32	-3529.95	-3426.32
		FRA	447	2188.06	45.56	2142.5	-1741.06	-1695.5
		NLD	116	72.47	17.47	55	43.53	61
		UK	629	11114.55	4046.2	7068.35	-10485.6	-6439.35
		All	3492	19805.68	4234.14	15571.54	-16313.7	-12079.5
	HKE/3A/BCD	DNK	2762	788.89	150.49	638.4	1973.11	2123.6
		SWE	235	63.58	14.3	49.28	171.42	185.72
		All	2997	852.47	164.79	687.68	2144.53	2309.32
Ling	LIN/3A/BCD	BEL	6	0	0	0	6	6
		DEU	6	0.87	0.01	0.86	5.13	5.14
		DNK	50	76.65	1.38	75.27	-26.65	-25.27
		SWE	19	19.83	2.74	17.09	-0.83	1.91
		UK	6	0	0	0	6	6
		All	87	97.35	4.13	93.22	-10.35	-6.22
		BEL	28	19.01	5.14	13.87	8.99	14.13

	LIN/04-C and LIN/04-N	DEU	213	95.28	0.05	95.23	117.72	117.77
		DNK	1455	1352.55	0.7	1351.85	102.45	103.15
		FRA	175	317.91	8.69	309.22	-142.91	-134.22
		NLD	8	0	0	0	8	8
		SWE	12	11.39	0	11.39	0.61	0.61
		UK	3016	3746.29	1190.13	2556.16	-730.29	459.84
		All	4907	5542.43	1204.71	4337.72	-635.43	569.28
Plaice	PLE/2A3AX4	BEL	7538	11209.15	4534.84	6674.31	-3671.15	863.69
		DEU	7067	9847.7	5632.71	4214.99	-2780.7	2852.01
		DNK	24499	20463.56	1615.11	18848.45	4035.44	5650.55
		FRA	1414	356.28	182.44	173.84	1057.72	1240.16
		NLD	47112	59838.46	28409.46	31429	-12726.5	15683
		UK	34864	21143.52	2368.67	18774.85	13720.48	16089.15
		All	122494	122858.7	42743.23	80115.44	-364.67	42378.56
Saithe	POK/2A34-N	BEL	23	18.18	2.63	15.55	4.82	7.45
		DEU	6825	6334.48	24.37	6310.11	490.52	514.89
		DNK	2703	6088.16	249.59	5838.57	-3385.16	-3135.57
		FRA	16062	11164.83	119.01	11045.82	4897.17	5016.18
		NLD	68	116.51	7.51	109	-48.51	-41
		SWE	1251	1313.86	88.73	1225.13	-62.86	25.87
		UK	5232	18591.76	10052.85	8538.91	-13359.8	-3306.91
		All	32164	43627.78	10544.69	33083.09	-11463.8	-919.09
Skates and rays	SRX/2AC4-C	BEL	221	230.41	48.06	182.35	-9.41	38.65
		DEU	11	10.95	0	10.95	0.05	0.05
		DNK	9	7.2	4.55	2.65	1.8	6.35
		FRA	35	1.88	0	1.88	33.12	33.12
		NLD	188	412.83	161.83	251	-224.83	-63
		UK	849	2680.33	2039.82	640.51	-1831.33	208.49
		DNK	37	4.21	0	4.21	32.79	32.79
		SWE	10	0	0	0	10	10
		All	1360	3347.81	2254.26	1093.55	-1987.81	266.45
Whiting	WHG/2AC4 and WHG-04-N	BEL	270	744.09	679.02	65.07	-474.09	204.93
		DEU	304	200.17	129.12	71.05	103.83	232.95
		DNK	1167	5540.42	701.22	4839.2	-4373.42	-3672.2
		FRA	1754	1962.18	696.91	1265.27	-208.18	488.73
		NLD*	NA*	NA*	NA*	NA*	NA*	NA*
		SWE	192	7.18	1.55	5.63	184.82	186.37
		UK	8438	15363.09	5948.3	9414.79	-6925.09	-976.79
		All	12125	23817.13	8156.12	15661.01	-11692.1	-3536.01

Annex IB: Information on 2016 catch and landings and 2018 ICES advice for catches and landings, based on the most recent ICES advice (hyperlinks provided in the first column).

Stock	Catch 2016 in t	Landings 2016 in t	Catch advice 2018 in t	Landings advice 2018 in t	Catch advice 2018 minus catch 2016 in t	Landings advice 2018 minus landings 2016 in t
North Sea cod	50544	38240	53058	35725	2514	-2515
Kattegat cod	521	299	772	254	251	-45
Northern hake	118644	107530	115335	104060	-3309	-3470
Ling	20867	19269	17695	16793	-3172	-2476
North Sea plaice	135950	91959	142481	96266	6531	4307
North Sea saithe	78715	68113	118460	103731	39745	35618
North Sea whiting	33759	15854	26191	13799	-7568	-2055