REPORT
NSAC Landing Obligation Workshop

Meeting: Landing Obligation Workshop – North Sea perspective
Parties: NSAC members and invited external participants
Date: 17-18 January 2023
Time: 12:00 - 18:00 CET (17 Jan); 10:00 - 12:00 (18 Jan)
Location: NH hotel Berlaymont, Brussels
Moderator: Mogens Schou
Rapporteur: Fiona Birch (Mindfully Wired Communications)

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1. Introduction

The North Sea Advisory Council (NSAC) workshop on the functioning of the Landing Obligation (hereafter LO) took place on 17-18 January 2023 at the NH Berlaymont hotel in Brussels.

The workshop featured a variety of stakeholders within and external to the NSAC who explored the state of play, experiences, and challenges posed by the LO and possible ways forward. The aim was to produce advice to the European Commission in light of the upcoming report on the Common Fisheries Policy (CFP) and beyond. The purpose of the workshop was

not to question the LO itself, but to identify its shortcomings and actions that could render it more efficacious and pragmatic.

The first day of the workshop was open to all interested parties, the second day was for NSAC members only to develop recommendations.

2. Workshop Proceedings – Day 1 (NSAC and stakeholders)

2.1 Opening Remarks

The workshop was opened by **Kenn Skau Fischer**, Chair of the NSAC Executive Committee.

A decade has passed since the LO was first integrated into the CFP (from 2013). Article 15 of the CFP outlining how an obligation to land all catches of species subject to catch limits will be implemented throughout EU waters.

The NSAC LO workshop was timely in light of the upcoming report on the functioning of the CFP as well as an evaluation of LO exemptions planned for 2023 by the Scientific, Technical and Economic Committee for Fisheries (STECF). These exemptions are crucial for making the LO workable.

The workshop was moderated by **Mogens Schou**. Schou is a partner at AquaMind, advising on fisheries management. He conceived the concept of Catch Quota Management with Fully Documented Fisheries (FDF) and has participated in the negotiations of the first Common Fisheries Policy 1983, and all subsequent revisions of the CFP.

2.2 Introduction to the Workshop objectives and participants

The Moderator introduced the intentions for the workshop. It would provide a forum for productive ideas, solutions, and discussions on the implementation of the LO. Workshop attendees represented the full breadth of fisheries stakeholders, namely fishing industry representatives, Other Interest Groups (OIGs), scientists, and Member States and managers.

3. Setting the scene

Nis Christensen, Fisheries Director of Denmark and Chair of the Scheveningen Group for 2023, provided an introduction to the LO from a management perspective.

The introduction of the LO in 2015 created a huge step change in how fisheries operate in the EU. It is far from perfect and will require more work for many years to come. From the Danish side, he was grateful for the NSAC's work and commended the advice on CCTV and remote electronic monitoring (REM), which has been very useful.

Denmark is chairing the Scheveningen Group in 2023. The Scheveningen Group consists of a High Level Group, Technical Group, Control Expert Group, and Fish-Envi Group. The work programme for 2023 includes: the joint recommendation for all exemptions, as the current discard plan expires at the end of 2023; amendment to the current discard plan exemption

from the LO on experimental fisheries; technical measures; control; Marine Protected Areas (MPAs); the Commission's evaluation of the CFP; and the EU post-Brexit context.

Speaking from the Danish standpoint, he listed his personal observations on the LO: Close cooperation between stakeholders is important for the implementation of the LO, including Regional Groups, Advisory Councils, the Commission, and STECF; the all-important exemptions will be scrutinised in 2023, however, the scientific requirements underpinning these remain unclear; the development of "smarter" fisheries must be considered and scientific research on selectivity must be facilitated; examples of the process for derogations include the approval of selective gear in the Baltic Sea, which is still underway after 18 months of work; excluder devices in Norway Pout fisheries, which were approved after a 24 month long process; and experimental fisheries, which are not exempted from the LO.

With regards to the control of the LO, he reflected that traditional control measures do not provide sufficient coverage and are costly. Thus, he felt that camera surveillance and REM could be a way forward, provided that a level playing field is established across the EU's fleets. Incentives for effective control would also be important, and he suggested more flexible rules around gear types and adoption of less traditional control measures (e.g. last haul).

Data from the Danish Kattegat project looking at the effectiveness of camera surveillance in cod, hake, and haddock fisheries showed that discarding was significantly lower when camera surveillance was in place. This project gained considerable attention and was controversial among the fishing industry. He noted that politicians look to other countries to understand the approaches that are being used, thus, he reiterated that establishing a level playing field is important.

He concluded that to move forward with the LO, the development of selective gears and fishing methods must be accelerated. He believed that FDF would provide the solution for a modern control measure as part of the LO.

3.1 Attendee comments

A fishing industry representative touched on Christensen's suggestion that the LO has "changed the way we fish", instead insisting that it has "changed the way we manage fisheries". The attendee highlighted that the LO does not give fishers the freedom to avoid discards, creating a mismatch between the intention of the LO and fishers' ability to adapt to the regulation. The challenge is to make this mismatch smaller. To achieve this, fishers need more freedom to avoid discards.

4. Breakout session: Practical experiences and observations of stakeholders

To inspire discussions, each stakeholder group (1. fishing community; 2. managers and Member States; 3. OIGs; 4. scientists) was invited to review a questionnaire developed by the NSAC.

The key questions that the attendees were asked to answer were: *what do you see as the two-three major challenges for the implementation of the LO?* and secondly: *what is your take on solutions that may offer better implementation of the LO, while also developing the LO as an economic benefit for fishers? The Basic Regulation stands.*

Within the basic LO regulation, there are opportunities to devise new solutions. Attendees were therefore encouraged not to present problems without also sharing solutions. Breakout groups facilitated discussion within stakeholder groups.

Following the workshop, attendees would be invited to supplement their inputs in writing if desired. The aim was to produce an NSAC advice recommendation informing the implementation of the CFP, with specific detail on the LO.

Following the separate discussions, a representative from each stakeholder group reported on the key points raised and the conclusions made, to all attendees present.

4.1 Report from the fishing community

Representatives from the fishing community voiced that one of the greatest challenges associated with the LO is the slow, existing management system. This typically results in delays to total allowable catch (TAC) setting and mismatches between the TACs and catch compositions, which can be poorly aligned with fisher observations at sea. Furthermore, quotas are not always guaranteed to be set in line with scientific advice or stock status, as has been the case for haddock. A faster management system is therefore desired; one that can adapt more quickly to meet the needs of fishers.

The implementation of new gears to improve selectivity was also posed as a key challenge. Thus, greater flexibility in the use of gear was called for. It was also suggested that if quotas are not set in line with MSY advice, flexibilities should be permitted. The flexibility measures that are written into the regulation are poorly used at present, and there is scope to employ these more effectively.

It was highlighted that the LO is not fit for purpose in mixed fisheries because these fisheries rely on the exemptions to be able to adhere to the obligation. These exemptions also take time to develop and implement. Further issues include the level of discards generated through lack of quota or bycatch in targeted fisheries, and the fact that the LO is biased towards demersal fisheries. A fundamental flaw is that the LO was defined as a target rather than a means of reaching a target.

The causal link between the LO and choke species was emphasised. This can have huge implications for vessels and significant time and energy is spent dealing with this problem. Establishing a TAC for a restricted number of species that pose a choke risk, and then registering the remaining stocks without any restrictions would help to mitigate the effects of choke situations.

Issues pertaining to the ownership of fisheries data were emphasised, including the protection of privacy and access to data.

With regards to possible solutions to some of these concerns, it was felt that CCTV could hold promise if used on a voluntary basis and subject to positive incentives. One possible incentive could include extra quota for vessels engaging in CCTV monitoring, but it was noted that additional positive incentives would also be needed. The final decision on whether to use CCTV should lie with fishers on an individual basis, rather than with regulators. Focusing

efforts on selectivity rather than mesh size, would allow fishers to reach their objectives. Another possible solution to be explored is establishing third party control at the point of landing.

4.2 Report from managers and Member States

The managers and Member States group commented on the challenges associated with maintaining the LO as an instrument to increase selectivity, as opposed to it being thought of as an objective. It was emphasised that the effective implementation of the LO requires a balance between improving selectivity and avoiding choke situations. There is also a clear lack of support for the LO from fishers who face difficulties in implementing it. Conflicts with other policy areas also exist, such as labour rights.

The annual exemption cycles are problematic, leading to stakeholder fatigue. Instead, multiannual exemptions might be more appropriate, which can integrate greater flexibility in the gear types available, and the exemptions on offer.

The unavoidable time lag between data collection and quota setting was a concern. The group noted the importance of ensuring that the right data is collected and, ultimately, the right advice is set. Furthermore, the scientific basis for the implementation of the exemptions can often be difficult to determine, particularly for survivability, for which robust data is challenging to collect. Profit margins are too small for fisheries experimenting with new gears and there are no incentives to participate, meaning the LO is hampering fisher participation in vital research projects.

The use of REM as a tool for data collection and control was emphasised as a contentious issue, with different stakeholder groups, particularly fishermen, possessing strong views on its use.

It was noted that the Commission is not aware of the full range of projects that are working to address aspects of the LO, and so more attention should be paid to ensuring the findings of these projects are properly communicated.

Concerns around food safety and the spoiling and contamination of fish were also raised.

The proposed solutions included improved cooperation between managers and industry, particularly regarding the provision of data to contribute to the International Council for the Exploration of the Sea (ICES) advice process. Technological solutions, such as trawl monitors, were also put forward – these can help to inform fishing decisions and provide data for stock assessments. It was emphasised that data collection is essential for developing a better understanding of fish stocks, which can in turn contribute to a reduction in choke risk.

On fisheries governance, positive incentives are required to encourage adherence to the LO, for example, intra-annual flexibility and quota top-ups. There was support for REM, which has the potential to give the industry greater liberty and accountability to manage their own fishing practices through a free enterprise approach, whilst simultaneously supporting data collection. Finally, EU-wide initiatives, such as EFCA and other relevant applications and tools, can support the creation of a level playing field between countries.

4.3 Report from the OIGs

The OIG representatives emphasised their aspiration for the LO to be used as a means (rather than a goal) to minimise unwanted fishing mortality. The most significant challenges are around non-compliance, particularly for mixed fisheries, a lack of incentives, and a lack of control.

The possible solutions proposed included making REM mandatory for high risk vessels, supporting the digitisation of the fleet, and improving access to the European Maritime, Fisheries and Aquaculture Fund (EMFAF). The group was also in support of quota top-ups if fishers can demonstrate compliance with the LO.

The OIGs recommended that managers should set fishing opportunities at levels that account for non-compliance with the LO, and that they should actively ask fishers to follow the scientific advice.

Participation of the fishing industry in collaborative research would promote ownership, enhance the role of fishers in data collection, and facilitate information sharing.

The group concluded by sharing approaches through which OIGs can offer their support. These were: using resources to support the facilitation of LO partnerships and research; advocating for policy and technological solutions; promoting co-management and participatory schemes; championing best practices; and working with and supporting the end users of the LO.

4.4 Report from the scientific community

The representatives from the scientific community highlighted several challenges for the implementation of the LO. It was noted that, thus far, the LO has been implemented half-heartedly. A possible solution could be to enforce the LO in its current form, or alternatively, return to technical gear rules.

Continuation of prescriptive gear regulations is also difficult. An alternative may be through embracing FDF and promoting free gear choice for fishers.

With regards to the exemptions, a key challenge is that switching gears results in the loss of an exemption. It can also be difficult to keep track of exemptions because clear rules and definitions are needed for their establishment. The application of exemptions to regions rather than individual Member States, was suggested.

A paucity of data on catches for a species can lead to poor knowledge, poor advice, and poor implementation of the LO. A possible solution to this could involve developing log books that harness real-time data. They also noted the implications of TAC constraints and the knock-on effects for choke species – haddock, which is quickly becoming a choke species due to the application of maximum sustainable yield (MSY) targets in demersal mixed fisheries, was referenced.

Further challenges exist around setting biodiversity thresholds. These targets are poorly coordinated with fisheries and other marine spatial planning considerations, such as marine

protected areas and offshore renewable energy developments. A holistic management approach is therefore essential.

Sensitive species and data-limited stocks that exist below reference levels require special protection. Real-time closures could provide a possible solution, however, spatial data is needed to inform this approach, as well as national scale monitoring of bycatch.

The importance of economic and social considerations, and the need to expand open access databases on socio-economic data, were emphasised.

5. Alternative management systems

5.1 Norwegian perspective

August Fjeldskår from the Norwegian Fishermen's Association presented his experiences of Norway's discard management system. He began fishing at the age of 17 and now owns two boats, which he fishes with his son. He targets cod from the Barents Sea when the fish migrate to spawning grounds along the Norwegian coast. According to Fjeldskår, one of Norway's best management decisions taken in the recent past was the closure of cod spawning areas to fishing when the stock fell to a low level. This allowed the stock to recover successfully.

He reflected that it is easier for Norway to develop its own policies, as it is not bound by EU legislation. The biggest difference between the LO and Norway's discard ban is that in Norway, before quotas are shared between vessels, a small amount of each vessel's quota is removed in order to account for situations where a vessel goes over or under its share. Where a vessel takes less than its share, it is permitted to harness extra capacity to top-up its quota by targeting other species, thereby switching fisheries. When a vessel goes above its quota, it can still land the excess fish, however, the government receives 80% of the money from the sale, while the vessel receives 20% to cover the likes of fuel costs. The scheme has been highly successful in Norway.

Norwegian fishing vessels also transmit live data to research institutions on a daily basis so that scientists can collect real-time information on the location of fish and fishing vessels.

He concluded that the system works well for both stocks and fishermen. He reiterated that fisheries and seafood is an important part of Norway's culture and economy, and that the best life anyone can lead is on the sea.

5.2 Attendee comments

A fishing industry representative asked if REM or CCTV has been discussed as a potential approach for data collection and control in Norway. Fjeldskår replied that the Norwegians have heard about the use of CCTV in fisheries, but decided to not act on it. There is an offshore coastguard for enforcement purposes and it is rare for fishers to disregard the rules.

Another member of the fishing community observed that because a system has been developed that works for fishermen, the need for control is reduced. Fjeldskår confirmed this to be true.

5.3 Icelandic perspective

Thorsteinn Hilmarsson from the Directorate of Fisheries in Iceland shared his perspective on the Icelandic LO.

Iceland's Exclusive Economic Zone is 760,000 km². Its fishing fleet contains more than 1,000 vessels across 63 harbours, with annual catches of 1.1-1.6 million tonnes.

Iceland has used an Individual Transfer Quota (ITQ) system since 1991. The law on discarding has been in place since 1996. It stipulates: all catch must be retained and landed; exceptions can be made for releasing live catch under a specific length or weight or caught using certain types of fishing gear; exceptions are also possible for fish of no economic value, entrails, heads, and other waste when processing on board. Exemptions are also in place for salmon, sharks, and some flatfish and rays.

The Icelandic management system encourages vessels to land everything they catch. It allows 15% of each vessel's catch quota to be transferred to the following fishing year, and 5% to be caught in excess of a vessel's catch quota, which is then deducted from next year's quota. Undersized fish are only partially withdrawn from catch quotas.

Alternatively, vessels may land up to 5% in excess of quota. The fish goes to market and 80% of the monetary value from the catch goes into a special development fund, while the remaining 20% goes back to the fishermen to cover the costs of bringing the catch to land.

There is a requirement for each vessel to catch at least 50% of its catch quota, while the remaining 50% can be bought and sold. There are no special rules on bycatch. He said: "technically there is no such thing as bycatch because everything is landed".

Annual scientific recommendations on TACs are published in June, with consultations held in July. Catch quotas are then published in September and are valid for the ensuing year.

There is a strong culture of transparency, cooperation, and trust when it comes to landings in Iceland. Catches are weighed upon landing by certified weighers who operate independently of both the seller and the buyer. The quota is balanced for each vessel after each trip and open access, real-time information is available online on landed catch and quota status. Any infringements and sanctions are published publicly, thereby "naming and shaming" wrong doers. Fisheries administration have been shown to be transparent, efficient, and trustworthy, thus they are well regarded by fishers. This encourages stakeholders to cooperate with the authorities.

He highlighted an example in which developing a new market had helped the industry to overcome landing issues for lumpfish. Lumpfish roe is of commercial importance for the production of caviar, but in order to supply the roe, the fish has to be landed. To overcome this challenge, an export market for lumpfish was developed with China. The new market for lumpfish has been so successful that in some years, the fish has become more valuable than the roe.

To encourage adherence to the regulation, the Directorate of Fisheries undertakes statistical analysis on discard risk by vessel. This risk analysis can help to identify discards or suspicious

behaviour. Any vessel showing suspicious behaviour will need to pay for an on-board observer from the Directorate of Fisheries, thus leading to an increased cost for the vessel in question. The publication of the risk register has also been shown to deter illegal activity.

The Directorate of Fisheries and the Marine Research Institute Iceland (MRI) have collaborated on sampling for size related discards since 2001. The results indicate that discarding is at approximately 3-5%.

The use of drones for fisheries surveillance was legalised in Iceland in July 2022. Hilmarsson noted that the rules of use must consider issues regarding data protection and privacy. Data on drone surveillance is also due to be published to assist with enforcement.

5.4 Attendee comments

A member of the fishing community asked for more information on the 50% of catch quota that can be bought and sold. Hilmarsson explained that this gives greater flexibility in the use of quota and an open market between businesses exists.

Another fishing representative questioned whether the discard figures provided in his presentation are all quota species. Hilmarsson replied that the data indicating that discard rates fall between 3-5%, pertains to cod fisheries.

An OIG representative inquired as to why the Directorate counts half of undersized fish, and whether it is sold for commercial purposes. They went on to ask if measures are in place to deter catches of undersized fish. Hilmarsson explained that there is a market value for small fish in Iceland. The lower prices for smaller fish are compensated by meeting quota. Catches of undersized fish are deterred by establishing closed areas where juveniles are found in large numbers. The details of these closed areas are subsequently communicated via state radio on Channel 1, following the weather update. It is incredibly quick, with measures being implemented within 1 hour.

An attendee from the fishing industry queried whether Iceland has considered using CCTV as an enforcement measure. Hilmarsson confirmed that he is running a pilot project on its use in fisheries.

An attendee asked if the Directorate is faced with criticism in response to the use of drones. Hilmarsson answered that there has been a lot of discussion about drone use during the trials of the past two years. The Parliament was flexible in terms of their deployment in fisheries, but there was a big majority of fishermen who were against their use. He felt that drones are an extension of traditional surveillance. He added that fishers are normally unaware of the drones, and the drones will only start filming if discarding is being observed.

6. Identification of common challenges for implementing the LO

The Moderator opened the floor to a general discussion on the common challenges associated with the implementation of the LO.

The key points that arose from this discussion included a conversation around timelines and the lack of timely reactions from EU managers. One attendee from the fishing industry

observed that in Norway and Iceland, measures can be implemented within an hour, whereas in the EU, it takes a year to implement a delegated act on more selective gears due to requirements for input from scientific institutes and internal deliberation within the Commission. Speeding up this process would benefit all.

It was also suggested that the 80%/20% management system for dealing with excess quota should be given due consideration by the Commission, in addition to payment for cooperation of fishers. However, questions remained around utilisation of quota that falls short of the 50% catch quota threshold.

Another participant from the fishing industry highlighted that the LO has been in force for 10 years, however, fishers have still not bought into the process. The industry thinks of the LO as a hindrance rather than an advantage, and they are not willing to defend it. Time and time again, the NSAC has communicated that fishermen do not believe in the LO, and so changes are necessary.

Building on this intervention, the discussion turned to explore how successful stakeholder buy-in has been achieved in Norway and Iceland.

It was highlighted that in Iceland, the process is entirely transparent. Data is published in real-time and so fishermen have no reason to suspect unfair treatment. Fishermen trust the measures and understand why they are in place. Furthermore, the Icelandic fisheries minister will be criticised if he/she does not abide by scientific advice. Icelandic fishers believe: “it’s better to have a share in something that is becoming more valuable, as opposed to something that is becoming less valuable.”

In Norway, fishers have no intention of removing the discard ban. They live with it and believe that it is good for the future sustainability of Norway’s stocks and fisheries.

7. Technological solutions

John Reidar Mathiassen from the research company SINTEF, shared the latest information from the EveryFish project – a Horizon Europe research project with 17 partners from 8 countries that commenced in January 2023 and will run to December 2026. The former SMARTFISH project, which concluded in 2022, was the precursor to EveryFish. EveryFish contains six work packages (WP), of which SINTEF leads WP 4 on technological solutions for automatic catch recording. The project’s ultimate goal is to contribute to the digital transition of catch monitoring in European fisheries.

EveryFish aims to improve real-time data collection on catches through Artificial Intelligence (AI), by developing automatic catch registration technology that enables key metrics (e.g. species, weight, and size) to be measured once a fish has been caught. This technology requires on board handling, AI, and camera systems to be effective. Reidar Mathiassen showed a video demonstration of “CatchScanner” and “CatchMonitor” technology at work – the former uses a laser to collect data on individual fish as they pass under a camera along a conveyor belt; the latter uses cameras to identify fish according to species-specific characteristics.

The concept behind EveryFish involves using AI for species recognition. Over time, AI can learn to attribute images of individual fish to their species. It may require several hundreds of thousands of examples to make this association, which can be achieved by generating datasets with hundreds of thousands of images using digital twins of fish. There is an element of bias in AI because it learns what an individual teaches it. Therefore, thorough training of the system is needed before application to European fisheries at large.

EveryFish has attained 98% accuracy in identifying more than 20 demersal species. For similar species, such as lemon sole and common dab, the technology is less accurate. Limitations include the overlapping of fish on conveyor belts, which makes it more difficult to identify individual species, and the challenges of real-world conditions.

The data collected can be reported to fisheries managers and/or scientists in real-time to help inform quota status and real-time closures. The analysis also has the potential to inform marketing and technology.

He concluded that AI holds promise for developing solutions in fisheries management. The question is how to apply the solutions in a way that is compatible with the interests of industry, management, fishers, and fish stocks. EveryFish hopes to provide answers to these questions.

7.1 Attendee comments

A workshop participant queried whether morphological data on fish is being used in EveryFish's species recognition technology. Reidar Mathiassen confirmed that this information was in the process of being integrated.

8. Fully Documented Fisheries (FDF) and Automatic Image recognition

Pim Visser from the Den Helder BluePortCentre, presented updates from a research project on FDF in Dutch demersal fisheries.

He commenced by sharing his personal conclusions: "fully documented fisheries are not fit for human consumption and are doomed to fail without the proper use of AI." Having undertaken two best practice research projects spanning from 2013-2018, he remarked that the LO is not practical, compliable, nor enforceable in Dutch demersal fisheries.

Visser articulated that CCTV is presented as a panacea to the problems of the LO, but it is nevertheless controversial. Accurate registration of all catches is necessary, however, previous projects have concluded that good estimates are impossible using traditional methods. He noted that CCTV is a monitoring tool as opposed to a control tool, and that FDF do not have to be defined by camera control.

The FDF research programme was established by VisNed and Wageningen University during 2020-2022, and has since moved to the BluePortCentre Den Helder. Control authorities are not involved in the research, thus it is an example of industry-science collaboration. The programme was established on the basis that the LO is only workable because of the exemptions. However, it is thought that a reliable registration system that can operate at sea could provide an alternative means of reaching FDF.

Practical participation of the fleet has been essential for this research. Forward thinking skippers were keen to participate, but crews were afraid of privacy breaches and an increased workload. Thus, fishers were compensated for their participation and given ownership of the data collected.

Jurgen Batsleer from Wageningen Marine Research, took the floor to explain the scientific elements of the project. Cameras were installed on vessels with the capability to stream snapshot images of catches to scientists at Wageningen University, who would use this information for species identification and to extrapolate catch weights and other metrics.

Several iterations of electronic monitoring were trialled, including object tracking and deep learning, which proved to be 80% successful at recognising fish.

The project is currently conducting trials at sea to ensure the technology is robust and to explore species classification and weight registration. This should help to improve data acquisition and training, innovate new algorithms, and integrate 3D visualisation.

Pim Visser concluded by highlighting several important considerations: participation and liaison of the fishing fleet is essential for operational results; a large sample of images must be analysed; and computer services must be well managed.

He reiterated his personal conclusions and highlighted his commitment to finding a practical alternative to Article 15. Discussions on a post-2024 North Sea wide approach would be relevant for achieving this.

8.1 Attendee comments

A workshop attendee asked if it is possible to register and identify all species caught in a mixed fishery beam trawl haul, using the technology. Batsleer confirmed that this is possible with approximately 95% accuracy. The small fish that are obscured beneath the larger fish will not be recognised.

9. Reflections and recommendations

Each group of stakeholders was invited to reflect on the discussions and outline possible solutions and recommendations.

The **OIGs** highlighted that the workshop had not explored solutions to improve the implementation of the LO, such as flexibilities and gear amendments. Rather, the majority of the discussions had focused on alternative approaches. The LO can be implemented in various forms within the CFP framework, and the current method of implementation through Article 15 has scope for improvement. They stressed that thinking about what could be, as opposed to what should be, could help progress.

The OIGs also felt that FDF and the involvement of Member States should be given increasing importance going forward. They registered their interest in the transparency measures at play in Iceland, and suggested consideration of similar approaches by the EU Commission.

In response, a fishing representative outlined that there will be a discussion about the framework regulation in 2023 and that the Commission is drafting a report on the functioning of the CFP. Therefore, a full review of the LO could take at least five years. Specific approaches to modify Article 15 may help to bring the LO into the modern day.

The **scientific community** proposed incentivising adherence to the LO within the EU. They were in support of measures accounting for the over- or under-shooting of quotas, and where undersized fish count less towards quota than more marketable fish. Incentives have the potential to play into FDF, which in turn could give fishers more flexibility to choose their gears. They observed that ownership of data and its use (i.e. control versus scientific data collection) would need greater consideration, as would the establishment of boundaries to ensure it is being used for the purpose it was originally intended.

The **fishing community** asserted that the LO is a complex regulation with few benefits. The industry is strongly against the use of CCTV as a control measure and proposed a CCTV exemption. They felt that CCTV and exemptions go hand-in-hand. In addition, they indicated that participation of all stakeholders is crucial, particularly to promote FDF, which has significant potential. They suggested creating dedicated FDF ambassadors to endorse the system, but again conveyed that they were wary of using CCTV to achieve FDF.

Regarding AI and catch identification, the industry noted that the technology is progressing at a high speed, and therefore, coordination between Member States, research institutes, and industry will be critical. They felt that the workability of AI solutions is still questionable, and went on to note that catch scanners would be favourable over the use of CCTV. Nevertheless, there needs to be wide scale sensitivity as to how data is used, with AI technology giving a global picture, as opposed to focusing on individual vessels or fishing trips.

The fishing community also shared that there needs to be a change in the regulatory framework, because control tools will not provide solutions for the implementation of Article 15, nor will they increase fishers' willingness to adopt the LO.

The **managers and Member States** highlighted the challenges of AI and computer vision to extrapolate fish weight, which is not yet accurate. There are further technical challenges with regards to the vast array of relevant research projects across the world, each dealing with different fisheries and their unique circumstances. To facilitate cross-collaboration, methods and algorithms should be shared within the public domain.

The public "naming and shaming" at play in Iceland would be complex in the EU due to GDPR rules, thus, positive market incentives could be more appropriate; particularly in light of the fact that a significant portion of EU catches go through the EU market.

They shared that EU policies undergo harsh scrutiny prior to their implementation, and this process exposes more challenges. It was noted that not all problems can be solved by improving selectivity – more flexibility is needed within the regulations to ensure a broad suite of effective approaches.

The managers and Member States added that new technology opens the doors to new opportunities for automatic catch registration, data collection, marketing strategies, and control measures. There is a need to connect these systems with appropriate incentives. For example, automatic catch registration can inform quota management. Regardless of the

approach taken, close collaboration with the UK and between EU Member States is needed to ensure a level playing field. The challenges around maintaining monitoring devices at sea and the presence of additional crew members was also referenced.

10. Closing remarks

The workshop was closed by **Kenn Skau Fischer**, Chair of the NSAC Executive Committee.

The last reform of the CFP (initiated in 2013) kick-started current thought processes around discarding in fisheries and food security. Consequently, the LO was born. However, as evidenced by the workshop discussions, by reports authored by ICES and STECF, and by fishermen, it is difficult for fisheries to comply with the LO. There is a broad recognition that the LO is far from perfect.

Many of the stocks of interest to the NSAC are mixed demersal fisheries, where up to 30 different species can be caught in a single trip. This makes adherence to the LO particularly challenging for NSAC fisheries stakeholders.

Skau Fischer emphasised the importance of recognising "where we are today" and the progress that has been made in increasing understanding of the interactions between the LO and mixed fisheries. The exemptions offer flexibility, which makes the obligation workable. The presentations from Iceland and Norway provide a toolbox of new methods to consider. The NSAC will continue its work on the LO to produce a balanced, consensus-based advice piece concerning its implementation from a North Sea perspective.

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11. Workshop Proceedings – Day 2 (NSAC members)

11.1 Welcome and introduction

The Moderator, **Mogens Schou**, introduced the second day of the workshop, which was for NSAC members only. The aim was to identify key themes that would feature in an advice piece to the Commission, addressing the challenges of the LO and possible ways forward. He acknowledged that developing the advice would take time, and so the second day would be dedicated to identifying key, headline points. NSAC members were encouraged to frame their interventions in the context of the EU's political system, to ensure any recommendations are widely applicable and adoptable.

12. Summary of identified challenges, solutions, and formulation of recommendations

The Moderator invited views from the members on challenges and potential solutions.

Michael Andersen shared that the most important issue from his perspective is the adaptability of both the regulatory system and the fishing industry. He felt that the current management system is too inflexible: "the EU has imposed regulations on fishers that do not work and yet they demand that fishers adapt to them. If fishers must comply, the regulations need to be more flexible. Adaptability must go both ways."

He added that technological advances hold promise, but that the NSAC should warn against implementing new technology before it has been robustly tested.

With regards to increasing the selectivity of gears, he commented that individual fishers should be given free choice and the ability to adapt their gears according to the circumstances at sea, as opposed to being held to general rules. He believed that fishermen should have the accountability to choose and manage their own selectivity methods.

Linda Planthof acknowledged Andersen's suggestion. She added that full compliance with the LO should be rewarded with increased flexibility. However, greater flexibility should also be conditions-based. It is not feasible for policy-makers to generate rules for individual vessels, and so broad rules need to apply on a fleet-by-fleet basis. Measures are also needed to protect sensitive species.

Andersen agreed.

Alexandra Philippe highlighted that fisher gear choice should be supplemented with scientific evidence to demonstrate which gears are most selective.

Andersen observed that patterns and observations at sea can be truthful even without a scientific basis.

Planthof responded that scientific information is needed to ensure that gear adaptations do not increase the chances of catching Endangered, Threatened and Protected (ETP) species.

Andersen did not believe that fishermen would choose a gear with a high risk of catching ETP species. He highlighted that if a fisherman were to adapt his gear and this led to a worser catch composition, he would naturally revert back to his original gear, or find a better alternative.

Philippe indicated that flexibility can be a lope hole. The establishment and use of flexibilities must be for the benefit of the LO and to encourage compliance by fishers. There is scope for this to be facilitated by the Commission.

The Moderator summarised the conversation thus far. He stated that giving fishers both free choice of gear to adapt to the circumstances at sea and accountability is important to the fishing industry. However, flexibility should be conditions-based, with additional steps in place to protect ETP species. He then asked the group to consider the objectives that the technical measures serve.

Philippe indicated that the evaluation process within STECF is too lengthy, to which Andersen agreed.

Mike Park remarked that accountability is a key objective of the technical measures. He also felt that regulators must move away from setting technical measures on mesh size.

Emiel Brouckaert interjected by stating that fishermen have always wanted to avoid unrewarding work, such as catching fish that cannot be landed. Since the LO and Article 15 came into force in 2014, nearly ten years of discussion and scientific research have ensued

about ways to tackle the LO. He reiterated: “the fundamental aim of fishing gear is to catch fish and create revenue in a sustainable way. Why should we suddenly try and find a technical solution to something that has been worked on for 10 years?” He encouraged the members to look back at the work that has been achieved to date and consider what more can be done to build upon this.

The Moderator observed that developing general rules is challenging, thus making it important to stay true to original objectives. He reflected that the crux of the conversation hinged on accountability. If accountability can be achieved within the LO, it may be possible to move towards a situation where fishermen have greater choice.

Andersen commented that the fishing mortality data used within the ICES advice is inaccurate due to a change in the assessment method. Regarding the freedom of gear use, he said some members of the Commission believe that freedom is the way forward. He felt the NSAC had exhausted its influence in relation to the overarching act and voiced his support for freedom of rules and adaptations around gear, so that fishers can adapt their quota situation to reflect circumstances on the ground.

Planthof reflected that there was agreement within the room about increasing the flexibility of gears, provided that these flexibilities fall “within limits”. She added that accountability should also be a condition for this.

Tamara Talevska queried why the industry objects to the use of CCTV if their gears are “clean”.

Andersen confirmed that the main concern around CCTV is the breach of privacy. Therefore, it is easier to comply where there are provisions for greater freedom.

The Moderator asked the group to consider the potential benefits and problems of technological solutions.

Park highlighted that AI is coming whether the industry likes it or not. In his opinion, the greatest difficulty facing mixed fisheries is choke species, which is a greater issue than selectivity and technical measures.

Andersen and Brouckaert acknowledged the benefit of cameras, but emphasised that most fishers are wary of them. Brouckaert clarified that cameras are used for traffic control and to detect speeding offences, which generates negative connotations when regulators suggest installing cameras onboard vessels. Fisheries observers represent the alternative approach to cameras. Observers can be reasoned with, whereas, cameras leave no room for discussion or negotiation.

Planthof suggested that the NSAC’s advice could recommend increasing support for the LO among the industry.

Andersen shared that cameras could be adopted on a voluntary basis, with CCTV monitoring taking place on board vessels in exchange for more flexibility.

The Moderator reminded the members that in the REM trials 2009-2015 fishermen were offered benefits in exchange for their participation, which led to high levels of interest. He

identified the headline point of creating more freedom around gear choice at sea, in order to achieve more selective fishing practices and to create a situation that is more economically viable for fishermen. In order to achieve this situation, it is important to demonstrate catch accountability. He invited the members to consider this point and discuss it further outside of the workshop, before asking them to share further headline points to inform the advice.

Planthof suggested including FDF in the advice as a possible alternative to the LO.

Philippe said that FDF is inexorably linked to REM and CCTV. CCTV is thought of as a control issue rather than as part of the solution for data collection and documentation. She asked how it would be possible to guarantee that the flexibility incentive is more enticing than CCTV aversion.

The Moderator clarified that when the concept of FDF was introduced in 2008, it was put forward as an opening to establish a free choice in fishing methods thereby profiting from fishermen's ability to optimize catch patterns in support of economy and the main policy objective of aligning catches with TACs. Unfortunately, the Commission took the concept and framed it within the context of control.

The conversation moved to the setting of ICES advice.

Andersen articulated the problems created by choke species and the mixed species Maximum Sustainable Yield (MSY) approach. He said the Commission's policy is to focus on MSY at all costs. To settle on an average advice value every year is an oversimplification. He added that haddock is quickly becoming a choke species due to the application of MSY targets in demersal mixed fisheries. Overall, he wanted to see more flexibility in approaches to quota setting.

In response, Planthof queried how mixed fisheries should be managed. She added that developing a long-term perspective on management within the restraints of current legislation is of interest to NGO members.

Andersen voiced that MSY could be applied more wisely to better align with the situation at sea. He provided an overview of the scientific advice process and the key differences between the advice and the assessment. He called for adaptability in matching fishing opportunities with timely stock assessments. He suggested that quotas could be adjusted within the course of a single year, but noted that this would create challenges for fishers to plan ahead. He also suggested amending the quota year, or shifting the release of ICES advice to the autumn, after which the new quota year could commence from 1st January. He acknowledged that there would always be an element of assumption in the advice, and that mismatches arise from discrepancies in the assessment methodology.

The Moderator questioned whether the Member States typically supply data to ICES in a timely manner.

Andersen replied that this process could be faster. He understood the need for a set period of data collection but felt that ICES could move their assessment meetings forward by at least one month to speed up the process.

Planthof also reinforced that managers could shorten their deliberation time, as is the case for short-lived stocks.

The Moderator summarised that it will be important to move towards a timely and adaptable advice system to complement the LO.

Andersen asserted that scientific assessment is more important than scientific advice. It should not fall to scientists to make recommendations.

Talevska highlighted the value in real-time stock assessments for the creation of a more adaptive management system.

The Moderator suggested the headline of incentivising real-time, applied technological solutions for the documentation of catches.

Anais Mourtada indicated that the LO is poorly understood by fishermen because the exemptions change every year. She suggested applying the LO to broader groups of key species, leading to fewer exemptions that can be in place over longer periods of time; she suggested exemption reviews every three years.

Andersen acknowledged her comments and explained that they could be addressed in a separate discussion within the Skagerrak and Kattegat Working Group.

The Moderator suggested that an important headline to raise is the over-reliance of the LO on the exemptions.

13. Presentation of draft recommendations and reflections

The Moderator highlighted that the Technical Measures regulation includes a section on pilot projects that could help to improve the functioning of the LO; for example, a potential provision for the free choice of gear. Therefore, there are underused instruments in place that could be utilised to establish greater flexibility. These could help the LO to function in a way that permits fishermen to work with the system rather than against it.

Planthof warned that the pilot section of the Technical Measures regulation is complicated to put into practice, because there are many conditions that need to be met. It was used in the pulse fishery in the past and limited to only six vessels.

Andersen articulated that more flexibility is needed on an individual vessel scale, and so the pilot project approach is not suitable. He added that research by Clara Ulrich demonstrated the effectiveness of enhancing freedom of gear choice for improving selectivity. Thus, a differentiated approach to the LO could be a way forward.

Claus Hjørne Pedersen reiterated that the LO is overly dependent on the exemptions. He felt it is striving for something that is not possible.

Brouckaert observed that the exemptions could be used on a more ad-hoc basis.

Planthof relayed that the Commission intends to evaluate the CFP this year. This could be an opportunity to advise the Commission to evaluate the LO's intended effect in comparison to the actual effect on stocks. With regards to increasing flexibility, she asked how this would improve the implementation of the LO.

Andersen responded that in its present form, implementing the LO fully would create significant issues for fishermen. A differentiated approach to the LO would allow for greater flexibility, which should therefore help to increase compliance.

Planthof went on to highlight that most conclusions indicate that the LO is not being complied with at present.

Andersen relayed the crux of the issue: in its current form, the LO cannot be complied with. The LO legislation needs to be more pragmatic and reflect reality.

Talevska asked if an impact assessment was carried out when the LO was first proposed, in order to measure the effect of the LO on stocks in the future.

Planthof indicated that the Commission is measuring compliance, but not the impact on stocks and the environment.

Park commented that the LO is being applied "to the best of our ability". There is a recognition that the LO has created a situation akin to "square peg, round hole". When it was first proposed, the industry vocalised a range of unintended consequences to the EU Parliament, all of which have come true. He agreed that the LO was not a practical solution but highlighted that it is not going to go away. Therefore, practical solutions that fit within the framework of the LO are needed; for example, a greater understanding of spatial and temporal species distributions, real time reporting, and technological solutions in the future.

Talevska agreed that the LO is a transitional measure while camera, drone, and AI technology is under development. New technologies will pave the way for FDF in future.

Jacob Handrup emphasised that drones are not effective for monitoring demersal fisheries. They are only suitable for monitoring pelagic fisheries and for the surveillance of protected areas.

Mike Park reminded the members that when they first embarked on reviewing the LO, the NSAC and NWWAC developed indices of species that they predicted would become chokes within the following year. In reality, none of the species identified caused choke situations because fishermen chose to avoid them on the basis that choke species are detrimental for business.

The Moderator drew the discussions to a close.

14. Closing Remarks and Next steps

Andersen explained the next steps for the NSAC's work on the LO. Following the workshop, the LO Focus Group, with support from the Secretariat, would draft a recommendation addressed to the Commission, which will be submitted to the Demersal Working Group and

Executive Committee for adoption. He said the piece would outline the headlines discussed in a way that will be agreeable to both members of the fishing sector and the OIGs. He was pleased by the spirit of collaboration shown during the workshop.

He highlighted three ongoing actions. Firstly, the drafting of an NSAC response to the Scheveningen Group on the existing derogations, which he was personally preparing with the Secretariat. The piece would be circulated for review in due course. Secondly, Mike Park would continue to keep the NSAC informed of UK and Scottish fisheries management plans. Thirdly, Andersen offered to keep the NSAC apprised of updates from the Northern Fisheries Alliance.

He announced that Jacob Handrup would soon be taking over as Chair of the LO Focus Group.

He thanked the members for participating and closed the meeting at 12:00 CET.

15. Headline points and key themes

Headline points
1. **Selectivity:** Increasing selectivity is important for reducing fishing mortality through free choice of gear and adaptability of gear type, as opposed to general rules. Promoting the accountability of fishers may assist this. Use of REM and CCTV may be considered as a voluntary measure in exchange for more flexibility.
2. **FDF:** There is scope for CCTV to play an important part in achieving fully documented fisheries, however, it is often framed as a control mechanism rather than part of the solution for data collection and documentation in context of a free enterprise approach. Placing fishers as part of the solution (through data collection), rather than part of the problem (through control) could help to improve compliance.
3. **Mixed species MSY approach:** Applying the MSY approach to mixed fisheries can often lead to choke situations. Greater modality, a long-term approach to management, and inclusion of ecosystem considerations are needed within the legal system to help fishers to cope with choke situations.
4. **Stock versus assessment mismatches:** To prevent misalignment between ICES advice and fisher observations at sea, the advice and assessment processes need in-built adaptability to match fishing opportunities with timely stock assessments; preferably through real-time stock assessments.
5. **Existing flexibilities:** Opportunities exist to explore underused instruments within the LO that may permit greater flexibility, thus aiding fishermen to work with the system rather than against it.
6. **Differentiated approach:** More flexibility on an individual vessel scale could help to increase understanding and compliance by the industry.
7. **"Square peg, round hole":** In its present form, the LO cannot be complied with – it is only workable because of the exemptions. The implementation of the LO legislation therefore needs to be more pragmatic to reflect reality.
8. **Impact assessment:** There is a lack of baseline and up to date information about the impact of the LO on stocks and the environment. This raises questions as to how to assess its effectiveness in preventing unnecessary fishing mortality.

9. **LO as transitional measure:** While technologies and a free enterprise approach enable fishermen to match catches with available quotas the LO may be eased as economy will favour all catches landed.