Remote Electronic Monitoring: Securing Compliance with the Common Fisheries Policy

Verified and timely catch data is essential to securing the long-term sustainability of European fisheries. If used correctly, it can deliver stock assessments, monitor compliance, and determine the conservation risk of protected species. However, a significant proportion of fisheries dependent data continues to be sub-optimal[1] and vulnerable to widespread mis-recording;[2] informing management decisions which threaten the objectives of the Common Fisheries Policy (CFP). To address this, the revised Control Regulation should mandate the introduction of Remote Electronic Monitoring onboard all vessels over twelve metres, alongside an additional percentage of small-scale vessels that are at a high risk of breaching the rules of the CFP.

Remote Electronic Monitoring – What it is, and why it matters.

Remote Electronic Monitoring (REM) technology consists of an integrated array of equipment that monitors fishing activities on vessels at sea, such as sensors (e.g. net/gear sensors) and Closed-Circuit Television (CCTV) cameras. The resulting information enables both the cross-checking of logbook data and the confirmation of vessel compliance with regulations. This not only discourages violations because activities are monitored, but it also gives legitimacy to self-reported data, which has thus far had its potential limited by clear deficiencies.

Additionally, as the catch sector comes under increasing pressure to guarantee ethical production for its clients, it is clear that REM could not only benefit management, but also profitability. This is indicated by growing support within the retail and seafood processing sectors for the introduction of CCTV onboard fishing vessels. For instance, in 2019, five of the largest national food industry companies in Sweden came together to demand stronger monitoring measures onboard fishing vessels, including camera surveillance.[4] This action, alongside similar calls from German retailers,[5] and also export markets like the UK,[6] indicates that vessels installed with REM could add significant value to a catch that is verified as legally sourced.

In light of this, we wish to build upon EFCA's recent call to introduce REM[7] by supporting its compulsory introduction, including CCTV, onboard all EU fishing vessels over twelve metres in length, which should be phased in according to the risk of non-compliance with the rules of the CFP. Furthermore, this mandate should extend to vessels under twelve metres that display a 'high' or 'very high' risk of non-compliance.

EU Fisheries Control – The Issues.

1. Inaccurate Data

By collecting and sharing catch data, we can inform the delivery of stock assessments, catch quotas, and policy decisions that successfully encourage stock recovery and sustainable practices within the EU fleet. However, in order to ensure that management decisions effectively deliver on the rules and objectives of the CFP, steps must be taken to ensure that this data is both reliable and timely.

Yet, a significant proportion of fisheries dependent data is sub-optimal and vulnerable to widespread misrecording.[8] Findings in Denmark indicate that fishers unintentionally fail to report up to 29% of porpoise bycatch,[9] whilst there is also widespread acknowledgement that under-reporting can occur when fishers encounter low-quota (or 'choke') species.[10] Of course, a variety of information goes into stock assessment models, with fishery independent data (i.e. scientific surveys, tagging programmes etc.) playing an important role. However, the current control system, lacking an effective method of logbook verification, clearly fails to optimise all the data sources needed to guarantee effective and sustainable management.[11]

2. Weak Enforcement

From an enforcement perspective, the implementation of the Landing Obligation (LO); a measure designed to incentivise operators to avoid unwanted or undersized catch, is a clear example of how monitoring and compliance challenges have undermined the objectives of the CFP. In 2016, EFCA assessments of fishing activity in both the North and Baltic Seas indicated that a majority of vessels using active gears are at a medium to very high risk of non-compliance[12] – a finding corroborated by a number of reports highlighting the continued practice of discarding unwanted catch in the Baltic.[13] This snapshot of existing illegal and unreported fishing reflects an enormous ecosystem risk that necessitates effective monitoring and control at sea.

However, the LO is not the only measure that requires a robust control system. EU laws exist to prevent the bycatch of protected or sensitive species. The Technical Measures Regulation requires that the incidental catch of such species be "minimised and where possible eliminated",[14] while the Habitats Directive obliges Member

States to establish a system to monitor the incidental capture and killing of protected species (such as cetaceans) and, in the light of the information gathered, to take further research or conservation measures as required to ensure that incidental capture and killing does not have a significant negative impact on the species concerned.[15] However, Member States have failed to implement adequate conservation measures, or establish and enforce monitoring systems that triangulate the exact cause(s) of such bycatch.[16] Consequently, the conservation status of these species continues to be threatened, with approximately 85% of 11,300 common dolphin deaths during winter 2019 being the result of bycatch in the Bay of Biscay alone.[17] As enforcement here has been restricted by a combination of poor monitoring and inaccurate sampling,[18] REM can have a dual benefit in driving compliance on both a practical and policy level.

3. The Shortcomings of Traditional Monitoring Methods

The deployment of onboard fisheries observers has long been considered the most effective answer to the key issues surrounding data and compliance.[19] Indeed, at least in principle, observers remain an effective tool for verifying both catch and discard data. This is evidenced by pilots in Denmark[20], England[21] and Scotland,[22] where proximity to observer-collected data has been used to measure the accuracy of REM systems.

However, whilst pilots in the US[23] and Australia[24] have attempted to mandate 100% observer coverage, the fact that both efforts have been abandoned – with both now transitioning to REM (including CCTV) – is indicative of the fact that observer programmes lack the scalability needed to ensure that fisher behaviour delivers on the EU's overarching sustainability objectives. Often this is due to cost, with Danish studies finding REM systems to be – depending on a country's wage structure – at least 5.4 times cheaper to establish.[25] Furthermore, observer systems are also hampered by a short, and unevenly distributed workforce,[26] which makes data collection vulnerable to sampling biases that can distort competition by placing uneven cost-burdens on operators.[27] The result is a monitoring system that is only viable to cover 1-5% of fishing activity;[28] making it often less suitable than REM when addressing the current issues facing the EU's control system.

Remote Electronic Monitoring as the Solution

Improved Data Collection to Support Stock Assessments

Not only is REM scalable, but in many scenarios it also carries a number of substantive advantages over observer monitoring (e.g. the ability to monitor multiple operations at a time, as well as avoiding the need to take breaks, get sick, eat and sleep). To illustrate, one Danish study found REM (92%) to have a far superior bycatch detection rate when compared to fisher-led observation (63%),[29] which can be put down to a combination of camera positioning (i.e. capturing bycatch falling out of nets before it reaches the deck) and the fact that video-playback options allow observers to devote specific attention to multiple data fields.[30] The absence of the latter has been problematic for bycatch monitoring in the past, which has traditionally made up just one field under the Data Collection Framework – the split focus that this necessitates culminating in a downward bias when compared to dedicated monitoring.[31]

Furthermore, by including CCTV, REM also has the ability to build upon recorded data in a way unrivalled by its competitors. For example, by combining the high spatial and temporal resolution of GPS position data with time stamped activities captured by cameras, one can produce a record of fishing activity that adds precision to both logbook[32] and VMS[33] data. This can subsequently be used to enhance the mapping of bycatch and stock distribution.[34]

Improved Compliance

The fact that 80% of Danish fishery inspectors have expressed positive views on REM is also indicative of its importance from an enforcement perspective.[35] Already, numerous European pilot studies have documented its ability to accurately verify both retained and discarded catch,[36] which is crucial if regulators are to account for the LO's *de minimis* exemption[37] and discard allowance for species with high survival rates.[38] Moreover, REM is able to provide *verifiable* video-based proof of non-compliance, which can be used to successfully prosecute offenders beyond all reasonable doubt – something that existing means of control (e.g. aerial surveillance, at-sea inspections) have struggled to obtain.[39]

So, what's the delay?

Concerns over Technological Capacity

Several concerns exist in relation to REM's capacity for effective data collection. Here, reservations about weight-related information can be easily dismissed through the adoption of catch handling protocols (e.g. 'basketing'[40]), or length-weight relationships calculated by reference to digital calliper software[41] (in the same way that onboard observers "often estimate catch by applying an average piece weight to the piece count"[42]). Meanwhile, although difficulties have been encountered in relation to the performance of CCTV in high-volume, mixed-species fisheries – particularly when distinguishing between closely related species, or determining the length of a specimen that is obscured by debris and other fish[43] – recent REM pilots in Scotland[44] and the USA[45] have both recorded high correlations between catch data and fishers' logbooks in high-volume fisheries. The former, also successfully testing a 'morphometric length inference model' that can be used to identify total length by reference to other characteristics (e.g. pectoral orbital height).[46] When this is combined with AI developments in machine learning and computer vision technology,[47] which are already capable of streamlining data collection and rapidly analysing footage in near real-time, it is clear that CCTV is a solution now, but also one that offers continuous advancement for adaptive fisheries management in the future.

Concerns over Privacy

Fishers often view the installation of cameras onboard their vessels as an invasion of privacy; capable of divulging 'trade secrets' and recording information (e.g. bycatch footage) that could be sensationalised by third parties in an effort to discredit the industry.[48] However, there are numerous safeguards available to guarantee data privacy (e.g. encryption, rights of review, FOI exemptions, irreversible pixelation[49]), whilst it is also important to dispel the myth that CCTV will equate to full-time personal surveillance. Already, the sensor systems incorporated into REM can ensure that video-monitoring is only triggered during "active fishing operations",[50] whilst proposals surrounding an upcoming Swedish pilot study have already discussed how the capture of personal data can be minimised by "shielding, masking or pixelating personal data that gets into the picture".[51] Moreover, as automatic-recognition software improves, the need for human involvement in the video review process is likely to diminish, along with concerns over potential manipulation.

REM - How to make monitoring work for the EU fisheries control system.

The revision of the EU Control Regulation represents a critical opportunity to produce a fisheries management system that successfully promotes environmental sustainability, whilst furthering the economic viability of the fishing industry. After over 100 trials and 12 fully implemented programmes worldwide,[52] REM (including CCTV) has already demonstrated its unrivalled capacity to play a critical role in delivering such a system. When this is combined with the need for the EU to set the benchmark for future efforts to eliminate IUU fishing in third countries, it is clear that this is also an opportunity for the EU to instigate global change in fisheries governance for years to come.

We therefore propose the following amendments:

1. Article 13 - Remote Electronic Monitoring: mandate the introduction of remote electronic monitoring (including CCTV) onboard all vessels over twelve metres in length. Here, implementation should be phased in, starting with Union fishing vessels that are identified as being at a 'high' or 'very high' risk of non-compliance with the rules of the common fisheries policy. This should then progress to 'medium' risk vessels before finally expanding to all remaining vessels operating over the length threshold. To inform these decisions, the risk-assessment will be derived from those conducted by EFCA under specific control and inspection programmes, adopted pursuant to Article 95 of the Control Regulation. Furthermore, this mandate should extend to vessels under twelve metres that display a 'high' or 'very high' risk of non-compliance.
2. Article 25a - Extending the use of CCTV beyond the control of the landing obligation: extend the purpose of CCTV beyond enforcing the landing obligation, so as to give effect to the vital role that it can play in ensuring that management decisions effectively deliver on the rules and objectives of the CFP. In particular, through the verification of catch data and the collection of accurate information on the bycatch of sensitive species. Again, this should be accompanied by the practical measures that have been outlined above.

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