

Theme session N

Desirable and undesirable consequences of mixed fishery management. Effective strategies for reducing discards and choke effects while increasing overall quota utilization

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TAC management and additional output controls such as discard bans and bycatch reduction measures may facilitate mixed stock management, but may also constrain overall quota utilisation. How can we design effective strategies for reducing discards and choke effects without constraining overall utilization?

Objectives of the session

Quota utilization is influenced by many factors, including management strategy (e.g. input or output controls), market opportunities, the availability of resources (both temporally and spatially), regulations governing gear specifications and access to fishing grounds, and overly-optimistic or non-restrictive quotas. In mixed- or multi-species fisheries additional factors may come into play including species interactions, tactical and technical aspects of fishing practice, and aspects of quota management which may constrain quota utilization by individual participants, co-operatives, or entire fleets. Poor quota utilization has been observed in multispecies fisheries in Europe, North America, and elsewhere.

Fishing opportunities can be further constrained by management rules designed to reduce bycatch and discards. These include comprehensive discard bans such as those that have been in place in some countries for decades, and more recently in the European Union with a gradual phasing between 2015 and 2019. A “choking” effect may become apparent under such regulations, when low quotas of some (choke) species prevent the full utilization of more abundant stocks. Closure or relocation may become necessary, unless mechanisms that allow flexibility through quota sharing or trading are put in place. To adapt to these circumstances, fishers must now determine how best to minimize catches of low-value or unmarketable fish while maximizing the value of their overall catches.

This session included contributions which investigated quota utilization in multispecies fisheries, with a particular focus on the role of the unwanted component of the catch, whether it is rejected at sea (discards) or must be retained. Contributions also examined the incentives and disincentives giving rise to incomplete quota utilization, as well as investigating technical and strategic approaches for reducing discards and choke effects. Case studies and multi-disciplinary perspectives that address the challenge of markedly reducing discards and increasing quota utilization were also presented, some involving collaboration among stakeholders and scientists.

Session Overview

During this session, the issue of choke species was addressed at several scales, from the country or fleet level to the haul level.

At the broader scale, a striking contrast was observed between talks coming from the US and those coming from Europe. On the West Coast of the US, it was suggested that mandated rebuilding plans may overly constrain mixed-fisheries and cause major loss of yield (McQuaw and Hilborn, P:67). In Europe, the same situation translates into large discard volumes created by choke issues (Ulrich et al., P:291), which the EU landing obligation has not yet solved because of the economic impact it is expected to impose, even with quota adjustments (Hoff et al., P382). Bio economic simulation results were presented in the posters for specific mixed fisheries cases, the Bay of Biscay hake-sole-Nephrops fishery (Vigier et al., P:132) and the Celtic Sea (Halouani et al, P:385).

At the fine scale, several talks addressed the need for increased knowledge of catch composition at the haul level to better understand the fine-scale targeting patterns and thereby facilitate the development of real-time avoidance strategies. For example, Kraak et al. (P:29) postulated that the perception of choke species situations in mixed fisheries modelling may arise because aggregation of catch composition at the trip level may mask finer-scale (haul-level) effects and precludes recognition of possible avoidance strategies at the haul level. Vermard et al. (P:597) pursued this further by developing multivariate statistical analyses of haul catch composition to objectively classify species as target, valuable bycatch or non-valuable (“collateral”) bycatch across several gears and regions. Real-time catch reporting informing mapping tools may then provide detailed information on species distribution, which could support operational adaptations to avoid catching choke species (Calderwood & Reid, P:031; Lehuta & Vermard, P:528). Various ways were presented to achieve this by making use of a variety available data sources: Lehuta & Vermard merged logbook with VMS data to define thresholds of desirable/undesirable levels of catch composition for a species of interest and associated risks of exceeding such thresholds. Calderwood & Reid utilized mainly DCF at-sea observer data to produce hotspot maps which were then coupled to the Real-Time Incentives (RTI) fishing credit schemes for a pilot case in the Celtic Sea (Pedreschi et al; P:100). Real-time sharing of catch statistics among skippers was piloted in the West of Scotland to avoid choking catches of cod (Marshall et al., P:062). Causes of discarding / slipping and the fishers adaptation were also discussed for Portuguese purse seiners (Feijo et al., P:440).

Using a different approach, Vasilakopoulos et al. (P:461) evaluated several indicators that could monitor selectivity changes in a fishery, and selected the ratio of $F(\text{recruitment age})/F_{\text{bar}}$ as the most simple and robust one, easily applicable in the context of trials to reduce undersized discards. This is consistent with the observation that for most cod stocks, it is preferable to target older rather than younger fish (Magnusson et al., P:590).

Another set of talks demonstrated the potential applications and opportunities of electronic monitoring systems for (automatically) scanning catches to register species

and glean accurate catch records including length profiles (McGuire, P:573, Lee & Attwood, P:393), including species like skates and rays which are sometimes difficult to distinguish for a human observer (Batsleer et al., P:278). Runde et al., (P:108) addressed the need to reduce discard mortality when discarding is permitted – for the snapper/grouper complex in the SE US, 100% discard mortality is assumed, based on barotrauma. Use of descender devices in the recreational fisheries hold promise for reducing this mortality.

After the presentation, the discussion considered with the importance of these detailed haul-by-haul data, and difficulties accessing this data. Fully Documented Fisheries provide a lot of benefits in terms of both scientific knowledge and accountability of fisheries impact, but data ownership and sharing remains a central question in any such initiative to reduce discards and choke issues in mixed fisheries.

In conclusion, it is obvious that many challenges and hurdles remain in the management of mixed fisheries, but this session highlighted the progress being achieved in their understanding and modelling at various scales.