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MEDAC ADVICE ON DISAGGREGATED DATA FOR TAILORED MANAGEMENT

Context

Fisheries data are essential for understanding and managing marine resources effectively. Accurate and comprehensive data support the implementation of sustainable fishing practices by informing the development of management approaches that account for ecological health, economic viability, and social equity. Such data can be collected directly from fishing activities ('fisheries-dependent' data, such as catch, effort, landings, and bycatch data), or gathered through scientific methods such as research surveys, acoustic monitoring, and tagging studies ('fisheries-independent data').[1]

These datasets can be collected and compiled in either aggregated or disaggregated formats, covering different parameters such as inter- and intra-specific characteristics (age, sex, size), spatial dimensions, seasonal variations, fleet composition, métier, etc. While aggregated data are typically useful for broad assessments, such as evaluating regional trends, or for obtaining a sufficiently robust assessment result, disaggregated data can be used as a basis for designing more tailored management measures for specific stocks, fleets, or areas.

Importance and benefits of disaggregated data

Despite their value, disaggregated data are often unavailable due to limitations in collection methods or aggregation practices. Organisations such as the FAO have highlighted significant gaps in disaggregated data across regions, and emphasised the need for disaggregated data to evaluate socioeconomic aspects, rural livelihoods, and food security.[2] Detailed fleet-specific data are crucial for understanding the roles of different sectors, particularly for small-scale and large-scale fisheries. FAO has further stressed "*the need for a more disaggregated approach to classifying fisheries and aquaculture services […] that can better serve the need to properly identify and assess different fisheries and aquaculture services along their respective supply chains for analytical and policy purposes*". [3] It has encouraged States to enhance data collection with greater disaggregation, particularly for small-scale fisheries, to increase their visibility to decision makers.[4]

The value of disaggregated data lies in how they can be applied to improve management precision and better evaluate stock status. This granularity is crucial for avoiding the masking of population effects and changes, and for being able to identify correlations between fishing activities and ecological indicators.[5] Moreover, scientists increasingly recognise the potential of extensive, detailed datasets for improving monitoring, control, surveillance, management, and conservation in fisheries.[6] such as by combining data from research surveys with catch declarations, to identify Essential Fish Habitats.[7]

Combining fisheries data with other relevant datasets (such as ecological, oceanographic, socioeconomic, and commercial information) allows for comprehensive and diverse analyses that can enhance the management of fishing activities. For example, this kind of analysis provides a clearer understanding of the relationship between specific biological and economic factors. In this line, scientists also stress that "*processing and integrating these big data with other fisheries data*

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allows for exploring the relations between socio-economic and ecosystem assets in marine areas, which is fundamental in fishery monitoring."[8] Beyond fisheries management, disaggregated data are increasingly used for environmental protection, and for spatial planning in areas with higher interactions with human activities.[9,10,11]

Despite these advantages, disaggregated data and scientific advice are not always fully utilised in management decisions. In the Western Mediterranean, for instance, specific data and recommendations exist for stocks and areas but are often overlooked in favour of broader, less precise frameworks. For example, while scientific advice related to European hake (*Merluccius merluccius*) could refer to Geographical Subareas (GSAs) or clusters of GSAs more aligned with actual biological stock distributions, current advice is developed at the scale of larger Exploitation Management Units (EMUs). This, in turn, limits the precision – and therefore also the likely effectiveness – of management actions. Similarly, catch limits for blue-and-red shrimp by GSA are not consistently adopted, despite evidence that such tailored measures could better control fishing mortality and align with biological realities. This disconnection between more detailed scientific knowledge and coarser-scale management represents a barrier to more targeted and sustainable fisheries governance.

In the context of the Western Mediterranean, the Scientific, Technical, and Economic Committee for Fisheries (STECF), has highlighted the limitations of aggregated data, noting that using data that are disaggregated by target species and fishing techniques yields more meaningful insights for management. It underscored that aggregated fleet effort data could lead to misleading conclusions about fishing pressure on specific stocks. Specifically, it stated that, "*many Mediterranean fisheries use bottom trawl nets targeting different species assemblages over areas and seasons. The use of overall effort of the whole fleet can thus be misleading if used directly as an indicator of the fishing pressure exerted on any single stock or fish assemblage. A disaggregation of the fleets by targets makes effort quantification more useful for management purposes as it may explain better any observed change in the stock's status. As such, the separation of effort across different metiers within the overall effort by fleet shall be investigated*".[12] The scientific results obtained in the following EWGs, namely 18-13, 19-01, 19-14, 20-13, 21-01, 21- 13, 22-01, 22-11, 23-01, 23-11 and 24-01, dedicated to the evaluation of the implementation of the Western Mediterranean Sea Multi-Annual management Plan (hereafter, MAP) highlighted the need of an increasing level of detail. In fact, at the STECF EWG 24-12, *the group was requested to update the graphical representation of fishing effort time series evolution by MS, GSA, vessel length and gear with the latest data obtained from the FDI datacall (TOR 1). Together with the fishing effort time series the group was requested to update the F-E analysis by stock and gear using the outputs from STECF EWG 24-10 (TOR 2)*[13].

Conclusion and recommendations

MEDAC advocates for the integration of disaggregated data, to the full extent possible, into scientific advice and fisheries management across the Mediterranean. Disaggregated data allow for management decisions that are customised to the unique biological, ecological, and operational characteristics of specific GSAs, stocks, and fleets. While disaggregated data can be aggregated for broader analysis, the reverse is not always possible due to data collection shortcomings, limiting the usefulness of aggregated data for in-depth assessments.

A tailored management approach, informed by robust and detailed disaggregated datasets, can enhance precision in decision-making and the alignment of management with conservation, social and economic objectives. This finer-scale approach allows for the implementation of appropriate actions in the right area, at the right time, and for the right fishery. Integrating disaggregated data into scientific advice and decision-making is thus essential for taking informed decisions and achieving sustainable fisheries management throughout the Mediterranean.

To advance these objectives, MEDAC recommends the European Commission the following:

- **Enhance monitoring and data collection:** Implement better spatial and temporal monitoring of fishing activities, for instance through the accelerated roll-out of remote electronic monitoring and other technological tools, supported by the EMFAF, to ensure data are collected at a resolution that captures relevant variation (e.g. target species, fleets, métiers) and support disaggregated analysis.
- **Request specific scientific advice:** Task STECF to provide stock assessments based on biological stock distributions, using disaggregated data, to reflect regional differences as accurately as possible.
- **Adopt tailored management:** Base management decisions on disaggregated data, to facilitate a more tailored approach to ensuring the sustainable exploitation of fish stocks while accounting for potential socio-economic impacts across fleets.

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