

New method developed to assess bluefin tuna stock status

Researchers at the Spanish Institute of Oceanography (IEO), the Balearic Islands Coastal Prediction and Observation System (SOCIB) and the US National Oceanic and Atmospheric Administration (NOAA) have developed a new method to improve estimates of the bluefin tuna adult population status.

The method, which combines analysis of larval abundances with the variability of environmental conditions at spawning grounds, provides independent estimates of the data provided by commercial fishing fleets.

Current estimates of the bluefin tuna adult population, which fishery scientists call biomass of the breeding stock, are based on data from catches of commercial fleets, which may sometimes be incomplete or unrepresentative of the stock status. Therefore, one of the ways to improve scientific advice is the development of new methods that are totally independent from commercial fisheries.

Bluefin tuna are born from small eggs - barely 1 millimetre in diameter - from those that hatch, within 48 hours after laying them, larvae about 3 mm in length, which in about 20 days metamorphose into juveniles of little more than 1 cm. These larvae can be effectively captured in the framework of scientific surveys using plankton nets, particularly in areas such as the Balearic Sea, where adult bluefin tuna congregate to reproduce.

This fact has been used by researchers to develop this new method aimed at improving the estimates of reproducer population status of adult Atlantic bluefin tuna (*Thunnus thynnus*), which combines the analysis of larval abundances and environmental conditions in egg-laying grounds and that the magazine *Deep Sea Research Part II* has recently been published.

The International Commission for the Conservation of Atlantic Tuna (ICCAT) has decided to incorporate this larval index into the assessment process for the East Atlantic bluefin tuna stock, which is breeding in the Mediterranean.

This innovative approach provides a practical example of how to integrate the variability of environmental conditions - habitat - and ecological considerations in general, in fisheries advice. This has been possible thanks to extensive research program on the larval ecology of bluefin tuna initiated by the IEO in 2001, which the above mentioned institutions have approached since 2011 in a coordinated way and which has made it possible to characterize the species' egg-laying habitats, whose

latest results have also been published in Deep Sea Research and in Reviews in Fish Biology and Fisheries.

"This confirms the crucial role of multidisciplinary and collaborative approaches that have made it possible to integrate operational oceanography and ecology for progress in the sustainable management of marine resources," conclude the researchers involved in the study.

The studies have been developed within the framework of national and international projects BlueFin, CERES and ATAME.

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