
ICES CM 2010/R:10

Identifying the potential habitat of anchovy *Engraulis encrasicolus* during different life stages in the Mediterranean Sea

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Information integrated from different parts of the Mediterranean was used to model the spatial and temporal variability of the distribution grounds of anchovy at different life stages. Acoustic data recorded with a 38-kHz split-beam echosounder from the Aegean Sea (eastern Mediterranean), the Adriatic Sea and the Sicily Channel (central Mediterranean), the Spanish waters and the Gulf of Lions (western Mediterranean) were analysed along with satellite environmental and bathymetry data to model the spatial distribution of adult and juvenile anchovy during summer, autumn, and winter. Similarly, egg distribution data from summer surveys were used to model the potential spawning habitat of anchovy. Satellite data were used as proxies to infer spatial variations of environmental factors and assess possible ecological relationships. Generalized additive models (GAMs) were applied in a presence/absence approach. Model results were evaluated based on the estimation of receiver operating characteristic (ROC) plots. The environmental factors considered to affect anchovy during the different periods of year were identified and discussed. The selected model was subsequently used to identify those regions within the entire Mediterranean basin with higher probability of supporting suitable anchovy habitats. Potential habitat maps were produced for each year, period, and study area as well as for the entire Mediterranean basin indicating suitable areas for anchovy's presence. The temporal stability of these areas was examined. The usefulness of such habitat suitability maps concerning the different life stages of a species in environmental research and fishery management is discussed.

Keywords: anchovy, habitat suitability modelling, Mediterranean Sea, small pelagic, spawning habitat.

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