

Counting and sizing of bluefin tuna schools by automated analysis of sonar images and data extracted from fishing vessels

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Actually the standardized CPUE of the Bay of Biscay baitboat fleet is used as the only abundance index for the juvenile fraction of the entire eastern stock. In the Bay of Biscay, the fleet use Omni mode Long Range Sonars (LRS) to search for tuna, and the information provided by these sonars provide data about the number and size of tuna schools in the search area, independent of food availability and feeding behavior. The idea is to use these independent data to get de standardized detection per unit of effort index. The proposed methodology involves: analysis of sonar screenshots by automated image processing techniques, generation of expert-supervised classification databases for classification in order to label sonar images and extraction of OCR (Optical Character Recognition) parameters from sonar screen dumps. Once we have the data, we apply a school aggregation algorithm based on the labels and geographical positions of detections, to obtain the number and the mean area of bluefin tuna schools at our databases. Once we apply the proposed methodology on the data extracted from an experimental scientific acoustic survey at the Bay of Biscay, we compare the detections from the survey with the ones obtained by the aggregation algorithm. The survey was carried out by a baitboat fishing vessel which performed a systematic acoustic survey to detect bluefin tuna schools along the study area. The number of schools at the acoustic survey were obtained by sonar, echo sounder and scientific observers, fishing activity was also done for sampling and species recognition.

Keywords: sonar, fishing vessel data, automated analysis, school counting and sizing, bluefin tuna.

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