DEPTH AND MESH SIZE EFFECT ON DISCARDING PRACTICES IN TRAMMEL NET FISHERY

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Abstract

Trammel nets are one of the most commonly exploited gears of small scale fisheries used all along the Greek coasts and in Mediterranean. However, knowledge on the discards of this gear is scarce. Discards in trammel net fishery include species with no commercial value, or commercial species, which cannot be distributed in the market because of their small size, or because they come on board already destroyed by polychaetes or other marine organisms while the nets remain into the sea [1]. However, the extended use of the trammel nets by numerous vessels could account for a significant quantity of discards. The aim of this work was to study the discarding practice of trammel nets and the effects of the mesh size, depth and soaking time on the amount of the discards produced.

Material and Methods

Experimental fishing trials with trammel nets of different inner/outer mesh size combinations took place in the Ionian Sea (Greece), during June and July 2004. The mesh sizes used for the inner net were: 44, 56, 72 and 80 mm. The outer panels of the trammel nets had a stretched mesh size of 220, 280, 360 and 400 mm, respectively. All nets were made up of sheets of the four mesh sizes joined end to end to make up a fleet and arranged in random order. Total net length for each mesh size was 500 m. A total of 76 sets of nets were deployed at depths ranging from 10 to 130 m. Normal fishing practices were followed. The nets were set during sunrise and retrieved the following morning, with a soaking time of around 20 h. After hauling, the catch was removed and analyzed separately for each net.

The analysis of the discards was carried out using the logistic regression model. A binomial GLM was used to assess the effect of the soaking time, depth and mesh size on the discard probability, first for all the specimens of all the species caught (n=2144) and then for three of the most abundant species. The goodness of fit was tested using the Hosmer test [2] and the ROC (Receiver Operating Characteristic) curve was used to describe the accuracy of diagnostic test.

Results and Discussion

Out of the three covariates used in the logistic regression model for all the specimens of all the species caught, only the depth appeared significant (Tab.1). The le Cessie-van Houwelingen-Copas-Hosmer test [2] and the ROC (Receiver Operating Characteristic) curve was used to describe the accuracy of diagnostic test.

The regression model showed that the probability of the discard of specimens decreased by about 10% from 10 to 120 m depth (Fig.1A). Although the depth was significant for the logistic model, the area under the ROC curve was 0.52, so the discrimination capacity of the model was very low (Fig.1B). The same logistic regression model was used to assess the probability of discarding for Sciaena umbra, Merluccius merluccius and Pagellus erythrinus. For S. umbra the model showed that only the mesh size was significant: the discard probability using the 44 mm mesh size was greater than for the 72 and 80 mm. For M. merluccius and for P. erythrinus no covariates were significant.

References

