SIZE SELECTIVITY OF TRAMMEL NETS USED IN THE COMMON SOLE, *SOLEA SOLEA*, FISHERY IN THE THRACIAN SEA (NE MEDITERRANEAN).

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Abstract

The size selectivity of trammel nets used in the Thracian Sea (Greece) sole fishery was estimated using catch-at-length data from five mesh sizes (44, 56, 68, 84, 110 mm full mesh). Selectivity of nets and variation between vessels were calculated using standard selectivity software. The bi-modal curve provided the best fits. The modal length for largest retention was 3.5 times mesh size. The optimum mesh sizes were compared to commercial practice. No significant difference between the vessels' fishing efficiency was shown.

Keywords: Selectivity; Trammel net; Solea solea, Greece

Introduction

The common sole, *Solea solea (Linaeus, 1758)* is one of the most commercially important flatfish for the Greek fisheries. The main proportion of sole catches (>70%) is fished in the N. Aegean Sea, mostly by trammel nets (60%-95%) (National Statistical Service of Greece). Few studies are available on the selectivity parameters of passive gears in Greek waters [1, 2, 3] and none of them concerns the flatfish fishery.

Materials and Methods

Experimental trials were conducted, in April and July 2001 by three equally sized vessels at depths ranging from 16.5 to 25 m. Ninety nets with 5 mesh sizes in random order were used (inner panel: 44, 56, 68, 84, 110 mm full mesh; outer panel: 220, 280, 272, 336, 330 mm full mesh). All nets were made of 210/3 denier multifilament twine, had equal length and height. The float lines were 100 m long having 20 g/m buoyancy. The lead lines were about 2% longer and weighted 150-180 g/m. The hanging ratio was 0.50 on headline and 0.51 on lead line. The fleets were deployed simultaneously according to commercial practices. The average soak time was 12.5 h. The catches were sorted by species and mesh size, measured (total length, body girth, in mm) and weighed (total weight, g). The standard selectivity software "Gillnet" and "EC model" (Constat) was used for estimating selectivity of the nets and variation between vessels [4, 5].

Results and Discussion

During April, 376 individuals were caught. Soles were mainly gilled and wedged and secondary entangled or trapped by the outer panels. The mean total length of sole ranged from 236 to 317 mm and increased with the mesh size. The 68 mm mesh caught the highest proportion by number (27.9%) and the 84 mm mesh by weight (29.3%).The catch below the minimum landing size (MLS=200 mm) was 4.8% and 0% for the 68 and 84 mm mesh sizes, respectively.

In July, 210 individuals were fished. The mean length ranged from 203 to 282 mm, increasing with the mesh size. The 56 mm mesh caught the highest proportion of the total catch (33.3% by number, 28.4% by weight). However, individuals of lengths <MLS composed 34.3% of the catches by number and 21.7% by weight. In contrast for the 68 mm mesh, which accounted for 27.1% of the total catch by number and 27.6% by weight, the proportion of individuals of lengths < MLS was considerably lower (5.3% by number and 2.9% by weight).

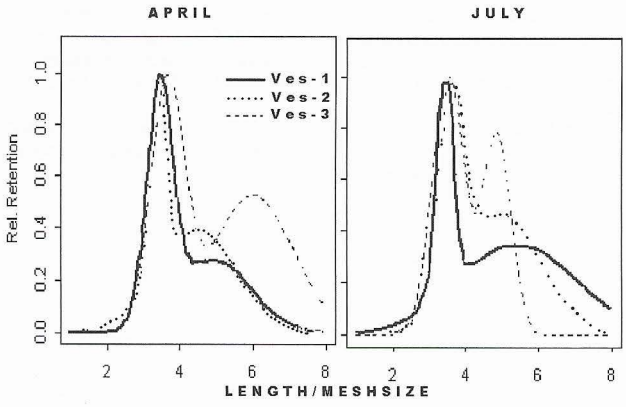

Fig. 1. Mean selectivity curves per vessel for both trials.

Selectivity was estimated using the bootstrap technique based on pooling catch data across all sets. Different functional forms were assessed and selectivity for sole was adequately described by a bi-normal selection curve [4, 5]. The location and the spread of the primary mode had good correspondence between the vessels and the two seasonal trials while the location and the spread of the second mode were more variable (Fig. 1, Table 1).

For the length range of sole that was fished, the most efficient mesh sizes were 68 and 84 mm. They had the largest catches and the amount of catch below MLS was ≤ 5%. The aforementioned mesh sizes are the ones most commonly used in the commercial fishery. The fish length for larger retention is 3.5 times the mesh size. There appeared to be no effect of vessel-factors in nets' selectivity for same type vessels. Also the seasonal difference of trials did not seem to affect selectivity.

Table 1. Bootstrap mean parameter estimates per vessel for both trials (α_1, α_2 = the location of the primary and secondary mode respectively, β_1, β_2= the spread of the primary and secondary mode respectively, ω= is a constant scaling the height of the second curve relative to the first).

	Parameter Estimates				
April	α_1	β_1	α_2	β_2	ω
Vessel 1	3.46	0.350	4.93	0.103	0.310
Vessel 2	3.38	0.217	4.47	1.071	0.512
Vessel 3	3.66	0.464	6.01	1.086	0.553
July	α_1	β_1	α_2	β_2	ω
Vessel 1	3.45	0.233	5.42	1.685	0.417
Vessel 2	3.61	0.354	4.98	1.103	0.584
Vessel 3	3.53	0.442	4.86	0.384	0.774

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