

## CATCH COMPOSITION OF SET NETS USED BY THE SMALL-SCALE FISHERY OF LIVORNO (EASTERN LIGURIAN SEA)

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### Abstract

Catch composition of three types of set nets used by the small-scale fishery of Livorno (eastern Ligurian Sea) was studied by observations on board of commercial vessels, from January 1999 to December 2000. Standard trammel nets, small mesh size trammel nets and gillnets were studied. Target species and retained by-catch represented the majority of the biomass caught with the two types of trammel nets all year round. Discarding was noticeable for gillnet only in summer and autumn.

**Key-words:** artisanal fishery, set nets, catch composition, coastal management, Ligurian Sea

### Introduction

The small-scale fishery is an important sector of the Livorno port; this activity is carried out with different types of set nets, used in seasonal succession according to the main target species and the availability of resources (1, 2). This paper describes the catch composition of these gears, paying particular attention to discards, an important information for an ecological-based management (3). This work was performed within a project funded by the Italian Ministero delle Politiche Agricole e Forestali (2).

### Material and methods

From January 1999 to December 2000, 49 observations onboard of commercial vessels of the artisanal port of Livorno were carried out, considering three types of set nets: standard trammel nets (60-70 mm stretched mesh size of inner panel), trammel nets of smaller mesh sizes (40-45 mm, stretched), locally called "tramaglino", and gillnets (80-85 mm, stretched). The composition of the catch, discards included, was studied without interference in the usual fishing procedures of the crew, especially concerning the sorting operations. For each haul the catch was divided in: target species, retained by-catch, discard of commercial and non-commercial species (3). Discard was determined to the lowest taxonomic level; total weight was recorded for each species caught. Catch per unit of effort (cpue) was estimated, standardizing the collected data as kg/5000 m of net per hour of hauling.

### Results and discussion

A total of 95 species were caught with trammel nets (59 fishes, 13 molluscs, 19 crustaceans and 4 echinoderms), 111 with "tramaglino" (69 fishes, 10 molluscs, 21 crustaceans, 1 cnidarian and 10 echinoderms) and 68 with gillnets (45 fishes, 11 molluscs, 10 crustaceans and 2 echinoderms).

In terms of weight, the majority of the total catch was composed of commercial species (target species + retained by catch), especially for trammel nets (69 to 84%) and "tramaglino" (91 to 94%), while this percentage was lower for gillnets (51 to 92%). For the latter, noticeable amounts of discards were recorded in summer and autumn (5.0 and 3.1 kg/5000m/h, representing 49 and 34% of the total catch, respectively) (Fig. 1).



**Fig. 1.** Seasonal catches per unit of effort (mean cpue + standard error) of set nets used by the artisanal port of Livorno. T = Target species; R = Retained by catch; CD = Discard of commercial species; NCD = Discard of non-commercial species.

Table 1 shows the main species per catch category and gear studied. The target species of trammel nets (*Sepia officinalis*, *Solea vulgaris* and *Lithognathus mormyrus*) accounted for 19-42% of the total catch, those of "tramaglino" (*Mullus barbatus*, *Mullus surmuletus* and *S. officinalis*) from 35 to 45% and that of gillnets (*S. vulgaris*) from 22 to 37%. Retained by-catch also had an important contribution, with generally higher cpues than those for the target species (from 2.1 to 5.2 kg/5000m/h compared to 1.5-4.0 kg/5000m/h of the target species, Fig. 1). Important species of this fraction, both in terms of weight and commercial value, were *Raja asterias*, *Ubrina cirrosa*, *Pagellus erythrinus*, *Octopus vulgaris* and *Squilla mantis*.

**Table 1.** The most important species in biomass of the different fractions of the catch, by gear.

	TRAMMEL NET	SMALL MESH SIZE TRAMMEL NET	GILLNET
TARGET SPECIES	<i>J. macrocephalus</i> <i>S. vulgaris</i> <i>S. officinalis</i>	<i>M. surmuletus</i> <i>M. barbatus</i> <i>S. officinalis</i>	<i>S. vulgaris</i>
RETAINED BY CATCH	<i>R. asterias</i> <i>S. mantis</i> <i>U. cirrosa</i>	<i>O. vulgaris</i> <i>P. erythrinus</i> <i>P. erythrinus</i>	<i>R. asterias</i> <i>T. accipitr</i> <i>S. mantis</i>
DISCARD OF COMMERCIAL SPECIES	<i>Solea vulgaris</i> <i>A. mediterraneus</i> <i>H. truncatus</i>	<i>D. auriscor</i> <i>M. barbatus</i> <i>M. surmuletus</i>	<i>S. vulgaris</i> <i>M. cephalus</i> <i>H. astanas</i>
DISCARD OF NON COMMERCIAL SPECIES	<i>Pagurus salinus</i> <i>P. excavatus</i> <i>Littoridinus varialis</i>	<i>D. auriscor</i> <i>M. glaucifrons</i> <i>H. tubulosa</i>	<i>D. auriscor</i> <i>A. psyllioides</i> <i>M. imata</i>

Discards, in terms of weight, were mostly composed of commercial species (77 to 97% of total discards) and dominated by fishes, often represented by damaged and unmarketable specimens. Non-commercial species discarded were mostly represented by small-sized species, reflecting the composition of the epibenthic communities inhabiting the exploited fishing grounds.

### References

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