

FISH POPULATIONS EXPOSED TO COASTAL BOTTOM TRAWLING
ALONG THE MIDDLE TYRRHENIAN SEA

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RESUME - *En étudiant la distribution bathimétrique de 79 espèces de poissons intéressés par le chalutage côtière on a mis en évidence les dégâts provoqués par cette activité agissant sur une profondeur jusqu'à 50 mètres. Au niveau de la zone entre la ligne de la côte et à peu près au 12 mètres de profondeur on a vérifié une importante concentration de formes immatures pendant les différentes périodes de l'année selon les espèces. L'étude a été conduit dans la Mer Tyrrhénienne central.*

The problem of bottom trawling along the Italian coasts has, for long time, been the topic of discussion among scientists, fishermen and politicians (Brunelli 1929; Frogliia & Orel 1979; Ardizzone 1981). Italian law prohibits trawling operations within 3 miles off the coast or in water depths of less than 50 meters. In spite of this law, nearshore trawling operations have increased in these last few years due to the growing fuel and operating costs and the decrease of off-shore stocks.

The consequences of nearshore trawling on the coastal resources vary in different areas. According to Frogliia (1979) the actual damage to Northern Adriatic stocks is so limited that nearshore trawling has been authorized during certain periods of the year.

With regard to the Tyrrhenian Sea, the question is more complex because of its greater environmental heterogeneity but the principal arguments against this kind of activity are:

- 1) damage to the Posidonia beds (Ardizzone & Migliuolo 1981)
- 2) damage to the nursery grounds of important species (Ardizzone 1981)
- 3) conflicts between the small-scale fishermen and the trawlers (Ardizzone 1981).

In order to better evaluate the environmental impact of trawling in the Middle Tyrrhenian, has been studied an area in which nearshore trawling is heavily practiced.

Both trawlers and small-scale fishermen work the area and large expanses of Posidonia beds heavily damaged are present.

Data are presented for 200 hours of bottom trawling carried out during 1980, 1981 and 1982 on bottoms varying in depth from 5 to 50 meters. The trawling net used was the Italian type with a mesh size of 16 mm.

In this work the bathimetric distribution of the fish species has

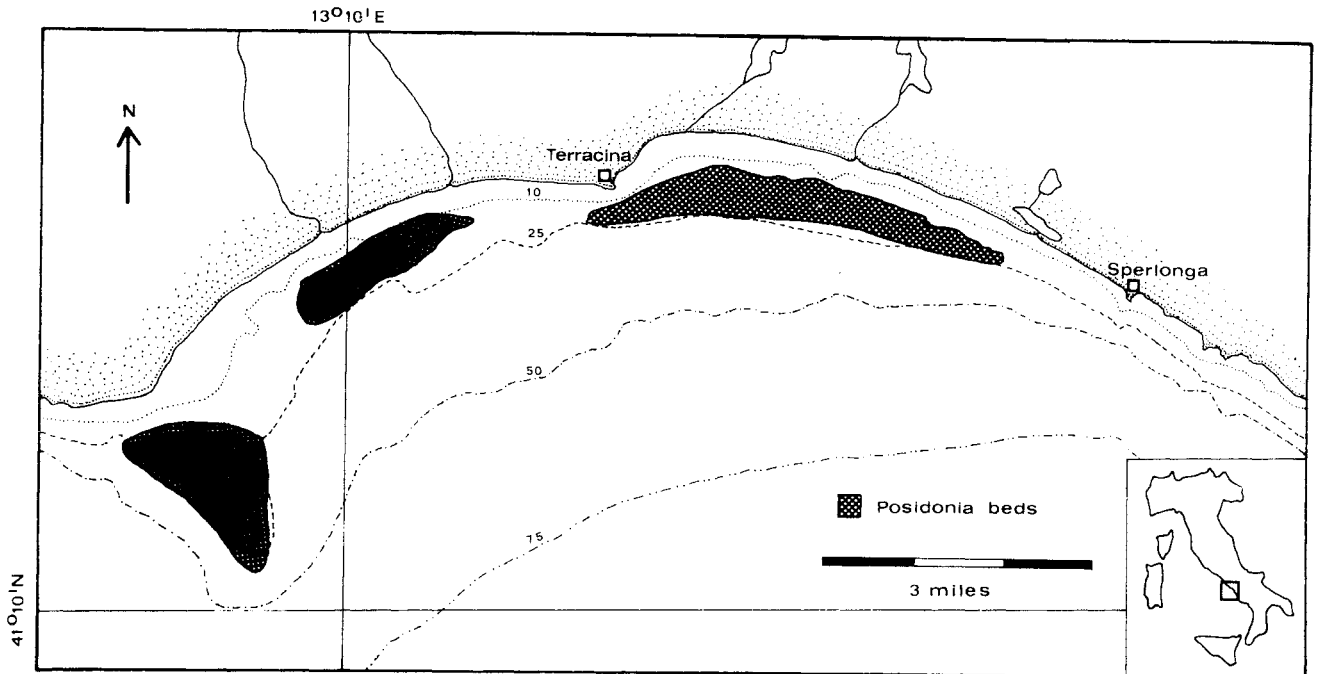


Fig.1: Coastal trawling sampling area

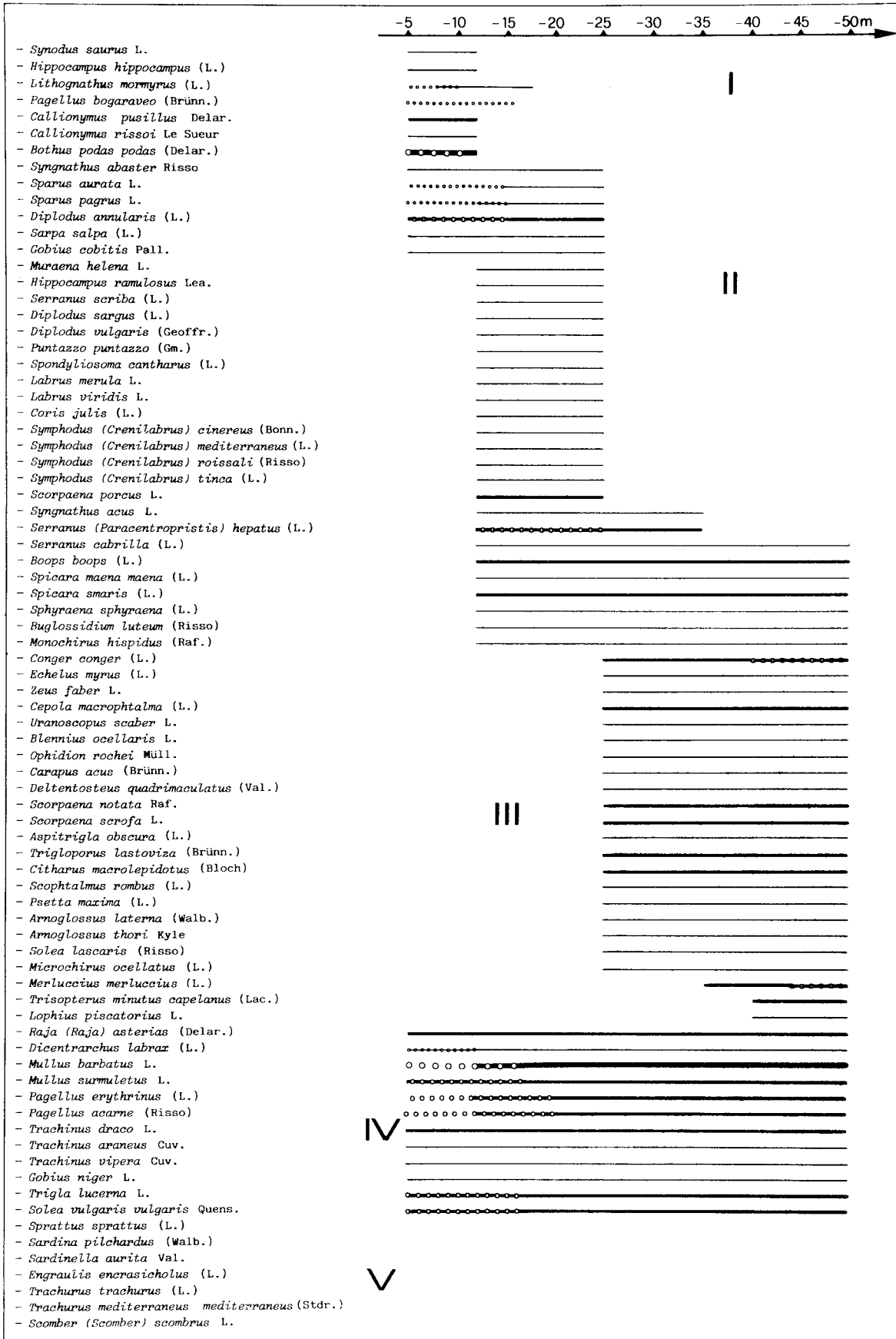
been studied. Juveniles (those individuals which have not reached the age of first reproduction) are considered in the study when they appear in significant numbers.

A total of 79 species of fish have been identified by the survey, but few of them are of any economic value. Particularly important are: *Mullus barbatus* L., *Pagellus erythrinus* (L.) and *Merluccius merluccius* (L.).

A schematic frequency distribution of the fish species by bottom depth is reported in Tab.1, where the varying thickness of the bars refers to the adult species abundance, while the circles refer to the juveniles abundance. As can be seen three characteristic groups appear as the bottom depth increase. A fourth is a wide-spread group and a fifth is a group of pelagic species.

The first group of species is composed of nearshore sand dwellers present up to a depth of 12 meters. *Bothus podas* (Delar.) is the most frequent species of this group. Periodically appearing at this depth are juveniles of many economically important species such as: *Dicentrarchus labrax* (L.), *Mullus barbatus* L., *M. surmuletus* (L.), *Sparus aurata* L., *S. pagrus* L., *Lithognathus mormyrus* (L.), *Pagellus erythrinus* (L.), *P. acarne* (Risso), *P. bogaraveo* (Brünn), *Trigla lucerna* L., *Solea vulgaris vulgaris* (Quens.) .

The second group is composed of species which extend out from a depth of 12 to 25 meters and live mainly on the Posidonia beds. None of the species belonging to this group is very abundant due to the regression of the Posidonia beds and the constant trawling pressure.



Tab.1

Quantitatively, the most important species fished is *Octopus vulgaris* (Cuv.) (up to 12,500 grams/hour), abundant because of its short life cycle and the reduced predation by other species.

The third group of species is made up by those which dwell on a muddy-detritic bottom. This group is found in bottom depths between 25 and 50 meters. This zone includes numerous species of economic interest and is the zone in which most of the species from the fourth group (the wide-spread species) are caught. The juvenile stages most affected by trawling in this zone, are those of *Conger conger* (L.) and *Merluccius merluccius* (L.).

The fourth group is composed of those species which can be found throughout the whole area. Some economically very important species belong to this group such as: *Mullus barbatus* L. and *Pagellus erythrinus* (L.). The juvenile stages of these species, present in the coastal waters at different times of the year, undergo heavy exploitation from the trawling operations. The *Mullus barbatus* L. stocks are especially harmed during September and October trawling when a large number of individuals between 8 to 12 cm total length (0+ age class) are captured.

The fifth group is composed of pelagic species which are only occasionally captured by bottom trawls, therefore of this group is not given a bathymetric distribution.

In conclusion these observations demonstrate that the most delicate bathymetric zones, with regard to trawling damage, are those including the nurseries and the bottom area out to a depth of 12 meters. In the next zone, out from 12 m to a depth of 25 meters, the major damage by trawling is to the *Posidonia* beds, whose condition influences the abundance of the related fish species. We can therefore fully justify the current trawling regulations and suggest further action to be taken in order to limit the increasing of this activity in the Middle Tyrrhenian Sea.

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