

# Status of Slovene research and fishery on small pelagics

Bojan Marčeta\*

## Abstract

An overview of Slovene small pelagic fishery research is discussed and an historical overview of fishery with remarks on fishing gear used and catch quantities obtained is given. *S. pilchardus* represents on average 93% of the total Slovene marine catch in the period from 1991 to 1999 and nearly 97% of the small pelagic catch.

## 1. Introduction

Although Slovene marine fishery has a long tradition, our modern fishery is not a simple continuation of this. The ancient fishery tradition developed on the coast between Trieste and the Timavo river (Slovene ethnical territory in the Republic of Italy) and lasted from 8th to 20th century, then after the second world war, gradually declined (Volpi Lisjak, 1999). Almost contemporarily our modern marine fishery started to develop on the basis of the Italian fishery tradition, already present on the modern-day Slovene coast in the Gulf of Trieste, and on the influence of Croatian fishery. As a result of the highly developed canning industry in Izola, small pelagic species were and still are the most important target for Slovene marine fishers.

The importance of small pelagics, mainly *Sardina pilchardus*, as raw material for the Slovene fishery industry results in research on and introduction of new fishing gears as well in biological and oceanographic research. The latter was restricted to the late sixties and seventies when basic research was carried out in Yugoslav territorial waters and international waters of the North Adriatic. Research and introduction of new fishing gear results in a more constant and ample supply for the industry.

The intention of the present paper is to give a review of Slovene research on small pelagics and to give an historical overview of fisheries with remarks on fishing gear used and catch quantities obtained.

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\* National Institute of Biology - Vecna Pot 111, SI-1001 Ljubljana, Slovenia; e-mail: bojan.marceta@uni-lj.si

## 2. Research

Slovene research on small pelagics in the North Adriatic began in the sixties at the Institute for Sea Research of Portorož (now the Marine Biological Station of the National Institute of Biology). The institute launched a seven-year project to prepare an atlas of migration of pelagic fish in the North Adriatic Sea (Štirn, 1966). The project comprised four main points: oceanographic conditions and distribution of organic matter, statistics, spawning grounds of pelagic fish, and topography of migrations. Štirn (1968, 1969) provided the basic knowledge on temperature, salinity, structure and circulation of the water body, density, nutrient salts, total organic matter, plankton, and ichthyoplankton for the North Adriatic Sea.

On this basis, investigations on biology, resources and migration of pelagic fishes began in early seventies (Štirn *et al.*, 1973, Štirn and Kubik, 1974, Kubik and Štirn, 1975, Kubik, 1976<sub>a</sub>, 1976<sub>b</sub>). After that time all research on small pelagics ceased.

At present in Slovenia there is no direct research on small pelagics although *S. pilchardus* presents more than 90% of the Slovene marine catch.

## 3. Fishery

For the purpose of industrial fishery surrounding nets were the only fishing gear until 1978 when mid-water trawl was introduced. From this year onward the mid-water trawls gradually substituted surrounding nets which were in use until 1991.

The abandoning of surrounding nets and reduction of fishing grounds (now in territorial waters of the Republic of Croatia) after independence in 1991 resulted in a drastic reduction of the fishing fleet. Volpi Lisjak (1999) listed 23 industrial fishing vessels equipped with surrounding nets, bottom, and mid-water trawls in 1990. Today only two pairs of vessels equipped with mid-water trawls are still in use for industrial fishing purposes.

The yearly quantities of small pelagics landings was always very near the total marine catch. The significant catch increase in the eighties was a result of new fishing technology – the use of mid-water trawls. In 1983 the total catch reached its maximum with 8,076 t. Another turning point was in nineties when a drastic fall in catch quantities was observed. The most important reason was not only the loss of fishing grounds in Croatia but also the loss of market in former Yugoslavia (Figure 1).

In recent years the catch of small pelagics has stabilized at slightly under 2,000 t (Figure 1; Table 1).

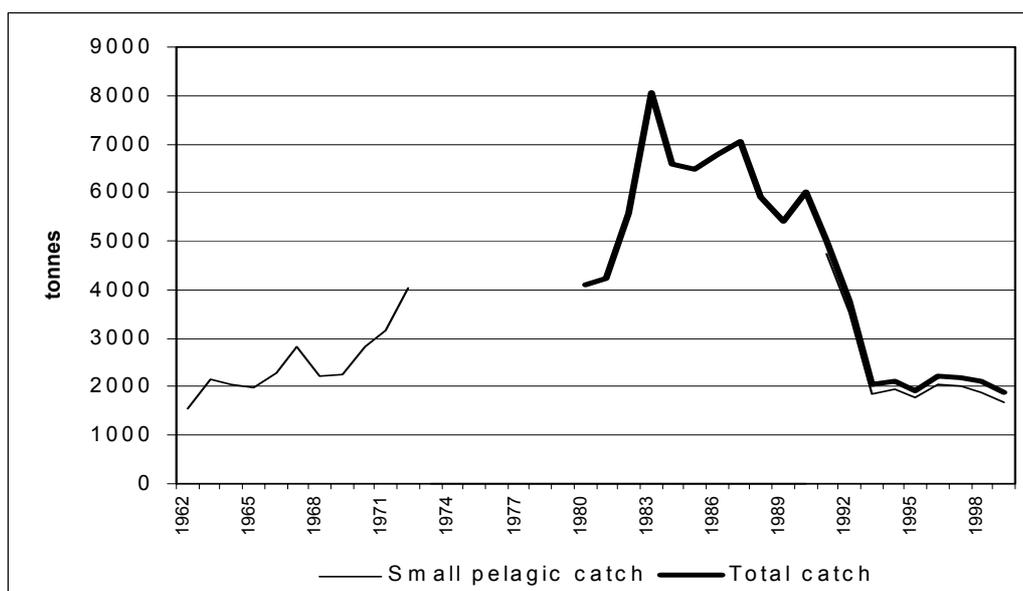


Figure 1. Catch of small pelagics and total marine catch in the period from 1962 to 1999. Source: Štirn *et al.*, 1973 (1962-1972); Statistical office of the Republic of Slovenia (1980-1999).

The analysis of data collected by Statistical Office of the Republic of Slovenia shows that in period from 1991 to 1999 *S. pilchardus* represents on average 93% of the total Slovene marine catch (Table 1) and nearly 97% of the small pelagics catch. *S. pilchardus* is a target species while other small pelagics, like *Engraulis encrasicolus*, *Sprattus sprattus*, *Trachurus sp.*, *Scomber scombrus* and *S. japonicus* can be considered as bycatch in mid-water trawls fishery. From statistical data for "bycatch" species it is evident that the abundance of some species is in decline while abundance of others is growing (Figure 2).

Table 1. Total Slovene marine catch from 1989 to 1999 and catch of *Sardina pilchardus* from 1991 to 1999 in tonnes and in percentage of the total catch. (Source: calculations from the data collected by Statistical office of the Republic of Slovenia)

Year	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Total catch	5.189	5.947	4.944	3.618	1.992	2.007	1.849	2.078	2.065	1.959	1.785
<i>Sardina pilchardus</i>	?	?	4.617	3.432	1.749	1.907	1.719	1.982	1.973	1.784	1.602
percentage of total catch			93,4%	94,9%	87,8%	95,0%	93,0%	95,4%	95,5%	91,1%	89,8%

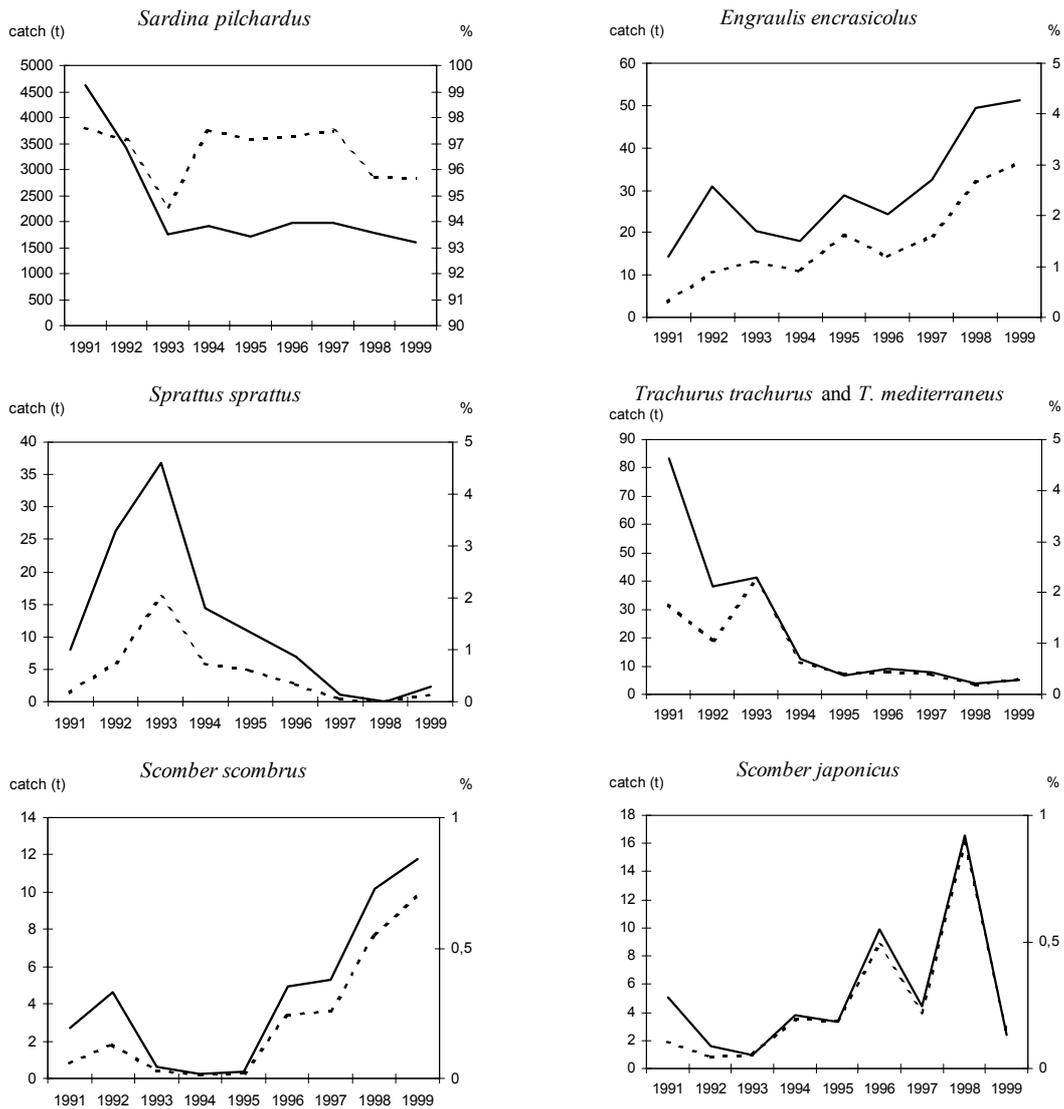


Figure 2. Total catch (solid line) of small pelagics fish species and species percentage (dashed line) in period 1991 to 1999 (source: Statistical office of the Republic of Slovenia). Note: abscissa axes are different.

Because of seasonal movements of *S. pilchardus* its capture in the Gulf of Trieste is possible only in the warmer period of the year when the sardine is present in sufficient quantities. In 1999 44% of the industrial catch was performed in Slovene territorial waters from April to December, while 56% was performed throughout the year in international waters of the North Adriatic (Figure 3).

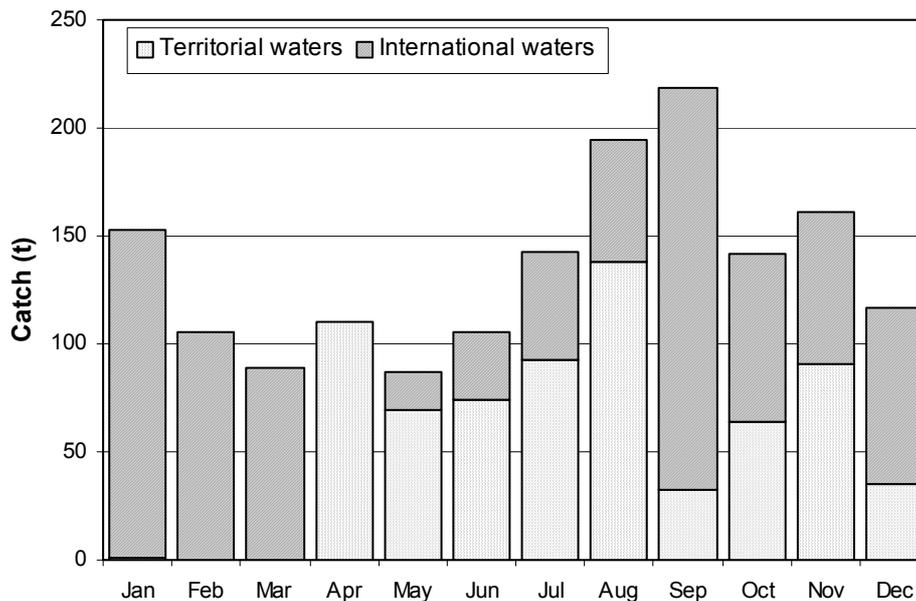


Figure 3. Comparison between quantities of Slovene industrial catch (mainly *S. pilchardus*) realised in territorial water of the Republic of Slovenia and in international waters of the North Adriatic in 1999. (source: Statistical Office of the Republic of Slovenia).

#### 4. Conclusions

The sardine was and is still the most important fish species for Slovene marine fisheries and related industries. Its importance is negligible for the state economy but quite relevant for local economy and tradition. This situation is reflected in the small amount of research performed in the past and the lack of fishery research in the present time. On the other hand research on small pelagics, which are migratory and widely distributed throughout Adriatic, requires international cooperation. Therefore all research activities on small pelagics within the context of the Adriamed project would be appreciated.

#### 5. References

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