

THE BLUEFIN SEINE FISHERY IN THE ADRIATIC

by

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1. HISTORY OF THE FISHERY

The bluefin fishery in the Adriatic has an old history. It has been in existence for several centuries, using various gears: fixed nets, similar to a small trap, nets maneuvered by boats.

The bluefin seine fishery has existed since 1929 in the Yugoslavian Adriatic (Morovic, 1969) and since 1932 in the North Italian Adriatic when two vessels, the "Thynnus" and the "Toneador", built and equipped for fishing bluefin, began to operate. Following a "break" after World War II, the bluefin seine fishery resumed in 1960 on the Italian side and is still operating.

2. FISHING SEASONS AND AREAS

At the present time, the bluefin seine fishery is carried out by a variable number of boats which are usually equipped for trawling (pelagic and demersal). When bluefin are to be found in the fishing area and trawling is not financially profitable, these vessels quickly switch to bluefin.

Fishing areas include the entire North Adriatic during April and November. However, south of Pescara, bluefin tuna are present all year round and sporadic catches are made, even in winter. The base ports are now Porto Garibaldi, Cosenatico & Pescara. Landings can be made at all ports along the Adriatic coast since the fish are landed at the port closest to the catch area.

Before 1940, the fishery operated above all along the coasts of Istria and in the Gulf of Trieste. From 1950 on, the major ports were Trieste, Monfalcone and Cosenatico. It is from this period that the fishery developed along the Italian coasts.

3. DESCRIPTION OF FISHING EQUIPMENT

Bluefin seine fishing equipment and techniques vary according to season and area.

One of the first vessels equipped for this fishery ("Toneador", 1932) was 26 m long, 5.30 m wide, 100 gross tons and a 180 HP motor which attained speed of almost 12 knots. The vessel had two fish wells of 66 m³ and refrigeration equipment; there was a 12-man crew. At the time, the press (September 2, 1932 "Corriere Istriano") noted that the vessel was aided in spotting fish schools by a hydroplane.

During this time, in the Adriatic, five Yugoslavian boats were equipped to fish tuna with seine nets. Various vessels, 15 m long and 4 m wide, used a seine of 120 m long and 50 m in depth.

Original report in French.

The twine of the net was 3 mm in diameter and the mesh was 50 mm. A series of leads (one each meter) was attached to the net, with a total weight of 1,400 kg.

In 1951, Scaccini describes the net used during that period: 600-650 m long, 50 m in depth, with 350 kg weights. The mesh was often 50 mm.

Since 1950, vessels began searching in pairs; half the net was on one vessel and the remaining half on the other.

Nowadays, vessels fish in pairs or singly. The size of the vessels is very variable. However, the majority have a 50 GRT, except for several very large boats that operate in the Tyrrhenian Sea and that occasionally fish during August in the South Adriatic. These vessels which are more than 30 m long use nets of 1400-2000 m long, with a depth of 150 to 200 m. It is, therefore, difficult for them to fish in the depths off the North and Central Adriatic.

In 1978, 21 Italian vessels operating in the Adriatic fished at least one day. The large Tyrrhenian vessels did not fish in the Adriatic this year.

4. RELATIONSHIP WITH OTHER FISHERIES

One of the characteristics of all Adriatic vessels is to adopt this type of fishery very irregularly. Many trawlers have nets for fishing tuna, usually stored since these vessels regularly fish by pelagic or demersal trawl. When it is financially profitable to fish tuna (trawl fishing is difficult and tuna are present in the area) the vessels quickly change nets (in a few hours) and begin fishing for tuna. They then change back to trawl just as quickly when tuna fishing is not profitable. Since profit conditions vary from one area to another and from one vessel to another due to various factors, in addition to commercial factors, fishing effort is very variable and difficult to follow.

The inter-relationship and dependency of other fisheries is due to the large variation in bluefin catches. The boats and crews cannot live the entire year by catching bluefin tuna alone.

5. FISHING OPERATION

Fishing is carried out in a slightly different manner if the vessels fish singly or in pairs. Now, fishing in pairs is more common. The two boats, each with half the net, search together, attached to each other by the net itself. When a tuna school is sighted near the surface, the two boats lower the net at the best moment, each moving in a half circle around the fish.

This method permits quicker movement for circling the fish and for moving the bottom cable to catch the fish that are moving.

Tuna seine fishing requires a calm sea and the absence of strong currents. The limiting factor is locating the schools.

In the past, acoustic gears were tried to facilitate locating tuna schools. However, due to the shallowness of the fishing areas in the North and Central Adriatic this method did not prove useful. Several attempts were made to locate schools by plane, but there is the problem of a small fishery with few boat owners that are only periodically interested in bluefin tuna.

Number of sets during the year is quite variable from one year to the next as well as from one boat to the next, due to the number of days at sea.

The fish caught are quickly pulled on-board and then brought to the nearest port. They are then put on trucks called in by radio and then follow different commercial routes (wholesalers, auction, export, canneries, freezing, etc.). It is, therefore, impossible to follow all the fish.

6. CATCH AND EFFORT

Since landing can be carried out in all ports (there is a port every 15-20 km) and at any time by a variable number of boats, it is very difficult to assess the quantities of fish caught, the size of the fish and the fishing effort. This causes low reliability on catch statistics that only include fish that go to wholesalers or estimates by the port bureaus. This leads to a general underestimate of catches or to a double or triple estimation made at the same time at the boat's base port, at the landing port and at the wholesalers.

At the Laboratory in Fano, data from the quantity caught in each set and the size of fish collected directly from various fishermen by Profs. Sella, Scaccini and myself are available.

In general, these are not total Adriatic catch figures, but the total catch for several boats with which personal contact has been made.

Based on experience, it can be estimated that from 1932 to 1978, Italian bluefin catch figures varied between 300 and 500 MT per year, with fluctuations from 0 to 1000 MT. Tuna caught by Yugoslavian vessels, approximately the same amount, should be added to these amounts.

No clear catch trend seems to exist; there is a large variation from one year to the next. For example, 1933 and 1934 were considered low-catch years by the fishermen as compared to 1932. 1977 and 1978, with low catches, were considered poor years by the Italian fishermen. However, the same years were good ones for the Yugoslavian fishermen.

All this indicates that the numerous factors which influence the presence and the catchability of bluefin tuna make this a random fishery and it is very difficult to find an abundance index. The lack of fishing effort data in time and the variability of its efficiency does not allow for any precise indication.

In effect, if this century is considered, it can be seen that in 1900 approximately 30 fixed installations (traps) for tuna fishing existed, in addition to an unknown number of small boats with mobile nets. Around 1930, the number of fixed installations diminished but in addition to the small boats with mobile nets two Italian boats (and 5 Yugoslavian boats) operated almost all year with seine nets. In 1950, fixed installations on the Yugoslavian coast decreased to 17 and the number of small boats almost disappeared. On the Italian side, there was a certain number (4-5) of boats that fished by seine all year, along with a high, but variable, amount of boats that fished only when tuna were present in the area.

During this period, along the Yugoslvaian coasts there was a large number of tuna vessels (34 in 1950). After 1970, there was fishing only by vessels which occasionally used seine nets.

7. BIOLOGICAL DATA ON FISH CAUGHT

The majority of the bluefin tuna caught in the Adriatic Sea are young. This has been constant throughout the years. In effect, there are very few fish caught that are more than 50 kg and only several specimens of more than 150 kg are caught each year.

In Table 1, the weight of the fish caught are indicated, broken down by years for which data are available.

The fishery is carried out on fish that are immature and not spawning. Bluefin spawn in July in the central and southern zones of the Adriatic, even though at the beginning of the century the semi-fixed nets in the North caught adult males, and females with developed ovaries. Very often the fish are caught when they are searching for food (anchovies or sardines). It seems that small-sized tunas have seasonal movements, since they are present during the winter south of Pescara, where there is greater depth with water temperatures of approximately 13 degrees. During the Spring, they travel up the Yugoslavian coasts toward the North, perhaps following the same movements as anchovies (Piccinetti, 1970). They then remain in the North Adriatic until October when they disappear. During the summer, tuna are more abundant in areas where anchovies are abundant.

8. COMMERCIALIZATION

Tuna are sold in various ways, depending on the boat. Some vessels have a contract with wholesalers that buy all the fish caught at a price that is fixed for the entire year, or variable according to the month. Other vessels sell a part of the catch to one or to several wholesalers, while another part is sold to auctioneers. Recently, a group of boats has given the sale of the fish to a cooperative that is already doing this for sardines and anchovies. This organization sells the fish, or if the market is not good, they freeze the tuna.

The price of tuna between 8 and 40 kg for the fishermen is approximately 2000 liras per kilo for the whole fish. Prices are higher at the beginning of the season (April-May) and lower in August-September,

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Table 1. Observations on the fishing of bluefin tuna by seine net during different periods.

Year	No. of sets considered	No. of tunas	total weight (Kg.)	Breakdown of tunas (in %) by weight class						
				2-5 Kg.	6-10 Kg.	11-17 Kg.	18-30 Kg.	31-45 Kg.	46-60 Kg.	More than 61 Kg.
1932	1	3619	49575	74.7	-	-	13.8	-	7.6	3.9
1933	8	3963	25388	50.2	49.8	-	-	-	-	-
1934	16	3972	21034	87.3	11.9	-	-	-	-	0.8
1935	16	2657	38683	59.8	3.1	16.7	8.0	4.2	2.6	5.6
1953	8	721	3265	91.1	-	5.1	3.6	-	-	0.2
1954	50	24953	175715	46.8	49.9	2.5	0.8	-	-	-
1955	7	1589	7123	90.0	7.3	2.7	-	-	-	-
1956	5	172	2722	14.0	-	34.3	51.7	-	-	-
1957	12	2402	14455	88.0	1.2	9.5	1.1	0.2	-	-
1958	8	2940	21895	61.3	19.1	19.6	-	-	-	-
1971	12	849	11166	-	26.0	61.7	10.1	2.2	-	-
1972	13	6352	94600	2.5	18.2	57.4	21.9	-	-	-
1973	38	7794	117048	-	35.2	47.7	12.8	1.4	0.4	2.5
1976	40	40947	596913	1.4	19.3	47.6	30.9	0.5	-	0.3
1977	8	4901	47362	38.1	46.6	-	15.3	-	-	-
1978	12	6437	125425	-	-	52.5	46.9	0.2	-	0.4