BONITO, *SARDA SARDA* LINNAEUS

The bonito is a wide-spread fish species in the Black Sea, Marmara, Aegean and Mediterranean Seas. It migrates in a similar way to the mackerel. In spring the fish enter the Black Sea for feeding and spawning and in late autumn turn back for wintering in the Marmara and Aegean Seas. They attain sexual maturity at 1 to 2 years of age and at lengths of 40-45 cm. This fish species has a short life span and a high growth rate. The maximum length and weight the bonito approaches are 103 cm and 9.7 kg respectively (Nikolov, 1960; Ivanov and Beverton, 1985).

In **Table 84** the bonito landings in the Black Sea during the period 1950-1992 (in tonnes) are shown.

TABLE 84. Bonito landings in the Black Sea during 1950-1992 (in tonnes)

Years	Bulgaria	Romania	former USSR	Turkey	Total
1950	450.7	10.0	40.0	5695.0*	6195.7*
1951	37.4	1.0	40.0	1752.0	1830.4
1952	152.5	0.0	30.0	3505.0	3687.5
1953	308.6	1.0	20.0	9200.0	9529.6
1954	2192.2	93.0	250.0	14700.0	17235.2
1955	1033.9	164.0	1540.0	49200.0	51937.9
1956	1405.1	306.0	5580.0	55500.0	62791.1
1957	1015.1	317.0	8630.0	39900.0	49862.1
1958	1110.3	164.0	4180.0	27200.0	32654.3
1959	1034.9	40.0	200.0	19650.0	20924.9
1960	3193.6	171.0	210.0	12100.0	15674.6
1961	532.2	47.0	350.0	42900.0	43829.2
1962	34.8	10.0	10.0	4600.0	4654.8
1963	248.1	0.0	20.0	20400.0*	20668.1*
1964	562.7	1.0	10.0	6959.2	7532.9
1965	1683.1	14.0	40.0	12800.0	14537.1
1966	1475.0	4.0	270.0	9320.0	11069.0
1967	2281.1	1.0	30.0	8813.9	11126.0
1968	1015.4	1.0	20.0	9730.4	10766.8
1969	1576.4	2.0	10.0	18750.9	20339.3
1970	29.6	0.0	0.0	13082.0	13111.6
1971	40.6	0.0	0.0	20835.0	20875.6
1972	0.0	0.0	0.0	10091.9	10091.9
1973	27.7	0.0	0.0	3208.2	3235.9
1974	15.6	0.0	0.0	3786.2	3801.8
1975	0.4	0.0	0.0	3073.0	3073.4
1976	39.8	0.0	0.0	2383.2	2423.0
1977	44.2	0.0	0.0	3493.5	3537.7
1978	10.7	0.0	0.0	4079.4	4090.1
1979	0.7	0.0	0.0	8075.8	8076.5
1980	13.4	0.0	0.0	13486.4	13499.8
1981	190.7	0.0	0.0	757.0	947.7
1982	3.3	0.0	0.0	18415.0	18418.3
1983	23.6	0.0	0.0	23206.0	23229.6
1984	0.9	0.0	0.0	2258.0	2258.9
1985	0.7	0.0	0.0	10668.0	10668.7
1986	0.2	0.0	0.0	8327.0	8327.2
1987	13.1	0.0	0.0	13140.0	13153.1
1988	0.0	0.0	0.0	13596.0	13596.0
1989	0.5	0.0	0.0	3803.0	3803.5
1990	16.7	0.0	0.0	11207.0	11223.7
1991	0.0	0.0	0.0	15857.0	15857.0
1992	0.0	0.0	0.0	6211.0	6211.0

* Turkish landings during the period 1950-1963 are considered in the four above-mentioned seas.

The magnitude of Turkish bonito catches, by regions, during 1967-1992 are presented in **Table 85**.

It is seen that during the period 1967-1992 the average bonito catches in the Black Sea (9 628.3 tonnes) represented 72.37% of the average total catch (13 306.6 tonnes). Next in size were the catches in the Sea of Marmara: 23.06% (3 067.1 tonnes), while those in the Aegean and Mediterranean Seas were insignificant (overall 4.57%).

It appears from the above that even at present bonito landings are highest in the Black Sea. Because of this, the fact that the bonito does not migrate towards the north-western part of the basin proves its increasing pollution and arises a certain interest. This is presumably the major reason for the sharp decline of bonito catches along Bulgarian, Romanian and the former USSR coasts.

TABLE 85. Turkish landings of bonito by regions during 1967-1992 (in tonnes)

Year	Eastern part of Bl. Sea	Western part of Bl. Sea	Black Sea Total	Sea of Marmara	Aegean Sea	Medi-terra-nean	Grand Total
1967	-	-	8813.9	10179.4	107.2	33.2	19133.7
1968	-	-	9730.4	9027.2	154.9	112.6	19025.1
1969	-	-	18750.9	27969.2	157.9	69.0	46947.0
1970	12485.7	596.3	13082.0	2476.2	214.7	59.3	15832.2
1971	19935.1	899.9	20835.0	2829.1	35.0	16.4	23800.5
1972	9245.6	846.3	10091.9	1534.3	31.9	96.9	11755.0
1973	2269.2	939.0	3208.2	327.1	73.3	45.0	3653.6
1974	3260.7	525.5	3786.2	1337.7	91.1	71.6	5286.6
1975	2398.6	674.4	3073.0	846.9	148.5	71.6	4140.0
1976	1554.7	828.5	2383.2	362.5	207.0	72.3	3025.0
1977	1161.9	2331.6	3493.5	663.6	77.9	103.5	4338.5
1978	1450.9	2628.5	4079.4	1013.5	174.6	163.2	5430.7
1979	7294.3	781.5	8075.8	283.1	82.0	198.3	8639.2
1980	11604.6	1881.8	13486.4	939.2	151.2	333.2	14910.0
1981	306.0	451.0	757.0	332.0	17.0	20.0	1126.0
1982	7928.0	10487.0	18415.0	4502.0	393.0	87.0	23397.0
1983	8538.0	14668.0	23206.0	5072.0	635.0	121.0	29034.0
1984	520.0	1738.0	2258.0	4064.0	812.0	86.0	7220.0
1985	7178.0	3490.0	10668.0	835.0	524.0	254.0	12281.0
1986	3313.0	5014.0	8327.0	1387.0	630.0	412.0	10756.0
1987	5228.0	7912.0	13140.0	2189.0	994.0	650.0	16973.0
1988	5556.0	8040.0	13596.0	1317.0	2122.0	578.0	17613.0
1989	1936.0	1867.0	3803.0	492.0	156.0	216.0	4667.0
1990	4057.0	7150.0	11207.0	1942.0	863.0	375.0	14387.0
1991	7006.0	8851.0	15857.0	2009.0	986.0	299.0	19151.0
1992	3394.0	2817.0	6211.0	1014.0	880.0	549.0	8654.0
Average			9628.3	3067.1	412.3	195.9	13306.6
%			72.37	23.06	3.10	1.47	100.00

Precise recent estimates for bonito biomass are not available. According to Ivanov and Beverton (1985) it varies between 10 000 and 200 000 tonnes.

As it is well-known, the bonito forages primarily on anchovy, horse mackerel, young mackerel and considerably less on sprat, blotched pickerel, young mullets, etc. For this reason the bonito holds a significant place in the trophic interrelations between pelagic fishes. However the lack of regular biological research on this species does not permit the use of a number of biostatistical methods. That is why before such data become available the bonito biomass should be roughly assessed by scientific cruises, mainly in the Sea of Marmara during the time of its overwintering.