

International Consultations on the Establishment of the  
South Pacific Regional Fisheries Management Organisation



**NATIONAL FISHERY INSTITUTE  
ECUADOR**

**Jack-Mackerel (*Trachurus murphyi*); fishery and  
biological aspects in ecuadorian waters**

**INTRODUCTION**

The Pacific Ocean is characterized to present a transition zone between the tropical and subtropical regimens, at this zone of fishery commercial importance, small pelagic fishes as chub mackerel (*Scomber japonicus*), thread herring (*Opisthonema* spp), Pacific anchoveta (*Cetengraulis mysticetus*), Frigate tuna (*Auxis thazard*), Round herring (*Etrumeus teres*) are distributed and caught by the purseine fleet. This species are distributed along the cost of Ecuador, registering the most concentrations at the Gulf of Guayaquil and the minor catches in front of Manabi coast. (González and Miranda, 1999).

In Ecuador the small pelagic fishery represent the most important fishery resource due to the comercial and social importance. Its landings, processing (canned fish and flour fish) and exportations generate an important income to the country.

This sampling comes from the small pelagic fish program (National Fisheries Institute – Ecuador), with the target to collect the fishery and biological information and its processing and anlysis as well. In base of this monitoring program it can be determined the situation of fishery in order to propose recomendations for a sustainable explotación of one specie.

**FISHERIES ASPECTS**

The Jack-Mackerel landings represented decreasing trends along the time; Nevertheles, it can be observed a minimum increasing in its landings for 2001 year. The fluctuations of the sea surface temperature (SST) and ocean conditions during 1997-1998 period (El Niño Southern Oscilation - ENSO) influenced probably in landings (Figure 1).

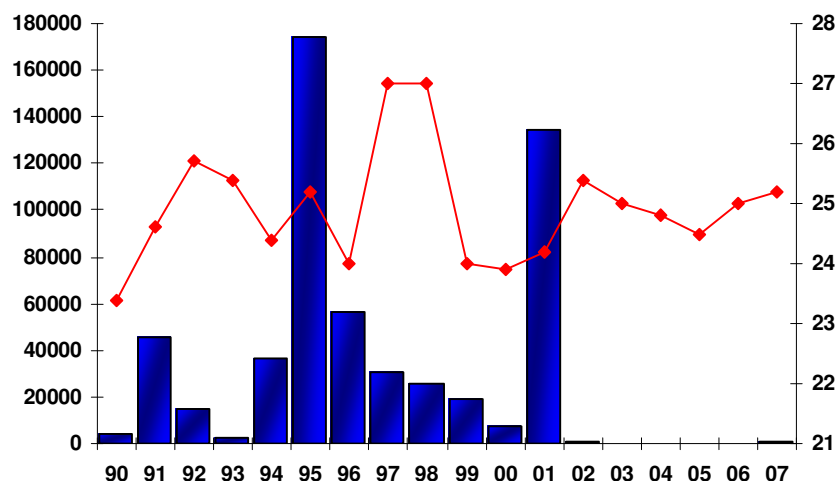


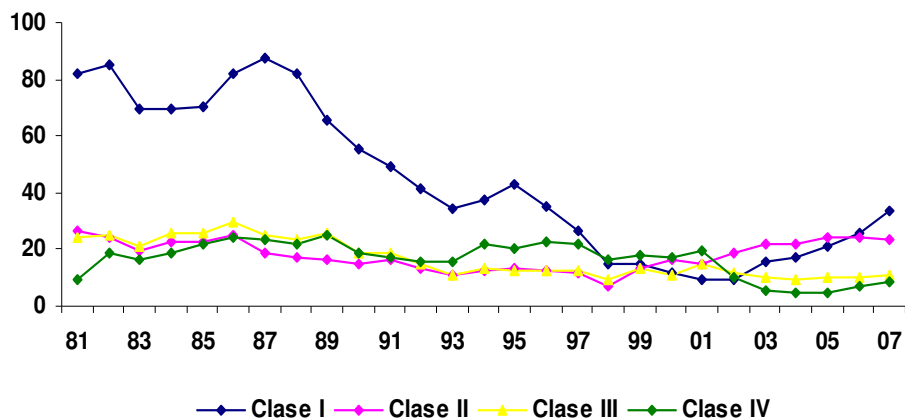
Figure 1. Trends in landings of Jack-Mackerel and sea temperature during 1990 to 2007

During 2001 year, Jack-Mackerel catches represented 30,8 % of the total landings of small pelagic fishes, on the other hand for 2002 year was registered a very significant decreasing (0,3 %). In the 2003 and 2004 year has not been records of Jack-Mackerel catches, nevertheless for 2007 were observed catches around 0.4% of the total landing (Table 1).

**Table 1. Percentage of small pelagi fish landing during 2002 to 2004**

SPECIES/YEAR	2001	2002	2003	2004	2005	2006	2007
South American pilchard	9,7	1,1	0,3	0,3	0,0	0,0	0,0
Chub Mackerel	19,6	9,5	16,5	29,4	49,0	16,9	20,0
Round herring	0,0	0,3	0,5	2,8	2,0	0,2	0,2
Pacific anchoveta	16,9	10,2	9,7	2,9	4,1	5,5	0,5
thread herring	4,6	6,1	3,4	4,9	3,5	7,6	6,6
Anchovy	0,0	39,5	16,6	6,4	16,9	34,3	27,5
Frigate tuna	1,3	5,4	18,1	11,2	2,8	5,8	11,7
Jack-Mackerel	30,8	0,3	0,0	0,0	0,0	0,0	0,4
Others	17,1	27,6	34,8	42,1	21,7	29,7	33,1
<b>TOTAL (%)</b>	<b>100,0</b>	<b>100,0</b>	<b>100,0</b>	<b>100,0</b>	<b>100,0</b>	<b>100,0</b>	<b>100,0</b>

The higher costs for fishing and the the low disponibility of resource made the purseine fleet keeping in the last years low levels of activity (Figure 2).



**Figure 2. Dynamic of Purse Seine fleet, 1981 al 2005 period**

Due of lack of a continuos monitoring, it can be observed significant differences in the mean length of catch.

In 1989 was registered a mean length of 23.5 cm TL. In 1996 increased to 30.6 cm TL. And for 2007 decreased to 29.5 cm TL, and for the period of 1999–2001 the mean length of catch had a decreasing trends to 25.7 cm TL. We can mention the mean length of catch for Jack-Mackerel (*Trachurus murphyi*) for Peru was 31 cm TL<sup>1</sup>, taking this value as a point of reference, it can indicate that the most of individuals in the catch in ecuadorian waters were under the minimum length of catch, with the exception of 1996 year (Table 2).

<sup>1</sup> Value taken from IMARPE Web site

Table 2. Mean length of catch (MLC)

YEAR	MEAN LENGTH (cm, TL)
1989	23,55
1996	30,64
1997	29,55
1999	27,31
2000	28,01
2001	25,78

## BIOLOGICAL ASPECTS

During the monitoring in 1989, it was determined mostly young individuals, for 1996 in the catches composition was determined a higher presence of individuals over 30 cm TL. In 1997 the length frequency distribution showed three modal groups associated to three probably age groups. For the 1999 -2000 period the lengths distributions was from 23 to 35 cm TL, showing a modal group (26 cm TL). In 2001 year the length distribution was between 22 to 34 cm TL with a modal groups of 24 cm TL, being minor than year before (Figure 3).

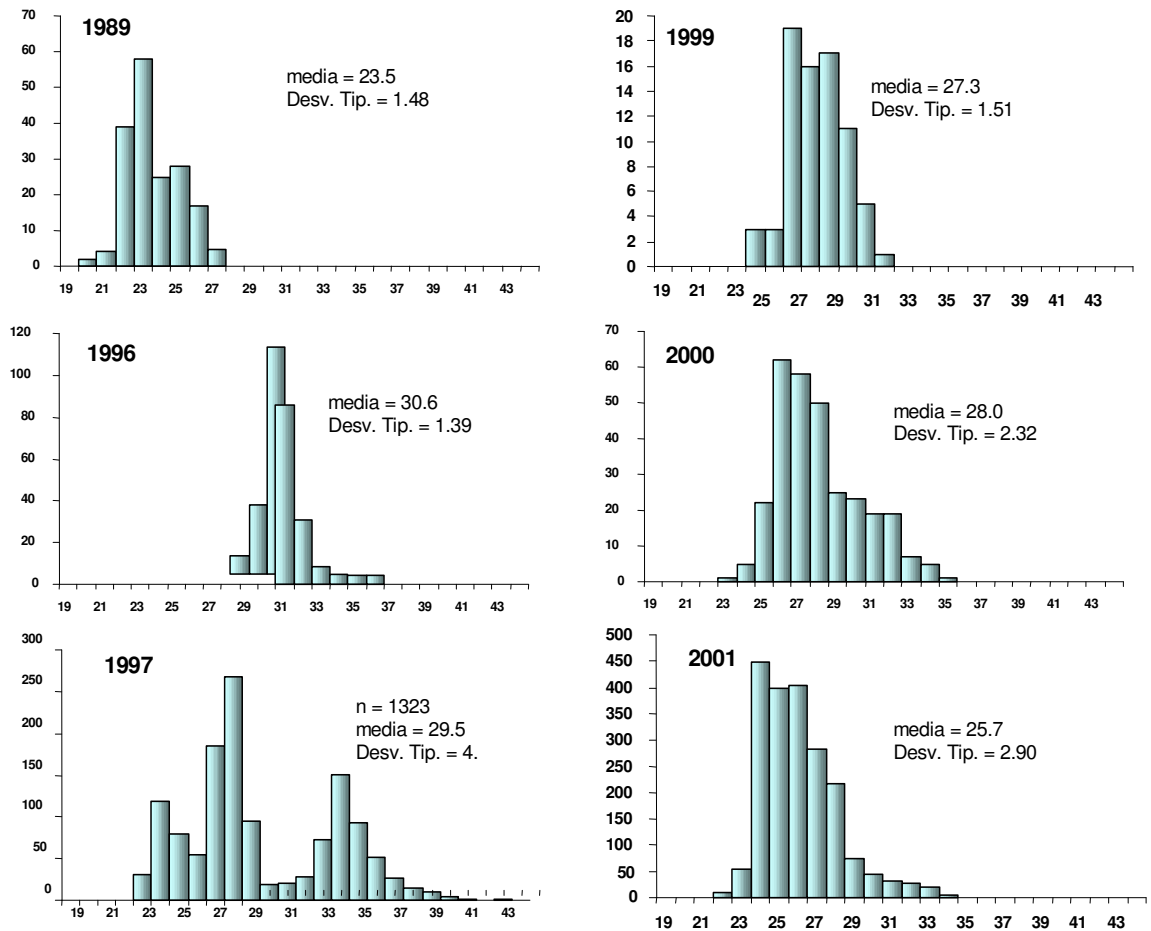


Figure 3 Length Frequency Distribution of Jack-Mackerel

In the case of sex ratio (Figure 4), it was determined for the 1996–1997 and 2000 periods a male-female relationship of 1 to 1.

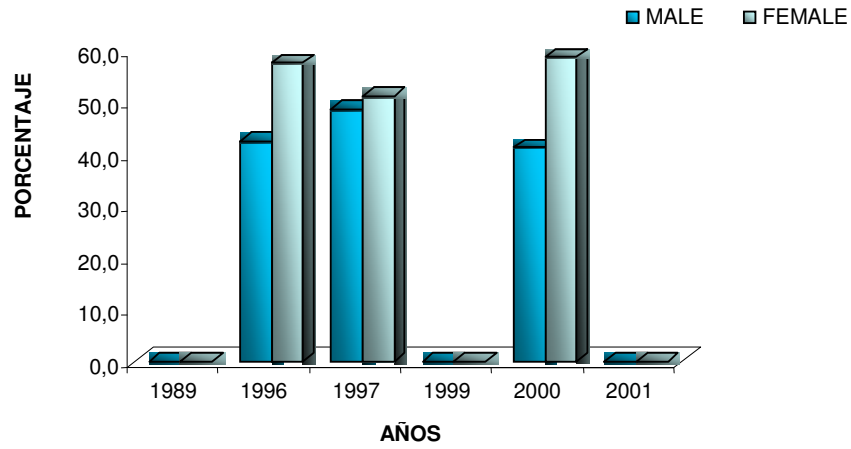
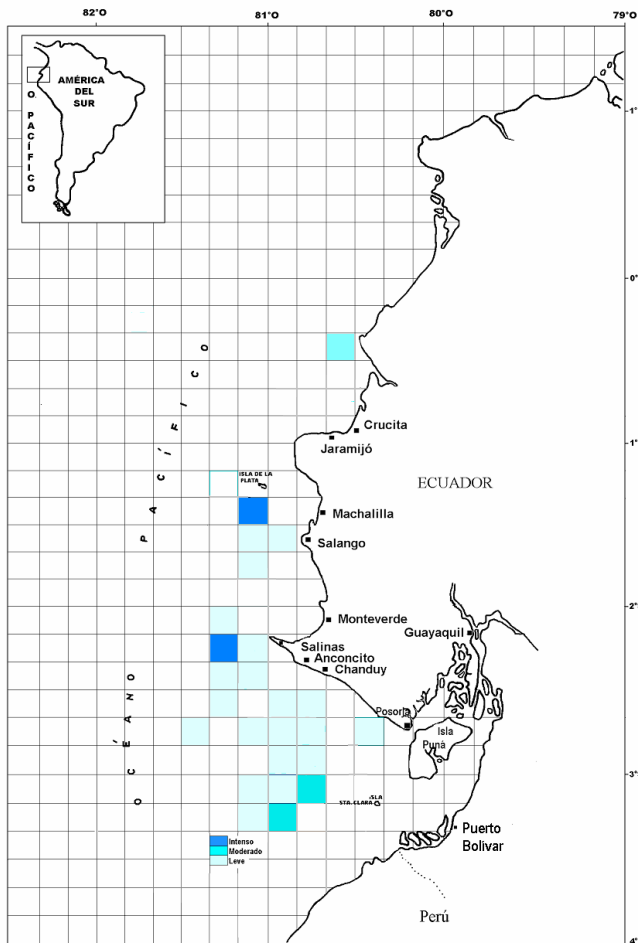


Figure. 4. Sex Ratio for Jack-Mackerel

**FISHING AREAS**



The purseine fleet was located in zones near to Crucita, Salango, Machalilla, Salinas, Anconcito, Chanduy, Posorja, and Puerto Bolívar. The figure 5 show this areas and the fishing intensity during 1989, 1996, 1999, 2000 and 2001 years.

Figure 5 Fishing areas of purseine fleet, during 1989, 1996, 1999, 2000 and 2001 years.

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