South Pacific Regional Fisheries Management Organisation

11th Meeting of the Science Working Group

Lima, Peru, 15-19 October 2012

SWG-11-08 (rev 1)

Peru 2012 Report

PERU

REPORT ON THE FISHING ACTIVITIES OF THE PERUVIAN FLEET IN THE AREA OF THE SOUTH PACIFIC REGIONAL FISHERIES MANAGEMENT ORGANIZATION (SPRFMO)

2012

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1. DESCRIPTION OF THE FISHERY

1.1. Study Area and Structure of the fleet

The fishing operations were performed off Peru and Chile, starting in a distance of 200 nm and up to 1300 nm from the coast, in the area encompassed between 15º00'S and 41º44'2 S and 86º17'3 W and 101º28'1 W, in areas with a minimum sea surface temperature of 9.5ºC and a maximum of 12.2º with an average of 11.5ºC, and a minimum temperature at the depth of the school (at 70 to 150m) of 9.4ºC and maximum of 12.2ºC.

During recent years the Peruvian fleet registered for the capture of jack mackerel in high seas, was constituted by 88 to 92 vessels, from which 79 correspond to purse seiners with an average holding capacity of 491m^3, 7 trawlers with an average holding capacity of 3 897 m^3 and 6 multipurpose vessels (purse seine/trawler) with an average holding capacity of 1691 m^3 (Table 1).

Table I. Peruvian Fleet registered to develop fishing effort in the SPRFMO area during the period 2010 – June 2012

Year	Number of vessels	Fishing Gear Types	Holding capacity average (m^3)
2010	79	Purse seine	491
	8	Trawl	5 945
	5	Purse seine/Trawl	1 828
2011	79	Purse seine	491
	4	Trawl	3 885
	5	Purse seine/Trawl	1 828
2012	79	Purse seine	491
	7	Trawl	3 897
	6	Purse seine/Trawl	1 691

From a total of 92 registered vessels, only the trawlers and multipurpose vessels operated between 2010 and 2012 (Table II). In 2010 there were 11 vessels with 600 fishing days and 1300 tows/sets, in 2011 only 1 vessel operated with 12 fishing days and 15 tows, and in 2012 (as of June 2012) there were 6 vessels with 180 fishing days and 315 tows/sets.

Table II. Peruvian operatives fleet in the area of OROP during the period 2010 – June 2012

Year	Number of vessels	Fishing Gear Types	Holding capacity average (m^3)
2010	7	Trawl	6 293
	4	Purse seine/Trawl	1 914
2011	1	Trawl	1 240
2012	1	Trawl	2 436
	5	Purse seine/Trawl	1 733

1.2. Annual Catches and fishing areas.

During the last three years the annual catch of jack mackerel in the SPRFMO area fluctuated between 14 and 40 516 tons, with a noticeable decline in 2011, year that registered the lowest fishing effort with an annual total catch of only 14 tons. From January to June 2, the catches of jack mackerel increased, reaching 2996 tons with the operation of only 6 fishing vessels (Table III).

Table III. REPORTS OF MONTHLY CATCHES OF JACK MACKEREL IN THE SPRFMO AREA DURING 2010 - 2012

YEAR 2010 Vessel Name	March	April	May	June	July	August	September	Total (t)
Franzisca	195	1 488	342	241				2 266
Ila	2	72	38	49	80	4		245
Pacific Conqueror		1 790	1 250	2 024	2 750	640		8 454
Pacific Hunter		1 518	1 294	1 620	2 165	480		7 077
Pacific Voyaguer		2 530	1 620	1 900	2 830	1 620		10 500
Pacific Champion	15	1 688	1 366	750	2 280	360		6 459
Pacific Sheriff			1 036	342				1 378
Pacific Keeper			948					948
Pacific Leader			1 231	1 184				2 415
Pacific Peace			426	338				764
Westella			10					10
Total 2010	212	9 086	9 561	8 448	10 105	3 104	0	40 516
YEAR 2011 Vessel Name	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**Total (t)**
Ila						6	8	14
Total 2011	0	0	0	0	0	6	8	14
YEAR 2012 Vessel Name	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**Total (t)**
Pacific Champion	165		403	32				600
Pacific Conqueror	60	220						280
Pacific Hunter	85	380	305	47				817
Pacific Sheriff		357	145					502
Enterprise	28	183	220	21				452
Liafjord		210	135					345
Total 2012	338	1 350	1 208	100	0	0	0	2 996

2. CATCH, EFFORT AND CPUE IN THE JACK MACKEREL FISHERY

2.1. Catch trends

The reports on monthly landings of jack mackerel and chub mackerel in the period January 2010 – May 2012 in the High Seas zone showed a clear decreasing trend, with minimum catches in 2010 (Fig. 1) due to the reduced fishing effort and the low availability of jack mackerel and chub mackerel. This situation was similar to the one observed in the whole Eastern Pacific, which lead to the adoption of interim conservation and management measures within the framework of the SPRFMO. Nevertheless, in the first semester of 2012 there was a change in the observed trend with an increase of the jack mackerel availability.

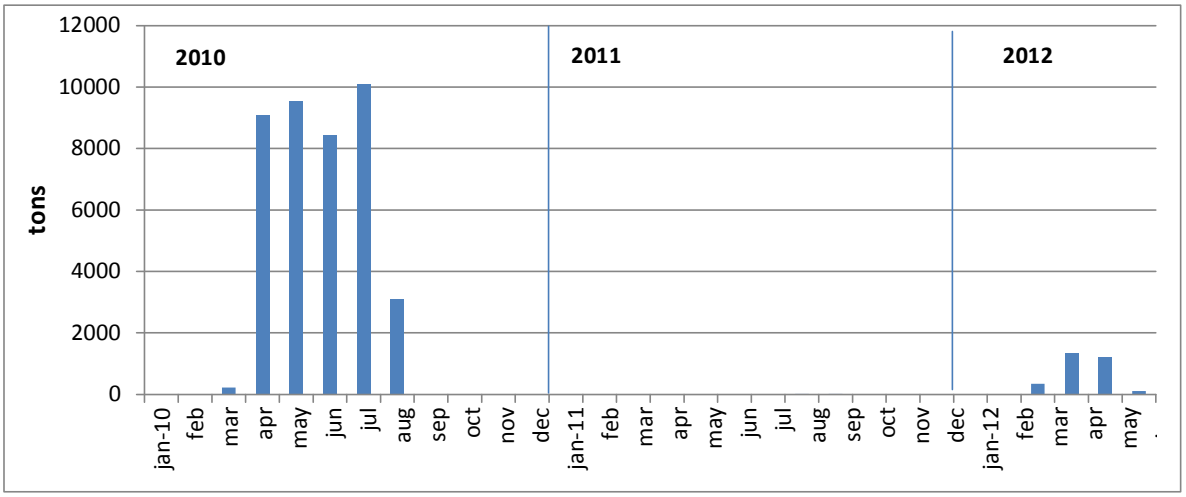

Figure 1: Capture of Jack mackerel in high seas by the Peruvian fleet 2010 – June 2012

A key aspect in the development of the fishing activities on the transboundary stocks of jack mackerel and chub mackerel by the Peruvian fleet in the high seas was the entering into force of the Supreme Decree (D.S. 022-2009, dated 09-06-2009) that promoted the participation of a Peruvian fleet in this fishery with due regard for the application of the principles of the Code of Conduct on Responsible Fishing and in accordance with the national and international laws.

2.2. Fishing effort trends

The fishing effort in the jack mackerel fishery expressed in terms of number of vessels decreased from 11 vessels in 2010 to 6 in 2012 (Figure 2). The holding capacity of these vessels expressed in m^3 decreased by 53% between 2010 and 2012.

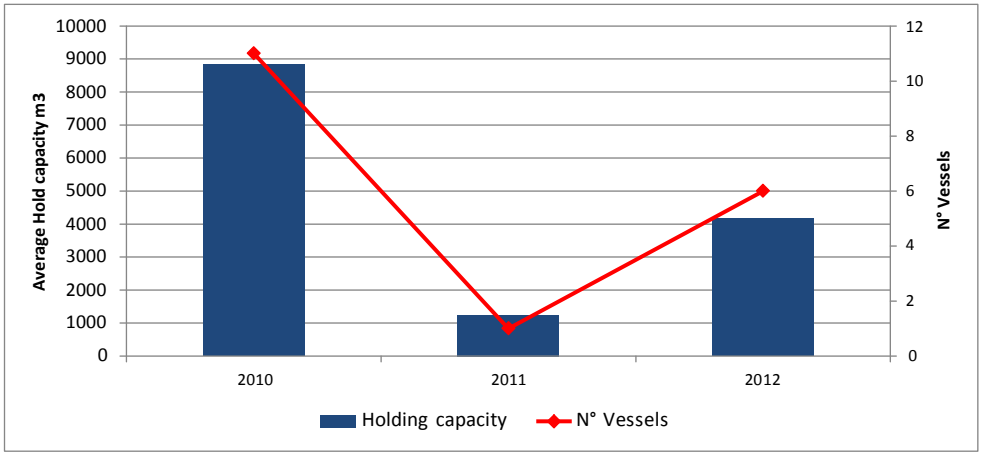

Figure 2: Number of vessels and average holding capacity of the Peruvian fleet fishing in the high seas, period 2010 – June 2012

2.3. CPUE trends

Two of the available measures of CPUEs from the high seas jack mackerel fishery, expressed in terms of catch per tow (catch/tow) and catch per fishing day (catch/day), have similar trends, with very low values in 2011 and higher in 2010 and 2012, with the catch/tow in 2012 being on the overall much higher than the two previous years (Figure 3)

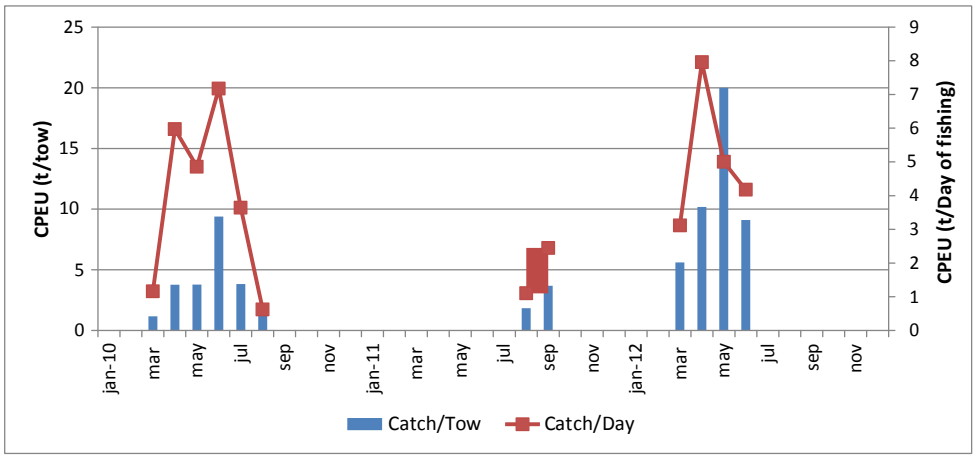

Figure 3: CPUE estimates for jack mackerel in catch in tons per tow (blue solid line) and per fishing day (red line with dots), period 2010 – June 2012.

The CPUE estimates of catch per towing time (catch/tow-hour) also show a noticeable increase in overall values in 2012 with respect to 2010 and 2011, although the values for June 2010 and June 2012 were fairly similar (Fig. 4).

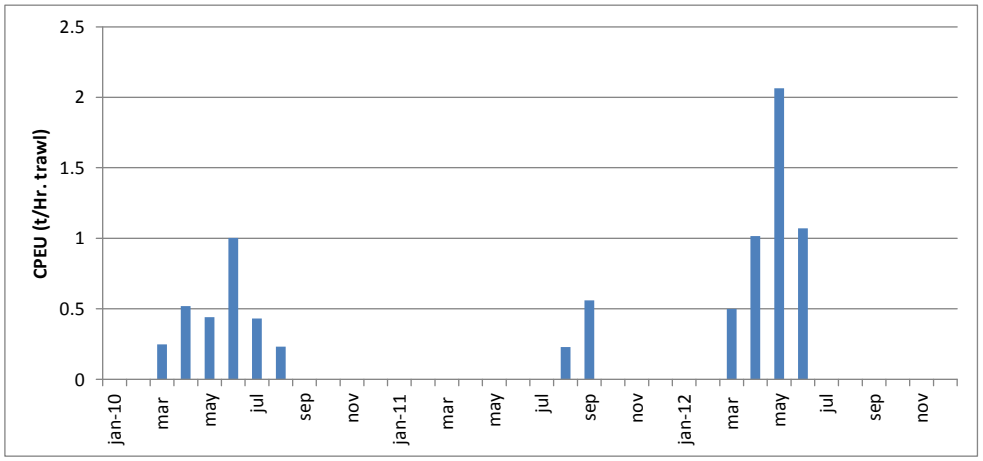

Figure 4: Estimates of CPUE for jack mackerel in catch in tons per trawling time (hour), period 2010-2012

3. BIOLOGICAL INFORMATION

3.1 Biological sampling

Some biological information on jack mackerel and chub mackerel is collected from samples taken on board Peruvian fishing vessels operating in the SPRFMO area. Information on species composition of the catches and biometric information of species caught is collected through a sampling program that includes the whole fleet. The biometric sampling provides information on the size frequency distribution in the catches (total length in cm), as well as sex ratio, sexual maturity, length weight relationship, etc. Some of the results of these observations, particularly on size frequency distributions are presented elsewhere in this report.

Additionally, during a research survey for giant squid (*Dosidiscus gigas*) with the B/P Hakurei Maru N° 8, it was possible to obtain information of early life stages and juveniles of jack mackerel in stomach contents of squid. This cruise was carried out off Peru, from mid November 2010 to January 2011**.**

3.2 Distribution and concentration of jack mackerel in 2010

A very important aspect in the distribution of jack mackerel off Peru is the one referred to the influence that changes in the direction, speed and persistence of the superficial and/or sub superficial currents have on the distribution of the jack mackerel, which are particularly important in certain years and seasons. .

During the research survey with the B/P Hakurei Maru N°8 carried over from mid November 2010 and January 2011 off Peru (Fig. 5), and the survey found jack mackerel in the stomach content of giant squid (*Dosidiscus gigas*) at 200 miles from the coast between latitude 05°S and 07°S, (IMARPE 2011).

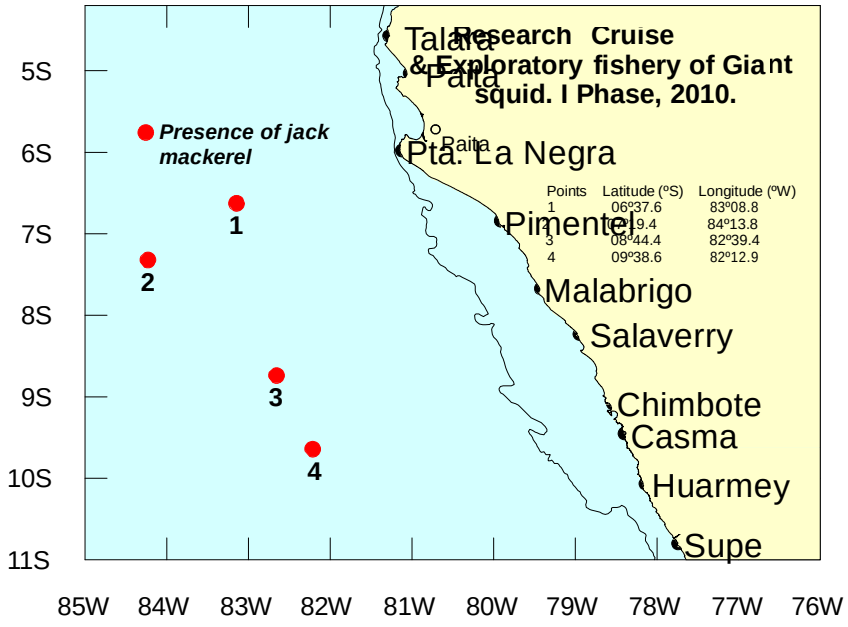

Fig. 5. Presence of jack mackerel in the stomach content of giant squid during the B/P Hakurei Maru surveys, November-December 2010

During 2010 the Peruvian fleet operated in a rather wide area that included some catches of juveniles in the high seas off southern Peru (Fig. 6). These findings are important because it confirmed the presence of a group of juveniles with a modal size in 19 cm. total length, which is amongst the smallest sizes reported for the high seas in the Southern Pacific

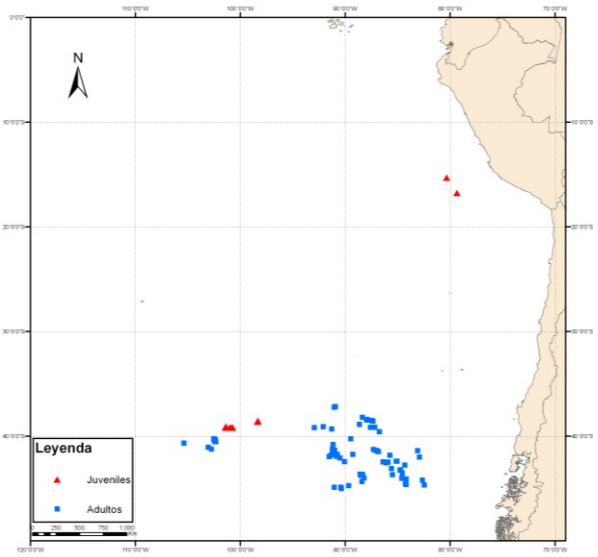

Figure 6: Distribution of jack mackerel from the fish catches of the Peruvian fleet in high seas during 2010.

3.3. Distribution and concentration of jack mackerel in 2011

Fishing operations during 2011 were drastically reduced due to a lower availability of jack mackerel in the high seas and were concentrated in the high seas off center-south Chile (Fig. 7). A similar situation was reported by all the fishing fleets fishing in the SPRFMO area,

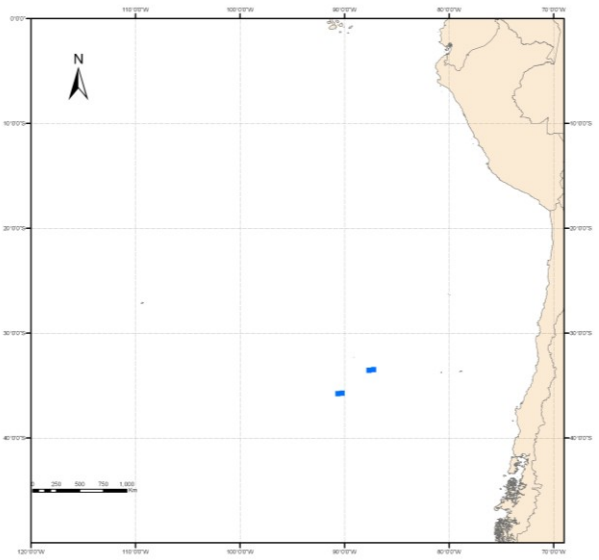

Figure 7: Distribution of jack mackerel from catches of the Peruvian fleet in the high seas during 2011

3.4. Distribution and concentration of Jack mackerel during 2012

An increase in the availability of jack mackerel caused an increase in the fishing effort and catches as well as an expansion of the fishing area during in 2012, with a noticeable displacement towards south, south of the 040ºS (Figure 8).

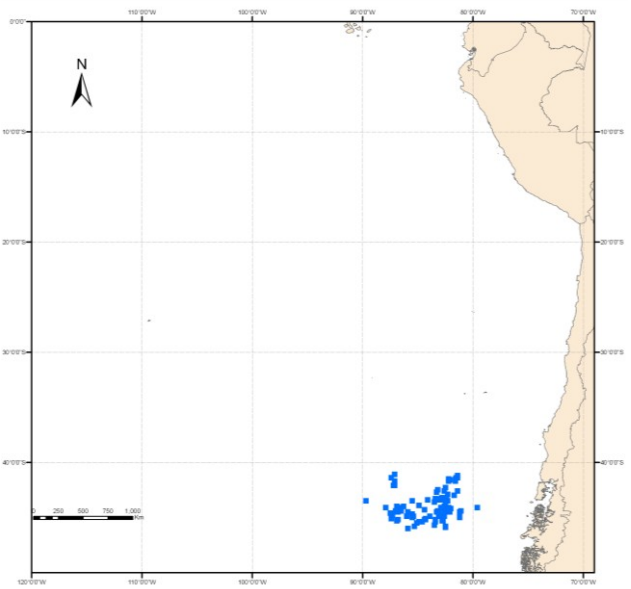

Figure 8: Distribution of jack mackerel from the fish catches of the Peruvian fleet in high seas during 2012

3.5. Length and age frequency distribution in the catches

The length structure of the jack mackerel caught by the Peruvian fleet during 2010, 2011 and 2012 (only until May) had a range between 15 and 60 cm total length, with a general bimodal structure (Fig. 9). During 2010 there were indications of an important recruitment with a modal size of 19-20 cm in the catches off Peru, while in the catches off Chile recruitment showed a modal size of 26 cm. of total length. During 2011 and 2012, a length frequency structure exclusively conformed by adults was registered in all the zones, with a modal size of 45 cm. total length.

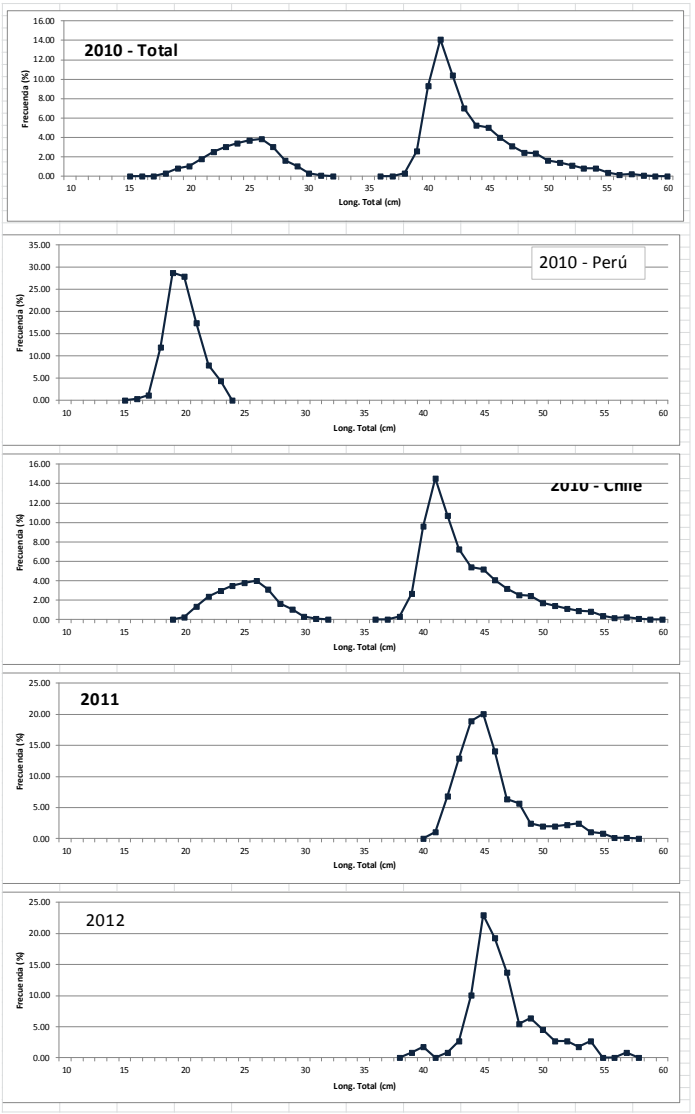

Figure 9. Length frequency distribution of jack mackerel catches by the Peruvian fleet in the high seas, period 2010 - 2012

4. RESEARCH ACTIVITIES AND DATA COLLECTION (Observations on board and sampling program)

The study area covers the high sea in the Southern Pacific Ocean, especially areas off Peru and off Chile,

The objective of the sampling program concerning the jack mackerel is to obtain the maximum number of samples with the widest geographical coverage of the fishing areas, assuming that these areas are indicative of the presence of the highest concentrations of jack mackerel. This presumably increases the

probability of obtaining representative samples of the stock or stocks being studied.

The researches on Jack mackerel in High seas include the following Programs:

Pelagic Resources Monitoring Program:

The main objective in this program is to obtaining information on effort, composition by species and volume of capture. This monitoring program integrates data of different sources such as: biological sampling on board and satellite positioning system of fishing vessels. The results gave information about the fishing zones, indexes of CPUE, fish distribution, and size structure, sexual maturity and sea surface temperature.

The biological information was obtained by stratified sampling made in two steps, where 10 individuals of each rank are considered. With this sampling, information about length, weight, sexual maturity and gonads weight is obtained. Special samples of ovaries, otoliths and stomachs are also obtained for further studies on reproduction, growth and feeding

Fishing Logbook Program:

This is a program of observers on board, duly trained to monitor de fishing fleet directed to the jack mackerel in the Southern Pacific. The subjects of the monitoring are: effective effort, discharges, collection of biological data, observation of superior depredators, acoustic registry data, among others.