National report of the European Union to the 2011 SPRFMO Science Working Group.

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1 Introduction

This report describes the activities of the EU pelagic fleet in the Pacific in 2010 and in the first half of 2011. As the fishing season of the EU vessels in 2011 was discontinued already in June, the figures presented in this report for 2011 can in some cases be considered as the final results for this year.

The pelagic fleet from the European Union (EU) in the Pacific targets primarily jack mackerel (Trachurus murphyi). In 2010 and 2011, the EU fleet consisted of two components: the PFA fleet (Pelagic Freezertrawler Association) and the Polish fleet. The PFA vessels worked under German, Lithuanian and Dutch flag, but they had a similar fishing method and strategy. This fleet has been active in the area since 2005. The Polish fleet returned to the Pacific in 2009 after a long absence. This fleet worked in the area in the 1970s and 1980, but was absent from 1985 onwards.

The PFA fleet and the Polish fleet worked independently from one another, and the research activities were also separated. For this reason, the reports on both fleets are presented as separate sections in this report.

There has been no demersal fishery by EU vessels in the Pacific in 2010 and 2011.

2 The pelagic fishery by the PFA fleet in 2010 and 2011

2.1 Description of the fishery

The fishery for jack mackerel by the European Union (EU) started in 2005 by a single vessel working for 3 months in the second half of the year. The next year, the same vessel returned and worked for the whole season (March – October). Following the positive results of this season, the number of vessels increased to six in the following three years (2007 – 2009). Starting from 2010, the number of vessels was reduced as a result of declining catches. The number of PFA vessels by year and by country is presented in Table 1.

year	Number of PFA vessels	EU countries involved and number of vessels
2005	1	Netherlands (1)
2006	1	Netherlands (1)
2007	6	Germany (3), Lithuania (1), Netherlands (2)
2008	6	Germany (3), Lithuania (1), Netherlands (2)
2009	6	Germany (3), Lithuania (1), Netherlands (2)
2010	5	Germany (3), Lithuania (1), Netherlands (1)
2011	2	Germany (1), Netherlands (1)

Table 1. PFA pelagic trawlers in the Pacific in 2005 – 20011. One of the German vessels in 2009 was temporarily reflagged as Lithuanian.

The vessels involved in this fishery are large pelagic trawlers, operating under the flags of Germany, Netherlands, and Lithuania. The vessels use single boat pelagic trawls that are fished mainly during night-time. They operate exclusively in international waters outside the Chilean EEZ. Fishing operations extend in the open Pacific to about 110°W.

Over the period 2008-2011, there was a progressive shortening of the fishing season (Figure 1). In 2010, catches sharply declined in comparison to the previous year, and in 2011 the fishery was a complete failure. After one month of fishing (May) the vessels gave up and left the central eastern Pacific.

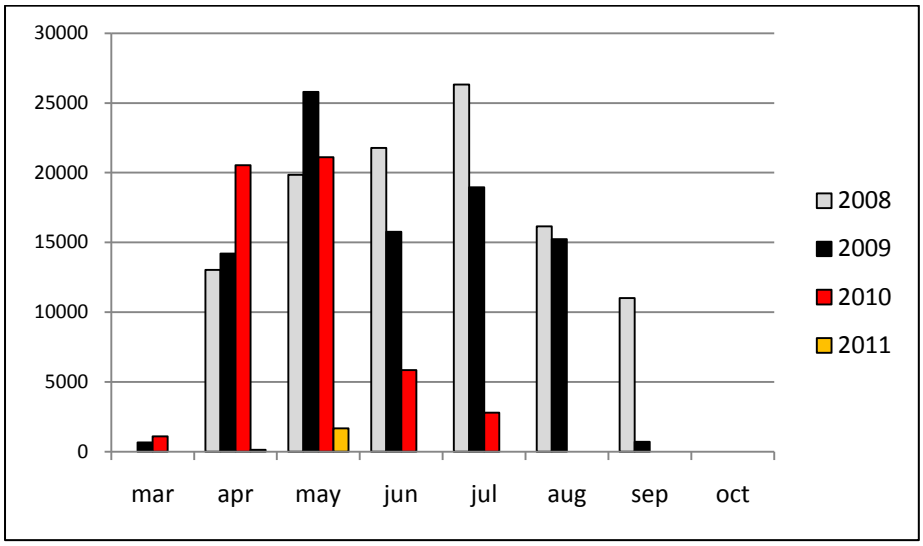

Figure 1. Monthly catches of jack mackerel by PFA vessels in 2009 compared to 2008. Data based on catches reported by vessels.

2.2 Catch, effort and CPUE in the PFA fleet

2.2.1 Catches and catch composition

The fishery by PFA vessels in the Pacific is aimed at jack mackerel (*Trachrus murphyi*). Other species make up only a small fraction of the total catch, as is shown in Table 2.

year	total catch in tons	species composition in percentages			
		Trachurus murphyi	*Scomber japonicus*	*Brama australis*	other species
2009	91336	95.3	4.3	0.4	0.0
2010	34885	97.2	1.9	0.6	0.3
2011	1810	98.3	0.2	1.3	0.2

Table 2. Total catches and species composition of PFA fleet in 2009 – 2011. Based on landing data provided by ship owners and observer data (in 2010 and 2011).

A notable feature of the fishery in 2011 was the scarcity of chub mackerel (*Scomber japonicus*) in the catches. The decline of this species started already in 2010. In 2011, the second place was occupied for the first time by the Pacific bream (*Brama australis*).

2.2.2 Effort and catch per unit of effort (cpue)

The development of the cpue for jack mackerel in the PFA fleet is presented in Table 3.

year	number of fishing days	catch jack mackerel PFA fleet in tons	catch per day in tons
2005	44	6187	141
2006	109	33766	310
2007	401	123523	308
2008	423	108174	256
2009	436	91336	209
2010	274	51398	188
2011	32	1814	57

Table 3. Catch and effort in the PFA fleet. Values with for 2010 and 2011 are based on trawl station lists provided by the vessels.

The figures show the marked decline in catches and effort over the last two years. In 2010 the decline in catch per unit of effort (cpue) was still relatively small because the vessels operated only in the months with the highest catch rates (April and May). In 2011, however, even the catches in these months were extremely low.

Figure 2 illustrates the progressive shortening of the fishing season, and the concomitant decrease in cpue over the year s 2007 – 2011.

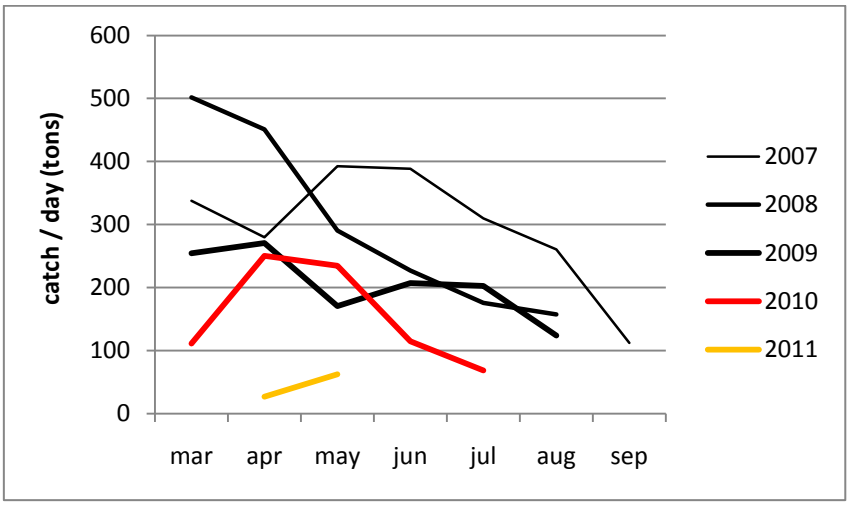

Figure 2. Monthly CPUE of jack mackerel in the PFA fleet in 2011 compared to previous years

2.3 Fisheries data collection and research activities in the PFA fleet

Two independent programs of data collection were carried out in 2010-2011: the collection of haul-by-haul information directly from the vessels, and an observer program aimed at obtaining detailed biological information on catches and discards. Both programs were organized by the Dutch consultant agency CMR. Funding was provided on an 80/20 basis by the Dutch ship owners association PFA and the Dutch Ministry of Economic Affairs, Agriculture and Innovation.

The details of these programs are briefly presented below.

2.3.1 Collection of haul-by-haul information from the vessels in the PFA fleet

Each trawler was asked to provide detailed information for each individual haul. A simple spreadsheet was used to record the requested information at sea. The information requested in this spreadsheet corresponded to the data demands of the SPRFMO Data and Information Working Group.

The size of the individual catches was estimated by visual inspection of the amount of fish in the net or in the tanks into which the catch was pumped. Normally, the captains tended to under-estimate the amount of catch at first sight. As a result, the sum of individual catches provided by the captains was lower than the landing data for the entire trip provide by the ship owner. However, no attempt was made to correct the tow-by-tow information afterwards, and the estimates for individual catches are the figures provided directly by the captains.

The tow-by tow information from individual vessels provided a good picture of the geographical distribution of the fishery. In order to show the trend in catch distribution in recent years, Figures 3a-c present the distribution of individual catches during the years 2009 - 2011. It is seen that there has been a decline in catches from 2009 to 2010, and particularly from 2010 to 2011. In the latest year, the catches were minimal, and they were restricted mainly to the month of May. The geographical distribution of catches in 2011 was limited mainly to the area between 80° - 90°W. The PFA vessels, together with a Polish vessel, searched for two weeks further to the west, but hardly any fish were detected in this area.

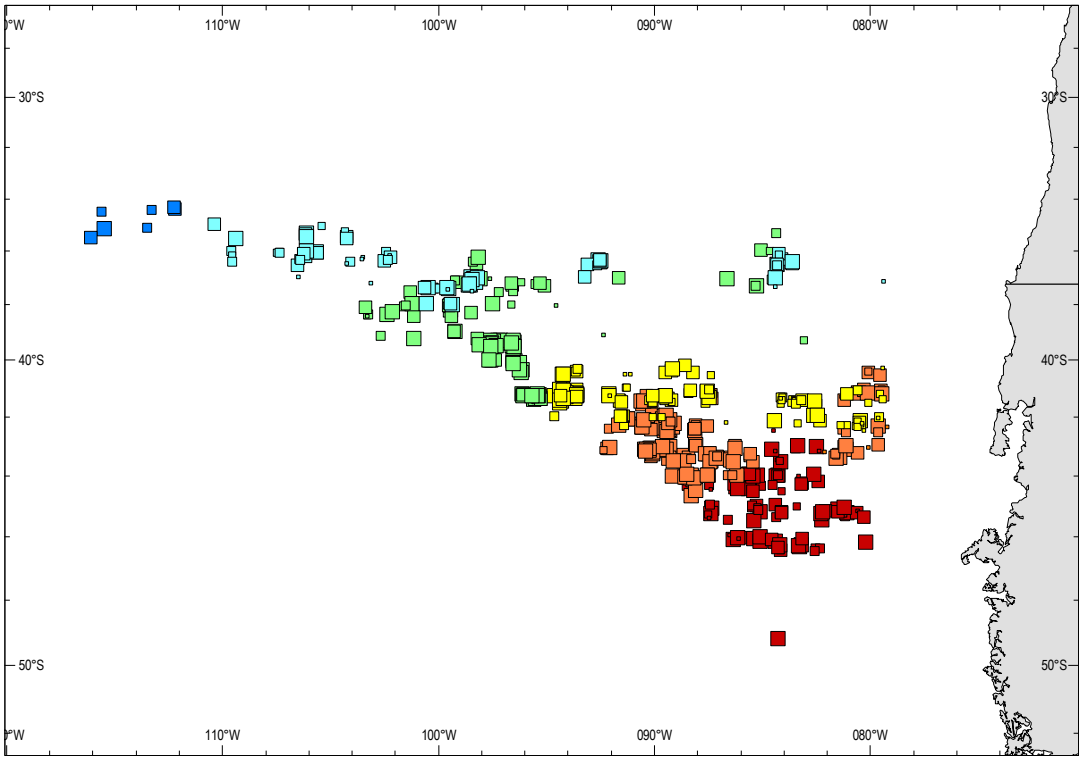

Figure 3a. Catch distribution by month of the EU fleet in **2009**. Red = April, orange = May, yellow = June, green = July, light blue = August, dark blue = September, purple = October. Size of squares is proportional to catches. Positions may be inaccurate due to errors in data transmission and analysis.

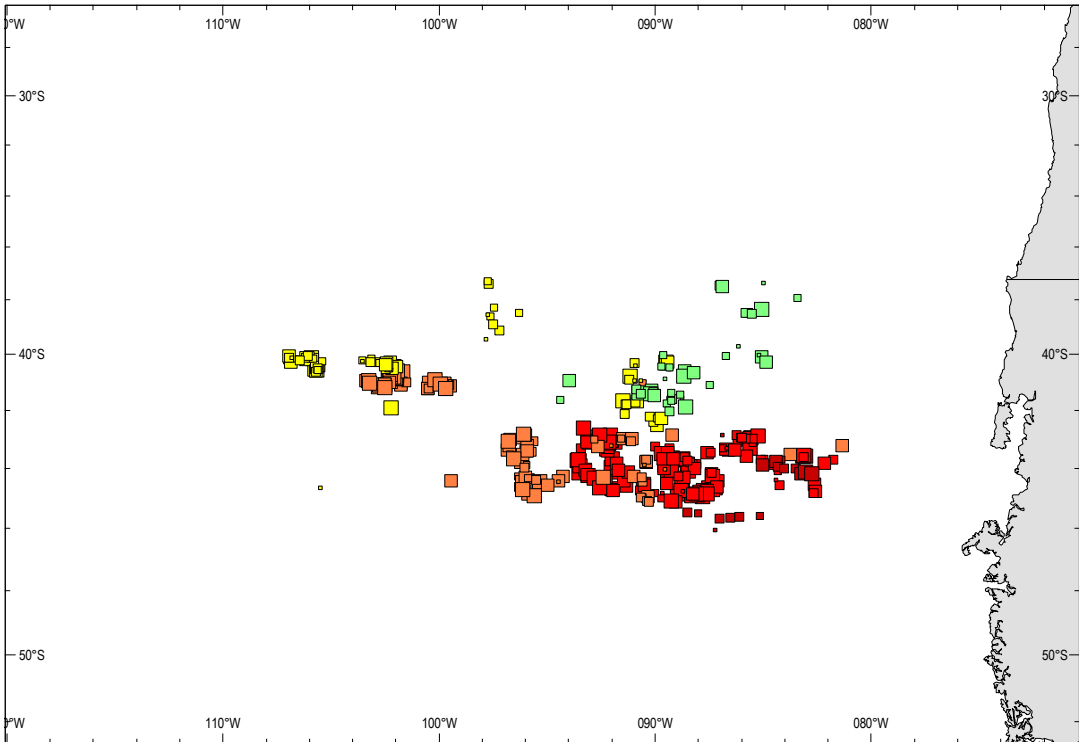

Figure 3b. Catch distribution by month of the PFA fleet in **2010**. Colour code is the same as in Figure 3a.

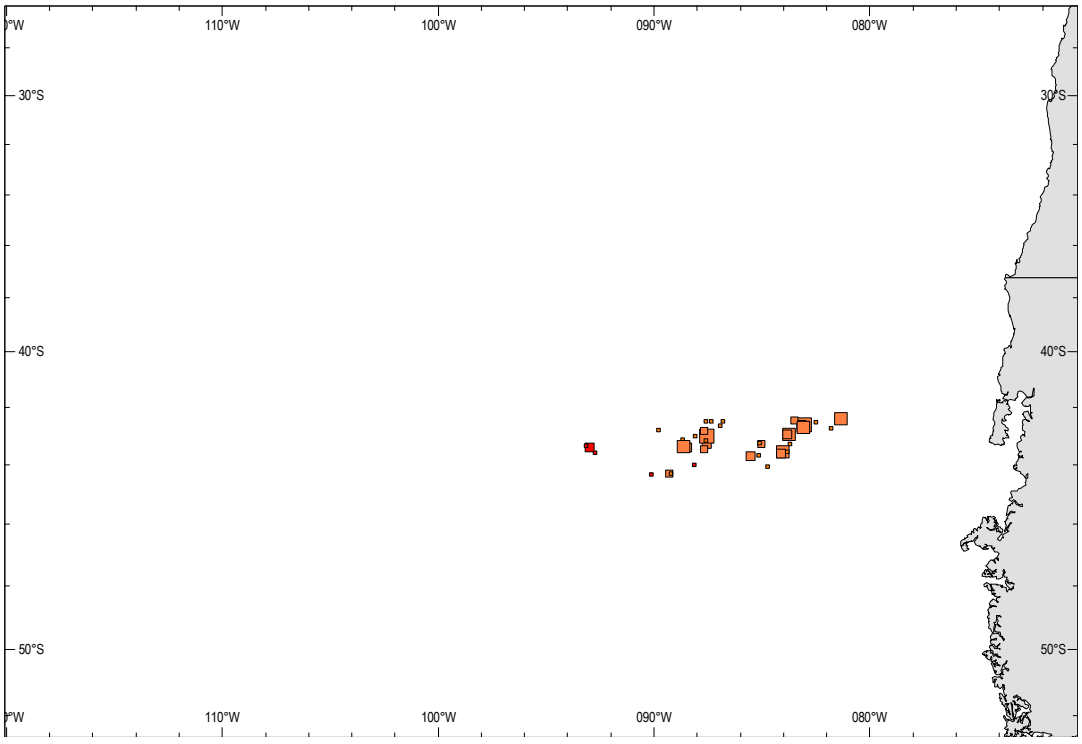

Figure 3c. Catch distribution by month of the PFA fleet in **2011**. Colour code is the same as in Figure 3a.

2.3.2 Data collection by observers on the PFA fleet

In accordance with the recommendation of the SPRFMO Data and Information Working Group, this program attempted to obtain at least 10% coverage of all hauls made by the fleet. For this purpose, two observers worked on the PFA vessels in 2010. In 2011, only two vessels operated in the Pacific, and the number of observers was reduced to one.

year	period	schip	observer	days with observations
2010	03 Apr – 21 May	KW 174 Annelies Ilena	Co de Klerk	26
	03 May – 21 May	BX 791 Jan Maria	Tomasz Raczynski	11
	14 Jun – 05 Jul	KW 174 Annelies Ilena	Tomasz Raczynski	4
	05 Jul – 28 Jul	KW 174 Annelies Ilena	Co de Klerk	9
2011	16 apr – 8 Jun	KW 174 Annelies Ilena	Co de Klerk	16

Table 4. Observer missions on PFA vessels in 2010 and 2011

The observers collected data on species composition of catches, length composition, and biological characteristics such as sex and maturity stage, food composition, stomach fullness and fat content. In addition they monitored discards and incidental by-catches of large species.

2.4 Biological sampling of catches by the PFA fleet

Biological sampling was conducted on the main species taken in the fishery. These included *Trachurus murphyi*, *Scomber japonicus* and *Brama australis*. In this report, only length data for jack mackerel (*T. murphyi*) are presented.

2.4.1 Observations on jack mackerel

The number of length measurements on jack mackerel declined over the last four years, due to the shortening of the fishing season:

year	number of jack mackerel measured
2008	28 250
2009	15 744
2010	10 540
2011	2 194

Table 5. Number of jack mackerel measured per year

Although the number of jack mackerel measured in 2011 was very low, the measurements still gave an interesting picture of the size composition of the population and the annual increase in length of the fish (Figure 4). Due to the absence of any recruitment in the seasons 2007-2009, there is a gap in the length composition of the adult population. This allows us to follow the growth of the latest

cohort that recruited to the population in 2007. Every year since then, these fish have grown approximately 2 cm in size, and they reached a modal size of 40 cm in 2011.

In 2010, a cohort of 20 cm modal length appeared in the catches. The appearance of these young fish raised hopes for a good recruitment. In 2011, probably the same cohort was encountered again, this time as fish of 27 – 29 cm modal length. However, the contribution of this cohort to the total catch was only small, indicating that it was a small year – class.

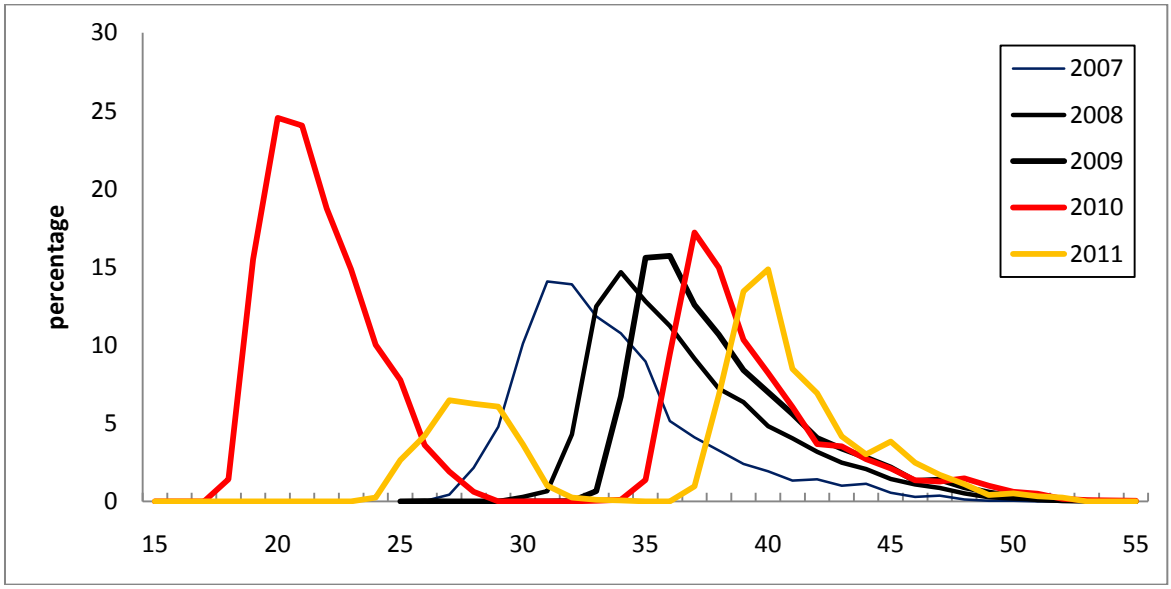

Figure 4. Percentage length composition (in numbers) of jack mackerel in the PFA catches in 2007 – 2010.

2.4.2 Observations on other species

Table 6 presents the species composition of all trawl hauls that were sampled by observers in 2010 and 2011. It is seen that the fishery is extremely mono-specific, with 97 – 98% of the catch consisting of jack mackerel. Whereas in 2010 (and in previous years) cub mackerel (*Scomber japonicus*) occupied the second place, this species was remarkably scarce in 2011. The main by-catch species in this year was the Pacific bream (*Brama australis*). The jumbo flying squid (Dosidicus gigas) was also more rare in 2011 than in earlier years, and only juvenile individuals of this species were encountered. This species is not measured by the observers as it disintegrates in the net, and only arrives in pieces on the working deck. It is not shown, therefore, in the table of catch composition.

The different species composition of the by-catches in 2011 could be an indication of a shift in ecosystem, resulting from the strong La Niña in this year. This could also be a possible explanation for the much lower than expected catches of jack mackerel in 2011.

species composition observed catches **2010**

species	weight in catch	%
Trachurus murphyi	5259248.668	97.240
Scomber japonicus	101732	1.881
Brama australis	31950	0.591
Allothunnus fallai	14158	0.262
Thrysites atun	658	0.012
Centrolophus niger	141	0.003
Xiphia gladius	120	0.002
Cubiceps baxteri	89	0.002
Schedophilus huttoni	69	0.001
Regalecus glesne	45	0.001
Tetragonurus cuvieri	47	0.001
Taractes asper	37	0.001
Lamna nasus	26	0.000
Mola mola	25	0.000
Cryptopsaras couesii	4	0.000
Taractes rubescens	3	0.000
non-identified	162	0.003

species composition observed catches **2011**

species	weight in catch	%
Trachurus murphyi	830921	98.259
Brama australis	10826	1.280
Scomber japonicus	1801	0.213
Allothunnus fallai	1598	0.189
Tilapiokaras ssp	251	0.030
Cubiceps baxteri	86	0.010
Schedophilus huttoni	61	0.007
Centrolophus niger	39	0.005
Thunnus albacares	30	0.004
Tetragonurus cuvieri	10	0.001
Taractes asper	4	< 0.001
non-identified	17	0.002

Table 6. Species composition (in kg and %) of observed catches by PFA vessels in 2010 and 2011

3 The pelagic fisheries by Poland in the South Pacific in 2010 and 2011.

3.1 Description of the fishery

Three vessels (f/v SIRIUS, f/v ALINA and f/v DALMOR II) were involved in the fishery of jack mackerel in 2010, similar like in 2009. The vessels were large pelagic trawlers, operating under the Polish flag. They used mainly the single boat pelagic trawl, but some of hauls were conducted by using pair boat midwater trawl. Fishing operations extend in the open Pacific to about 120°W. The fishing season in 2010 last from March until September 20 in the subareas 87.3.3 and 87.2.6.

In 2011, until now, only one Polish vessel was fishing for jack mackerel in this area in May. Due to very low catches the vessel left South-east Pacific fishing grounds.

3.2 Catch, effort and CPUE in the Polish fleet

Development of catch and effort of jack mackerel in the Polish fleet is presented in the text table below.

year	number of fishing days	catch jack mackerel Polish fleet in tons	catch per day in tons
2009	170	20897	121
2010	293	33112	113
2011	19	658	35

Fishing effort and catches of the Polish fleet in 2010 increased significantly compared to 2009, whereas catch per fishing day slightly decreased . Monthly catches of jack mackerel are presented in Figure 1.

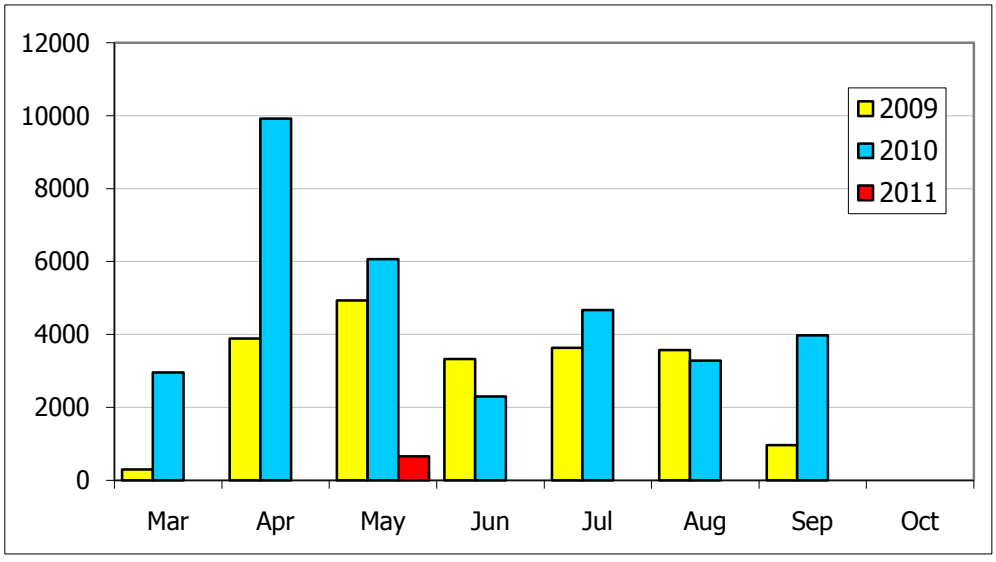

Figure 1. Monthly catches of jack mackerel by Polish vessels in 2009 - 2011

Official figures for the catches of Polish vessels in 2011 are not yet available. At the time of writing this report (August 2011) the catches were conducted only in May by one vessel. Catches and CPUE (catch per fishing day) drastically dropped compared to May 2009 and 2010. There is no signal that the Polish fishing companies are planning more fishing trips in this area in 2011. Figure 2 presents the trends of CPUE during the years 2009 – 2011.

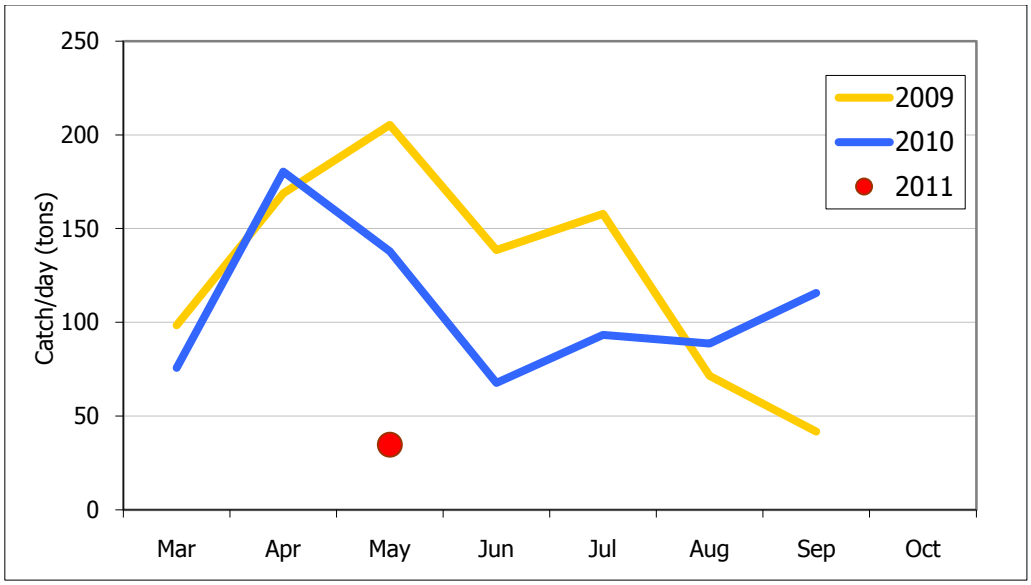

Figure 2. Monthly CPUE of jack mackerel in the Polish fleet in 2009-2011

3.3 Fisheries data collection and research activities in the Polish fleet

Two independent programmes of data collection were carried out in 2010 similar to 2009: (1) the collection of haul-by-haul information from the vessels collected by the Polish Vessel Monitoring System (VMS), and (2) an observer programme aimed at obtaining detailed biological information on catches and discards.

The details of these programmes are briefly presented below.

3.3.1 Collection of haul-by-haul information from the vessels in the Polish fleet

Each vessel fishing for jack mackerel was obliged to note in the logbook all detailed information for each individual haul, and provide them by e-mail (electronically) to the Polish Vessel Monitoring System. A simple spreadsheet of logbook was used to record the requested information at sea. The information requested in this spreadsheet do not covered all the data demands by the SPRFMO Data and Information Working Group. The additionally data (like depth of trawl) were also sent by captains to the VMS where they were converted into the required SPRFMO format and submitted these to the European Commission.

The size of the individual hauls catches was estimated by visual inspection of the amount of fish in the net or in the tanks. The haul-by haul information from individual vessels provided a good picture of the geographical distribution of the fishery. Figure 3 shows the distribution of catches during the 2009 and 2010 fishing seasons. Preliminary data of catches in 2011 are also included. Comparing the

distribution of catches during the same months of the 2009 and 2010 it can be seen that the pattern of catches distribution was not quite similar.

3.3.2 Data collection by observers on the Polish fleet

In accordance with the recommendation of the SPRFMO Data and Information Working Group, this programme attempted to obtain at least 10% coverage of all fishing days made by the fleet. For this purpose one observer was boarded on the fishing vessel. The temporal coverage in 2009 was 35 days (20.6% of fishing days). In 2010, 42 days were covered by the observer (14.3% of all fishing days) and in 2011 (until now) all 19 fishing days (100.0%) were covered by the observer.

The observers collected data on catch and species composition of catches. Biological characteristics such as length composition, weight, sex, maturity stage, stomach fullness were collected for jack mackerel and other commercially important species (Chub mackerel – *Scomber japonicus* and Pacific pomfert - *Brama japonica*). Otoliths were also collected for later age determination of fishes. In addition observers monitored discards and incidental by-catches of large species and birds.

In 2010, one scientist from the Sea Fisheries Institute in Gdynia was placed on the board of f/v ALINA for collecting the fishery and biological data according to the Polish National Programme for Collecting of Fisheries Data. The observations were carried out during 42 fishing days from March 2 to April 12, 2010 in the FAO statistical area 87.3.3. All the fishery data were recorded from the logbook and biological samples were collected. During the observations 69 hauls were performed using the single boat pelagic trawl.

During the presence of scientific observer on the board of fishing vessel the vessel caught 3 724 tons of fish. Data on catch composition showed that 99.2% of the catch consisted of Chilean jack mackerel (*Trachurus murphyi*) - 3 695 tons. Chub mackerel (*Scomber japonicus*) composed a by-catch and was processed. Discard consisted mainly of jack mackerel damaged during hauling in the net on the board of the vessel. The occurrence of other species was rather scarce and they were discarded. No marine mammals, birds or turtles were recorded by the observer. The species composition of catches during the sampling is presented in Table 1.

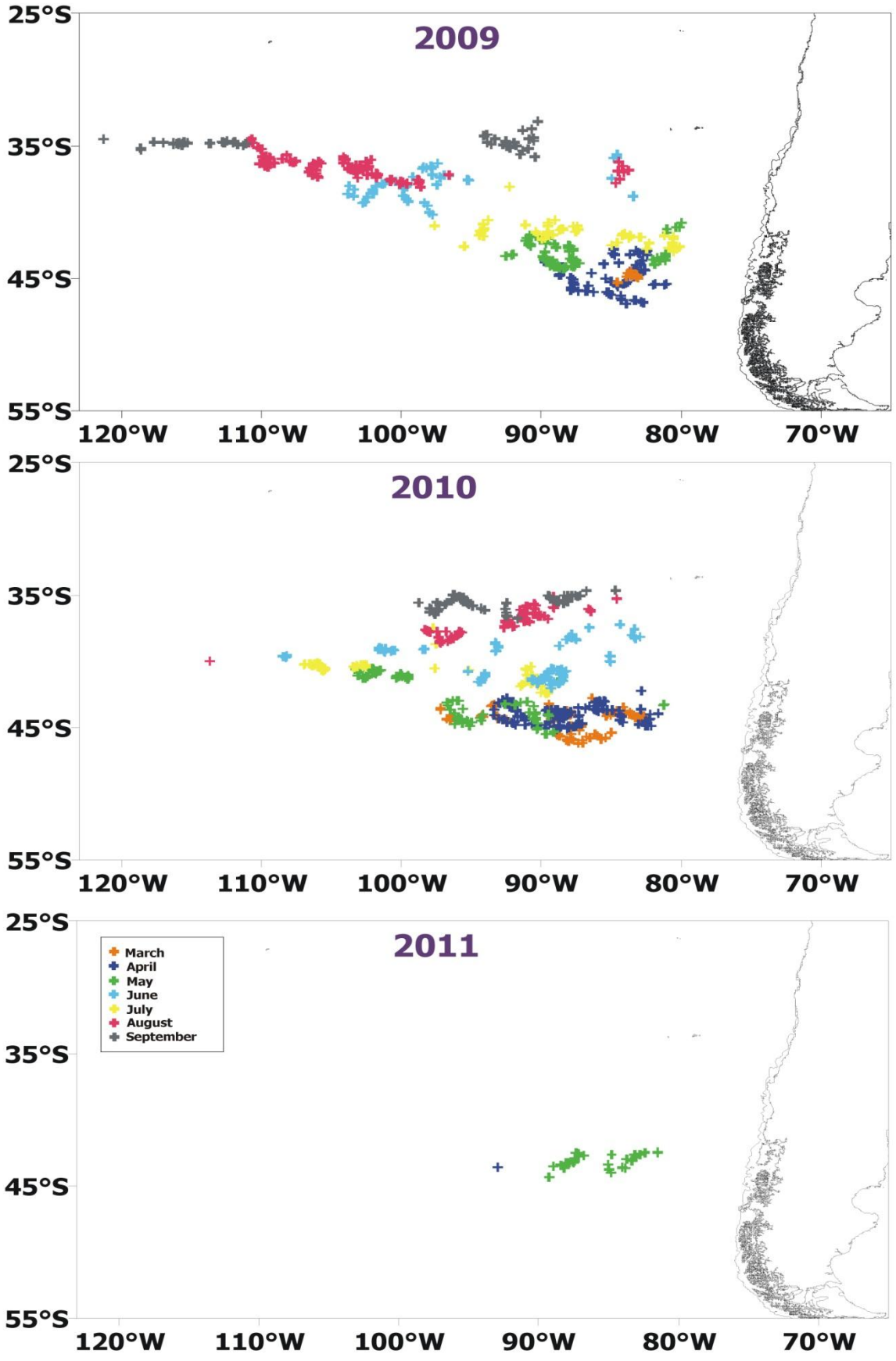

Figure 3. Catch distribution by month of the Polish fleet in 2010 - 2011

Table 1. Species composition of Polish catches collected by scientific observer during the catches of Chilean jack mackerel (March 02 – April 12, 2010).

Scientific name	Common name	Catch (kg)	(%)
Trachurus murphyi	Chilean jack mackerel	3 694 774	99.20
Scomber japonicus	Pacific mackerel	19 731	0.53
Brama japonica	Pacific pomfret	9 566	0.26
Centrolophus niger	Rudderfish	183	*/
Ommastrephes bartramii	Red flying squid	163	*/
Lamna nasus	Porbeagle shark	47	*/
Pseudopentaceros richardsoni	Pelagic armorhead	15	*/
Prionace glauca	Blue shark	14	*/
Tetragonurus cuvieri	Smalleye squaretail	13	*/
Taractes asper	Rough pomfret	8	*/
Cubiceps paradoxus	Driftfish	1	*/
	Σ =	**3 724 515**	100.00

*/ less than 0.01

3.4 Biological sampling and length/age composition of Chilean jack mackerel

A total of 6028 jack mackerel was measured in 2010, compared to 4728 fish in 2009. In 2011, the number of jack mackerel measured declined to 3107 due to the poor catches in May.

Figure 4 compares the percentage length composition of jack mackerel for the last 3 years (including 2011). It is seen that catches in 2009 – 2010 consisted only of adult fish, and that the modal length of these fish increased by about 2 cm each year. In 2010, dominated length classes were 37 and 38 cm which consisted over 44% of total. The mean length of fish in 2010 was 39.3 cm comparing 36,6 cm in 2009.

In 2011 this adult component was found again, this time with a modal length of 38-40 cm. At the same time, however, a new year-class with a modal length of 28-31 cm appeared in the catches. These were juvenile fish of presumably 3 years old. They were caught during May in the south-eastern part of the area where the catches were conducted in previous years also in May. The juveniles were found in 8 of 16 analyzed hauls.

Age composition of jack mackerel was determined on the base of otoliths collected by observers during the samples, according to the methodology used to determine the jack mackerel age in Chile (Ojeda and all – Chilean Jack Mackerel Workshop (CHJMWS pap#8), Waldorn and Kersten 2001[1] and experience of readers of the Sea Fisheries Institute in Gdynia.

In 2010, age of 697 jack mackerel was determined, comparing to 166 fish in 2009. Jack mackerel at age 7 and 8 (2008 and 2007 year classes) dominated in the catches consisted nearly 80% of total fish (Figure 5). From younger age groups only about 8% of fish at age 6 were caught and only trace of fish

[1] Waldron M.E. and Kersten M. 2001. Age validation in horse mackerel (*Trachurus trachurus*) otoliths. ICES Journal of Marine Science, 58: 806-813

at age 5. In 2009, the same year classes (2008 and 2007) of jack mackerel dominated in the catches consisted over 80% of fishes.

At the moment the age of jack mackerel caught in 2011 was not determined.

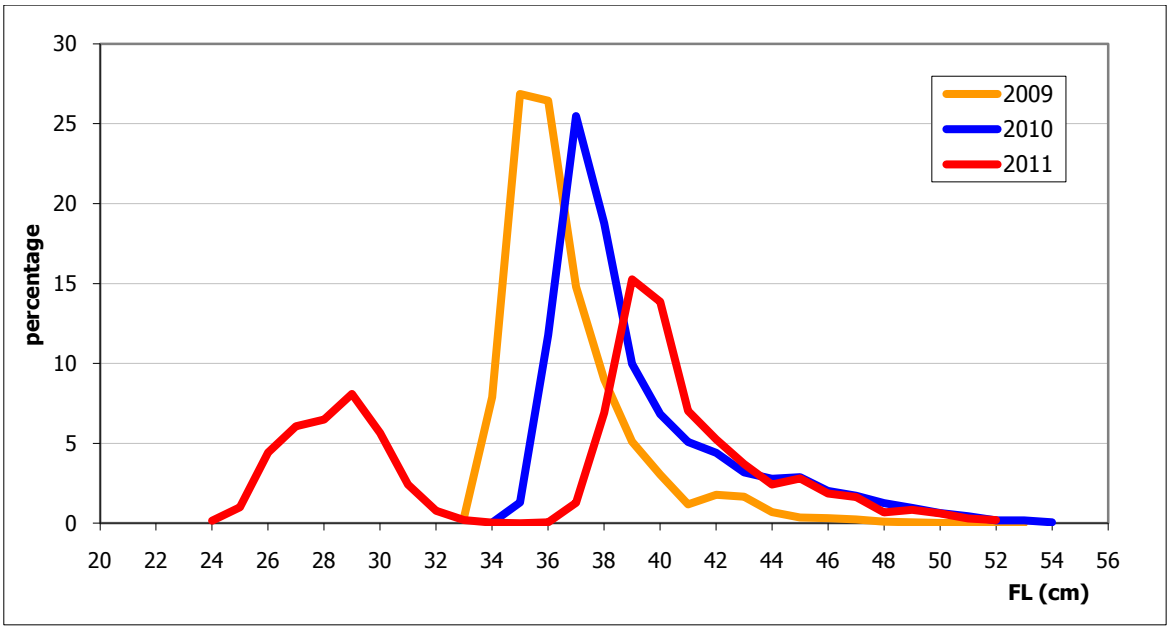

Figure 4. Percentage length composition of jack mackerel in the Polish catches in 2009-2011

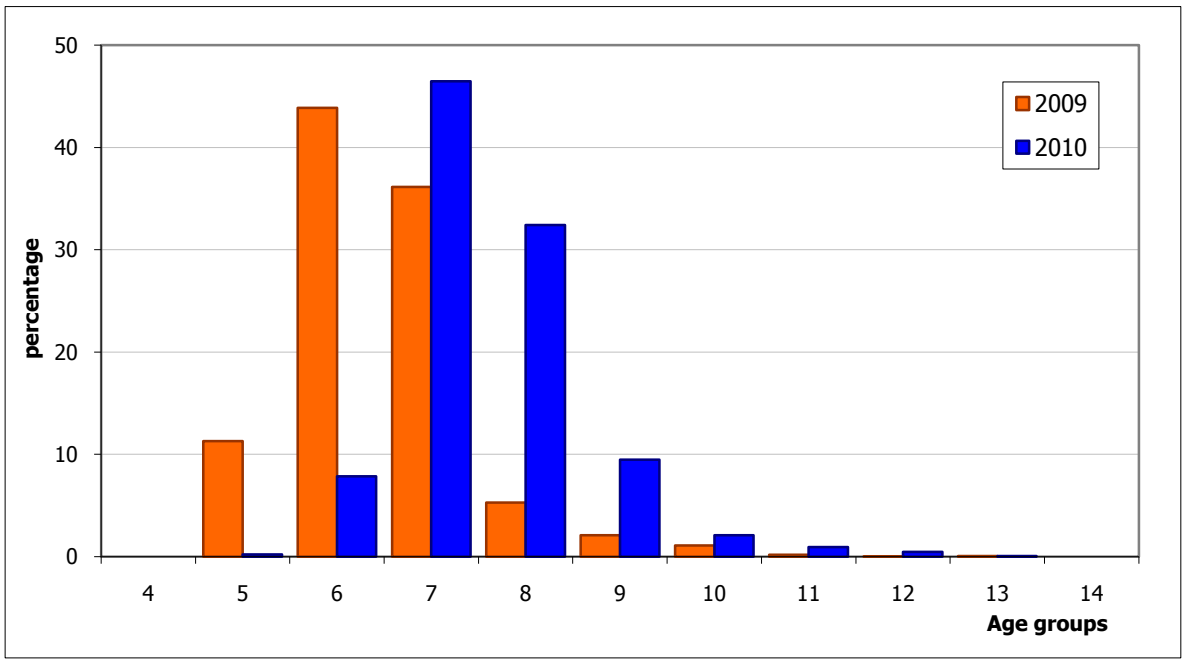

Figure 5. Age composition of jack mackerel in the Polish catches in 2009 – 2010

During the Polish sampling weight of jack mackerel at the length classes was also collected. The mean weight at length classes of Chilean jack mackerel for commercial use ranged from 500g to 1653g, and the total mean weight was 729g. (Table 2).

Table 2. Mean weight in length classes of jack mackerel during Polish catches in the period from March 10 to April 08, 2010.

Length classes (fork length) (cm)	N	Frequency (%)	Mean weight (g)
34	2	0.03	500
35	78	1.29	532
36	710	11.78	569
37	1536	25.48	606
38	1131	18.76	654
39	601	9.97	699
40	411	6.82	747
41	307	5.09	809
42	266	4.41	867
43	192	3.19	923
44	168	2.79	1003
45	174	2.89	1049
46	122	2.02	1121
47	104	1.73	1201
48	76	1.26	1264
49	58	0.96	1340
50	39	0.65	1404
51	26	0.43	1466
52	11	0.18	1473
53	11	0.18	1550
54	4	0.07	1653
55	1	0.02	?
Σ	6028	100.00	
Mean weight (g)			729

3.5 Biological sampling of other species

During fishing cruise biological data of Pacific mackerel (*Scomber japonicus*) and Pacific pomfret (*Brama japonica*) as the most numerous of bycatch species were also collected. The age of this species was not determinate yet.

3.5.1 Chub mackerel (Scomber japonicus)

Chub mackerel was observed in most of the hauls. To determine the length frequency 867 fish were measured. The length composition (total length) of adult stock shows that fish size ranged between 31 to 42 cm (figure 6) and the mean length was 38.0 cm.

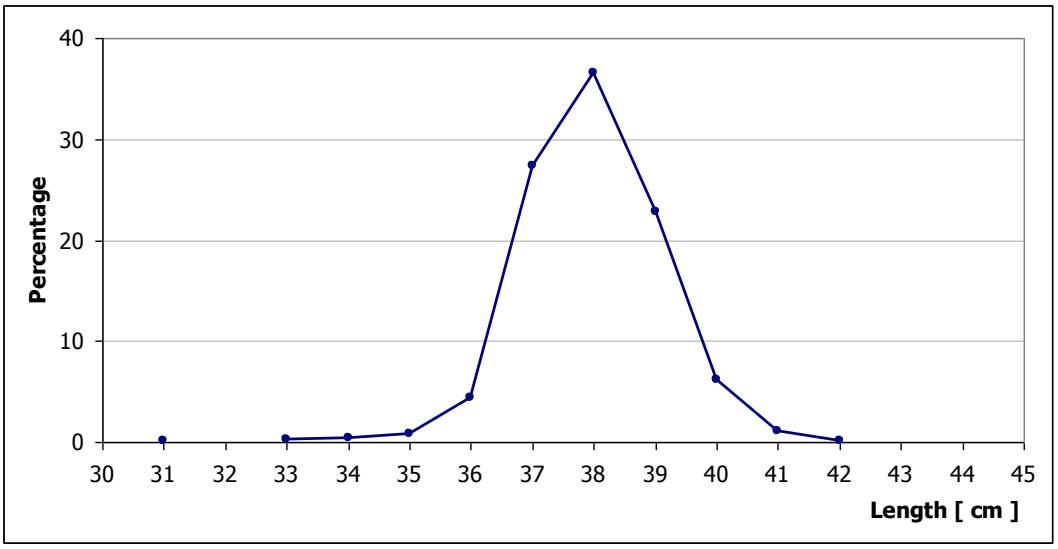

Fig. 6. Length distribution of chub mackerel caught during March/April 2010

During the sampling the weight of chub mackerel for commercial uses was in the range from 405g to 1080g, with the mean weight 831g. (Table 4).

Table 4. Mean weight of chub mackerel in length classes during Polish catches in March/April 2010

Length classes (cm)	N	Mean weight (g)
31	1	405
33	2	560
34	3	548
35	5	663
36	14	708
37	24	762
38	22	839
39	24	908
40	24	960
41	5	1004
42	1	940
Σ	125	
Mean weight		831

3.5.2 Pacific pomfret (*Brama japonica*)

Pacific pomfret was observed in about 70% of the hauls. To determine the length frequency 792 fish were measured. The length composition of adult stock shows that fish size were in the range between 33 and 54 cm, with the mean length 39.8cm (total length) (figure 8).

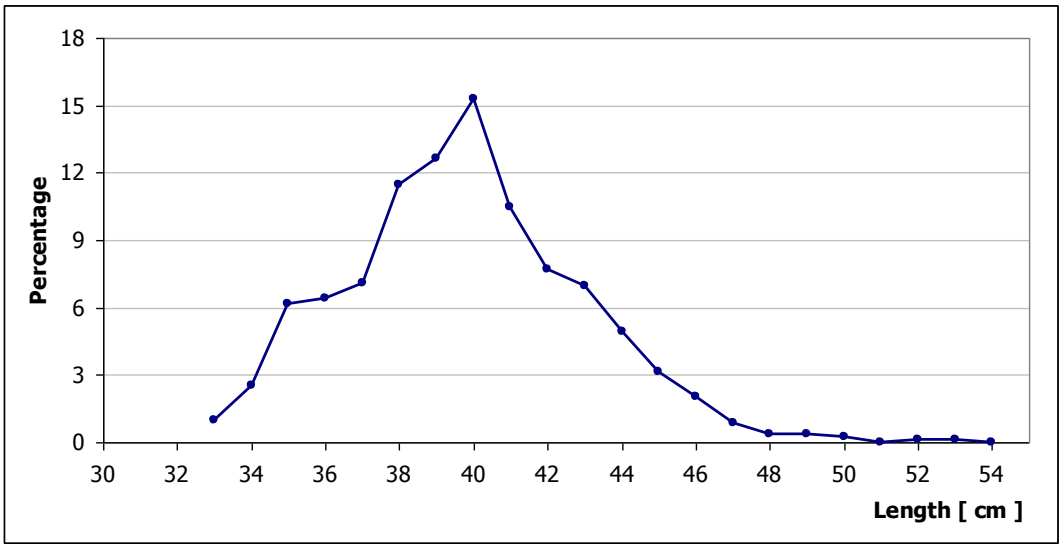

Fig. 8. Length distribution of pomfret caught during March/April 2010

During the sampling the weight of pomfret for commercial uses was in the range from 562g to 2015g, with the mean weight 1166g. (Table 5).

Table 5. Mean weight of pomfret in length classes during Polish catches in March/April 2010

Length classes (cm)	N	Mean weight (g)
33	3	562
34	8	651
35	14	688
36	17	757
37	13	862
38	21	904
39	29	985
40	42	1028
41	38	1136
42	35	1237
43	33	1365
44	22	1535
45	17	1558
46	12	1660
47	6	1733
48	3	1887
49	3	2015
Σ	320	
Mean weight		1166