



**SCIENTIFIC COMMITTEE  
EIGHTH REGULAR SESSION**

7-15 August 2012  
Busan, Republic of Korea

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**ANNUAL REPORT TO THE COMMISSION  
PART 1: INFORMATION ON FISHERIES, RESEARCH, AND STATISTICS**

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**WCPFC-SC8-AR/CCM-14**

**NEW CALEDONIA**

# WESTERN AND CENTRAL PACIFIC FISHERIES COMMISSION

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8th Scientific Committee Meeting  
7<sup>th</sup> – 15<sup>th</sup> August 2012  
Busan, Korea

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NEW CALEDONIA - ANNUAL REPORT 2011  
Part 1

## *Summary:*

Fishing for tuna and associated species by New Caledonian vessels started in 1981 with pole-and-line (less than 3 vessels) which stopped very rapidly (1981: 228 mt; 1982: 998 mt; 1983: 492 mt).

Some domestic longliners started operating at the same time and it took almost 20 years before this domestic fleet had a significant activity.

This fleet operates in the New Caledonian EEZ, and rarely fishes in the adjacent high seas.

In 2011, each of the 19 licensed domestic longliners fished in the New Caledonian EEZ. Similarly to past years there were no foreign vessels licensed or chartered to operate in the New Caledonian EEZ.

There was a 2% decrease of the total catch reported last year. This annual catch of 2,736 mt was mainly composed of albacore which is the target species of all the vessels and accounts for 63% of the total (1,736 mt compared to 1,939 in 2010). Yellowfin was second with 585 mt (22%). Marlins and swordfish remain by-catch of this fishery (76 mt and 10 tonnes respectively).

Catches of sharks have been decreasing since 2006, due to an increasing use of monofilament branchlines. Makos which are the only sharks species kept onboard to be sold on the local market (trunks), totalled 10 mt in 2011.

In 2011, port sampling and observer activities carried out under the SciFish project reached respectively 49% and 7% coverage of the longline sets. The objectives of these activities are to collect information to be checked with the other sources of data, and to provide accurate data to the stock assessments (biological samples, size composition, ...).

During all the trips observed in 2011, only one turtle interaction was observed: it was released at sea in good health. 5 birds, 2 of which were petrels, were incidentally captured.

The incidental catch of shark and ray species, which are all discarded, except makos, was reported by the New Caledonia observer programme at 514 individuals in 2011. The corresponding tonnage estimated for the species of interest (blue shark, silky shark, oceanic white tip shark, and thresher sharks) is 22 mt.

Through the ZoNéCo program New Caledonia also continues to participate in the regional efforts to improve the knowledge of tuna behaviour, in particular the South Pacific albacore as the species of major interest for its fishery.

## **Catch statistics**

As a counterpart to their licenses the New Caledonian fishing companies must provide logsheets which are collected at the end of the trips. The coverage rate of logsheets is considered as nearing 100%.

In accordance with the provision of scientific data to the Commission all the logsheets data are made available to the SPC/OFP on an annual basis. For year 2011 these data were provided for the first time in electronic format.

Effort and catch statistics in table 1 are extracted from these logsheets.

The total catch of 2,796 mt in 2011 represents a 2% decrease from the 2010 level and the second highest catch recorded since 2004.

As the target species of the New Caledonian tuna fisheries, the South Pacific albacore is the predominant species in the catch with 1,736 mt (63%). Albacore annual catch south of 20° South for 2006-2010 were 793 mt, 837 mt, 1,096 mt, 1,061 mt, and 1,404 mt respectively.

In 2011, the average weight of albacore was 17.7 kg, which is similar to the weights recorded from 2005 to 2009. With regard to yellowfin, 27.8 kg is 1.5 kg less than average weight recorded in 2010.

No New Caledonian vessel targets bigeye, sharks, marlins or swordfish. Therefore, all the catch reported for these species are bycatch. In particular, only 76 mt of striped marlin and 10 mt of swordfish were landed in 2011.

The shortfin mako is the only shark retained and sold for meat consumption in New Caledonia, totaling 10 mt per year since 2009. A new fishery regulation banning shark-fining in the EEZ has been prepared but has not been adopted by the New Caledonia government yet.

Many species show seasonal patterns in their abundance around New Caledonia which induce similar fluctuations in the catch levels reported (see table 3 and figure 3).

## **Fleet structure and fishing activity**

In 2011, 19 domestic tuna longliners were licensed to fish but only 16 of them have been active more than 9 months. Similarly to past years there were no foreign vessels licensed or chartered to operate in the New Caledonian EEZ.

Table 2 shows that 2 active vessels in 2011 are less than 50 tons. These vessels have limited cruising range. Although the larger longliners can stay at sea for two or more weeks the average trip length for the whole fleet is only 11 days of which 7 are fished.

There was no fishing activity north of the equator, nor south of 30° South.

Globally, 348 fishing trips were reported in 2011, totaling 3,825 days at sea and 2,535 days fished with 4.8 millions hooks used.

## **Monitoring activities**

Port sampling and observer activities have been carried out in New Caledonia for more than 20 years. However, they have benefited from dedicated funding only for a few years under the ProcFish and SciFish programs.

### ***Observer activity***

In 2011, 22 trips were observed by 2 observers onboard the vessels of 6 domestic companies, representing 267 days at sea and almost 12,340 fish observed. Over this period of time the observer activity covered about 7 % of all the longline sets. The detailed data are provided in table 4 in annex.

During trips observed in 2011, one turtle interaction was observed, and it was released at sea in good health. 5 birds, 2 of which were petrels, were incidentally captured.

Except makos, the incidental catch of shark and ray species, which are all discarded, was reported by the New Caledonia observer programme at 503 individuals in 2011. The corresponding tonnages estimated for the species of interest are the following:

- blue shark: 20 mt
- silky shark: 1 mt
- oceanic white tip shark: less than 1 mt
- Thresher sharks: less than 1 mt

### ***Port sampling activity***

In 2011, 172 samplings were carried out in the ports of New Caledonia totalling almost 65,230 fish (see table 5) which makes up a total of 444 889 fish sampled since early 2002.

This activity only relates to New Caledonia vessels as no unloading or transshipment involving foreign vessels, carriers and bunkers, took place in the domestic ports.

### ***Vessel Monitoring System***

New Caledonia has been operating a Vessel Monitoring System in its EEZ since early 2005.

All licensed vessels must have a transmitter on board. Due to safety regulations all of them are equipped with Inmarsat-C terminals but some vessels also have a dedicated Argos beacon on board.

A daily monitoring is carried out by the New Caledonia fisheries department, which helps:

- a. check the VMS data with the number of logsheets provided by the fishing companies
- b. the French Navy to survey the EEZ.

Since 2010 all the location data are managed under a single software which can accept various sources of VMS data and provide related statistics.

## Scientific and technical research

For many years the ZoNéCo program has been providing support to the New Caledonian longline fishery, by undertaking studies on the optimization of fishing techniques as well as the physical and biological environment of the target species of the fishery. The program initially focused on improvement of fishing techniques then turned to albacore behaviour in the EEZ around 2007, so as to enhance the sustainable management of the stock.

Previous studies were dedicated to a better understanding of the relationships between the climate signals and the dynamics of tuna stocks in the EEZ of New Caledonia. It was then demonstrated that knowledge on the tuna preys was insufficient despite their importance in the ecosystem.

Therefore, the ZoNéCo program worked together with IRD (a French research and development institute) and SPC to carry out a multidisciplinary project aiming to improve knowledge on the trophic levels and to better understand albacore behaviour in the EEZ. Several other research teams sampled, analyzed and studied the environment, preys and albacore behaviour locally as well as in the South Pacific as a whole.

In summer and winter time two scientific cruises including measures and sampling were carried out and helped characterize the intermediate trophic levels of the pelagic ecosystem which constitutes the diet of the albacore tuna. For the first time, such data could result in an estimation of the micronecton distribution. It seems that the average observed distribution in the 200 meter upper layer is consistent with the outputs of the SEAPODYM-SODA model for the EEZ of New Caledonia, with a richer area south and west of the 'Grande Terre' (main island) but weaker, north and east. Comparison between acoustic echo sounder data to measure micronecton biomass, and ADCP acoustic data have showed that using ADCP data makes it possible to estimate the vertical structure of micronecton.

Study of the albacore diet resulted in a qualitative and quantitative description of this species diet based on a spatio temporal dimension in the collected samples. The results show that albacore tuna is an opportunistic species which feeds on a large variety of preys sometimes less than 5 cm long. Compared to other tuna species albacore diet is characterized by a huge quantity of shellfish. Albacore seems to feed permanently on small quantities of preys. The reef preys are a component of this diet: their proportion varies during the year with a peak in April. It was not possible to characterize the nycthemeral feeding cycle. It seemed that albacore feeds principally within the upper layer but also visit deeper layers down to 500m. Its feeding behaviour depends on energy needs of this species, and changes around 80-85 cm of length, probably in relation to lower growth rate and sexual maturation.

Characterization of the specific horizontal and vertical migration of albacore has been studied through tagging operations carried out in New Caledonia, Tonga and New Zealand. The objective of this project was to release 30 fish tagged with miniPATs (10 tags in each EEZ). Low catch rate, bad fish condition or too small fish size resulted in only 19 fish tagged. After release, 18 of the 19 tags transmitted the data prematurely, probably because of fish death. Finally, only 10 tags provided appropriate data. The very short period covered by the available data made it impossible to undertake any relevant analysis of the horizontal movements. However, for the first time, data were obtained on vertical movements of albacore, and the preferential environment and/or temperature habitat of this species.

The analysis of a set of albacore CPUE data was made to try and understand the influence of ENSO on the dynamics of this species. This analysis showed a direct and immediate effect on CPUE which increases during El Niño and decreases during La Niña in the western Pacific (like

around New Caledonia). For the same periods of time, the effect is opposite east of the international dateline. This effect may be linked to a modification of the environment directly impacting the albacore behaviour. In the western Pacific, habitat gets close to the surface during El Niño, and expands deeper during La Niña. From the analysis it is supposed that ENSO could indirectly affect recruitment with a signal in the age class fished 4 to 10 years later.

The dynamic populations model SEAPODYM is a tool which has been developed to better understand the stock variability in the region and its future modification in the view of sustainably managing the tuna stocks. A complete work was carried out on this model through new simulations of environmental parameters, preys and albacore distribution. The model was forced by:

- 1-) observed environmental data over a short period (SEAPODYM SODA), or
- 2-) long period modeled environmental data (SEAPODYM NCEP).

The model was adjusted using catch report. The estimations of average albacore biomass in the western South Pacific are close to those obtained by the other methods (MULTIFAN). A focus on the regional trends in stocks and recruitment was made and shows a strong diminution of the stock, approximately - 40 % of the stock over the last 20 years. Every other parameter being equal (natural mortality, habitat, ...), the stock would continue to decrease over the next 20 years.

In conclusion, knowledge on albacore has greatly improved and now makes it possible to show global trends which however must be regarded with care due to uncertainties. Refinement of the SEAPODYM model seems really necessary to obtain a regional management tool of the albacore stock as reliable as possible. To reach this objective it is recommended to keep working on the migration patterns of this species, its feeding behaviour and trophic levels and toward a better understanding of the influence of all the parameters which influence the albacore behaviour. Any project built with this objective would meet the ZoNéCo program funding criteria within the 2012-2015 program work plan.

Table 1: estimates of days fished and catch by species from New Caledonian longliners in the WCPFC area

Metric tonnes of	2005	2006	2007	2008	2009	2010	2011 (*)
South Pacific Albacore	1590	1 358	1 324	1 506	1 649	1 939	1736
Yellowfin	448	414	393	424	487	505	585
Bigeye	76	35	53	62	51	44	41
Striped Marlin	74	54	63	103	71	65	76
Black Marlin	28	24	35	39	34	42	55
Blue Marlin	21	13	12	8	9	10	23
Swordfish	12	10	19	15	7	8	10
Mako shark	26	14	13	14	10	10	10
Others	197	187	210	216	228	236	260
<b>TOTAL</b>	<b>2472</b>	<b>2 109</b>	<b>2 122</b>	<b>2 387</b>	<b>2 546</b>	<b>2 859</b>	<b>2796</b>
Days fished	2836	2 134	2 531	2 751	2 674	2 541	2536

\*: preliminary data

Figure 1: historical annual catch by the New Caledonia longliners (from logsheets / CES) in the WCPFC area

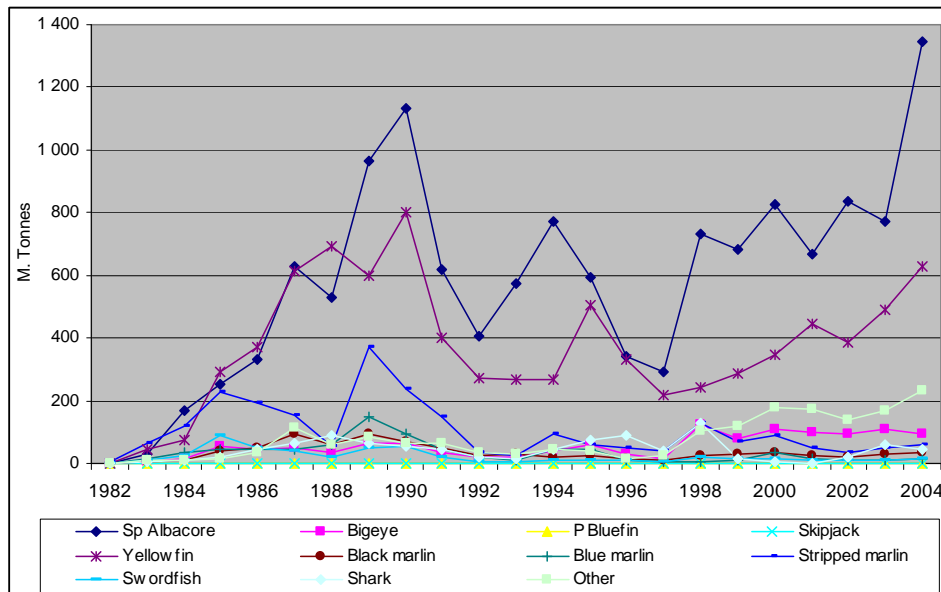


Table 2: number of domestic longliners active by GRT class

	0-50	51-200
2006	8	13
2007	8	15
2008	7	16
2009	6	15
2010	3	14
2011	2	17

Figure 2: New Caledonian longline vessels licensed

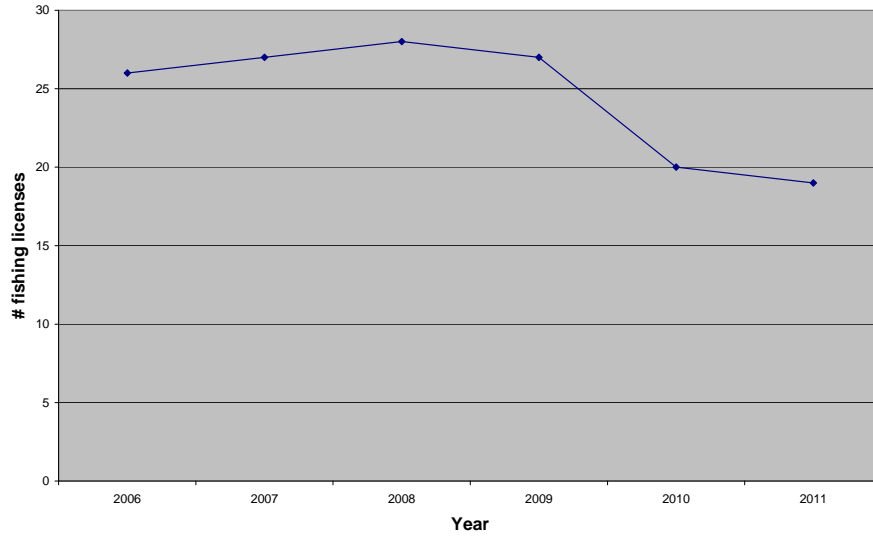


Table 3: number of fish caught per month in 2011

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
SP Albacore	6 185	4 699	4 688	4 513	6 275	6 861	8 843	11 113	9 786	11 453	10 333	13 512
Yellowfin	1 628	3 511	3 219	3 057	2 136	1 344	2 163	1 692	1 007	538	290	496
Bigeye	27	80	99	200	182	170	105	128	75	54	44	62
Striped marlin	30	22	16	43	50	58	33	74	76	128	292	327
Other marlins	69	52	79	82	83	48	87	40	56	34	73	80
Makos	10	3	8	13	7	19	21	43	38	44	47	16
Others	2 467	1 551	1 446	1 272	1 145	1 165	930	1 003	1 627	1 031	1 647	3 397
<b>Total</b>	<b>10 416</b>	<b>9 918</b>	<b>9 555</b>	<b>9 180</b>	<b>9 878</b>	<b>9 665</b>	<b>12 182</b>	<b>14 093</b>	<b>12 665</b>	<b>13 282</b>	<b>12 726</b>	<b>17 890</b>

Figure 3: yearly average weight of SP albacore and yellowfin (kg)

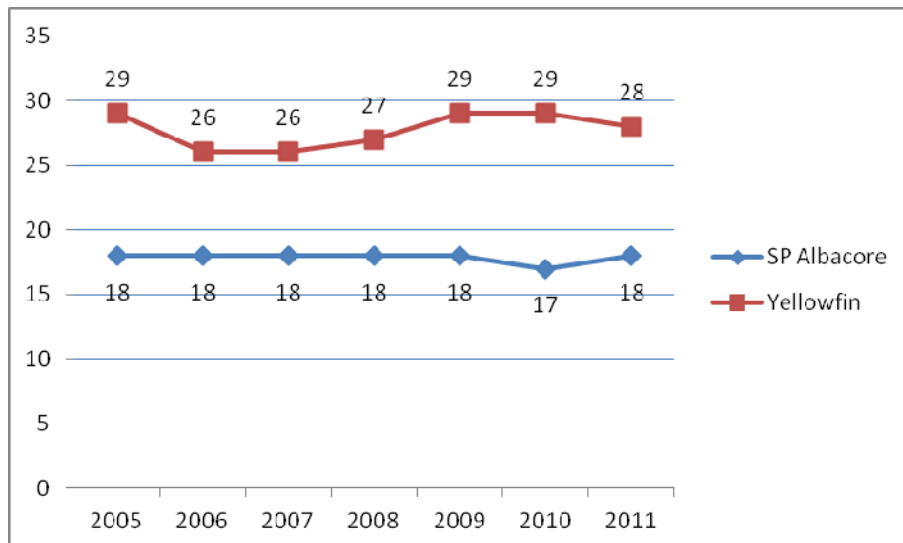




Table 4: number of observed species in 2011

Code	Species	Nb	% Observed
ALB	ALBACORE	6 172	50.02%
ALS	SILVERTIP SHARK	4	0.03%
ALX	LONGSNOUTED LANCETFISH	925	7.50%
AML	GREY REEF SHARK	15	0.12%
BAB	BLACKFIN BARRACUDA	12	0.10%
BET	BIGEYE	102	0.83%
BIZ	SEA BIRD	2	0.02%
BLM	BLACK MARLIN	28	0.23%
BRO	COPPER SHARK	10	0.08%
BRZ	POMFRETS AND OCEAN BREAMS	4	0.03%
BSH	BLUE SHARK	323	2.62%
BUM	BLUE MARLIN	32	0.26%
CCE	BULL SHARK	1	0.01%
CCP	SANDBAR SHARK	1	0.01%
DOL	MAHI MAHI / DOLPHINFISH / DORADO	923	7.48%
EBS	BRILLANT POMFRET	1	0.01%
FAL	SILKY SHARK	38	0.31%
-	FUGU	2	0.02%
GBA	GREAT BARRACUDA	176	1.43%
GEP	OTHER GEMFISH	1	0.01%
GES	SNAKE MACKEREL	24	0.19%
LAG	OPAH (MOONFISH)	88	0.71%
LEC	ESCOLAR	58	0.47%
MLS	STRIPED MARLIN	63	0.51%
OCS	OCEANIC WHITETIP SHARK	7	0.06%
OIL	OILFISH	1	0.01%
PLS	PELAGIC STING-RAY	83	0.67%
-	PILOT FISH	1	0.01%
PRX	SEA BIRD	2	0.02%
PTH	PELAGIC THRESHER	9	0.07%
SBF	BLUE FIN TUNA	1	0.01%
SFA	SAILFISH (INDO-PACIFIC)	11	0.09%
SHK	OTHER SHARKS	17	0.14%
SKJ	SKIPJACK	381	3.09%
SMA	SHORT FINNED MAKO	29	0.24%
SSP	SHORT-BILLED SPEARFISH	49	0.40%
SWO	SWORDFISH	18	0.15%
TIG	TIGER SHARK	4	0.03%
WAH	WAHOO	221	1.79%
YFT	YELLOWFIN	2 470	20.02%
TTH	TURTLE	1	0.01%
RZV	SLENDER SUNFISH	13	0.11%
GML	ROYAL GRAMMA	1	0.01%
NEN	BLACK GEMFIH	1	0.01%
LOP	CRESTFISH/UNICORNFISH	2	0.02%
LMA	LONGFIN MAKO	3	0.02%
SXH	BLACK MACKEREL	1	0.01%
GEM	SYLVER GEMFISH	1	0.01%
ALO	SHORTSNOUTED LANCETFISH	2	0.02%
BTH	BIGEYE THRESHER	1	0.01%
ALV	COMMON THRESHER	1	0.01%
POA	ATLANTIC POMFRETS	1	0.01%
DKN	SEA BIRD	1	0.01%
GSE	GOLDENSTRIPED SOAPFISH	1	0.01%
Total		12 339	100.00%

Figure 4: breakdown of shark and ray species recorded by observers in 2011

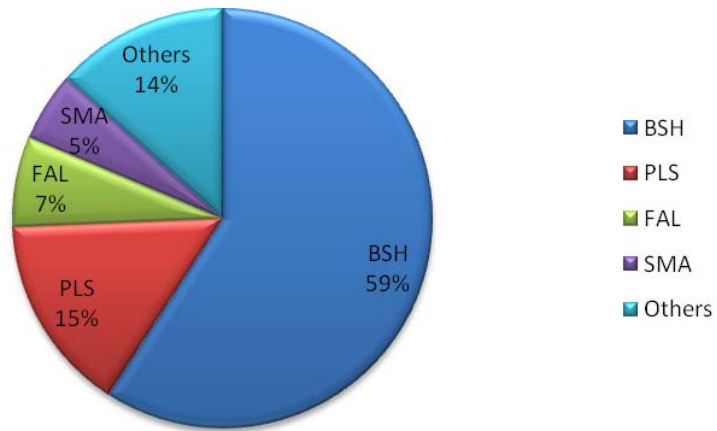


Table 5: number of fish sampled in 2011, by species

Species	Tuna			Billfishes					
	ALB	YFT	BET	MLS	SSP	BLM	BUM	SWO	SFA
<b>Number of fish sampled</b>	45 624	11 216	468	430	437	200	92	50	90

Species	Other commercial species				
	DOL	WAH	LAG	SMA	BRZ
<b>Number of fish sampled</b>	4264	1356	894	91	13

Figure 5: composition of port samples in 2011

