Biological Sampling Newsletter

for Observers and Port Samplers

SPC-OFP Ecosystem Monitoring and Analysis Section*

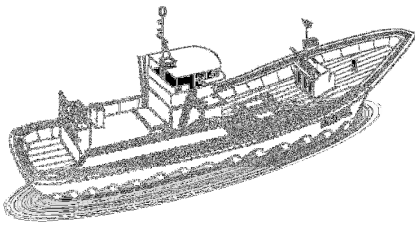
Issue #12 — 15 October 2009

Welcome

to the 12th issue of the *Biological Sampling Newsletter*, which provides news about the Ecosystem Monitoring and Analysis Section of the Secretariat of the Pacific Community's (SPC) Oceanic Fisheries Programme (OFP).

In this issue we introduce our new staff member and present updates on the tagging project, with a reports on the last cruise, the albacore biology project and the stomach sampling programme. Crocodile shark, an increasingly seen species, is arousing interest and more knowledge about this small shark is required.

Hope you enjoy this issue!



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Contacts: Valérie Allain (valeriea@spc.int) and Caroline Sanchez (carolines@spc.int).

LAB STAFF

In September, we had the pleasure of welcoming our new laboratory assistant Malo Hosken.

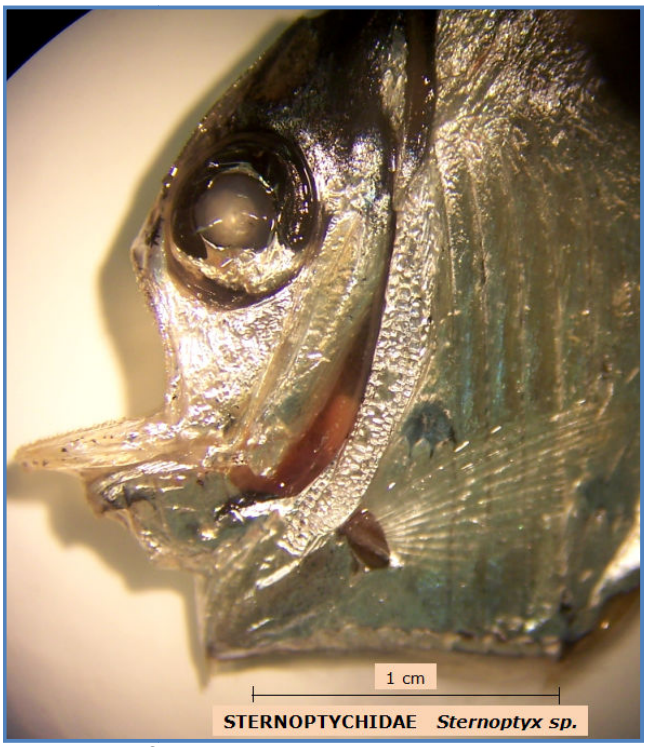
Malo recently returned to New Caledonia, his home country, after spending 7 years in Australia in Brisbane and Townsville. During this time he completed a Bachelor of Science in marine biology and a Master of Applied Science in natural resource management. He also worked in the world's largest coral reef aquarium ReefHQ as well as for Reef Check Australia.

Malo has previous experience in taxonomy work with seabird stomach contents and fossil corals. He is very thorough in the laboratory and has a great interest in identifying prey. Currently his main work is examining the stomach contents of the samples you have been sending us.

Malo and Cyndie are working together to examine the samples collected by observers and during tagging cruises. You will have the opportunity to meet them during the meetings to be held in Nouméa.

Malo Hosken, new laboratory assistant

Contacts: cyndied@spc.int and maloh@spc.int



Hatchetfish found in the stomach of a pelagic predator, examined under the microscope.

PACIFIC TUNA TAGGING PROGRAMME (PTTP): WP3 TAGGING CRUISE

Western Pacific Cruise 3 (WP2) was designed as a three-month cruise to undertake tagging operations in the exclusive economic zones (EEZs) of Papua New Guinea (PNG), Federated States of Micronesia, Indonesia and Nauru (Figure 1). It began on 13 July and ended on 14 October 2009.

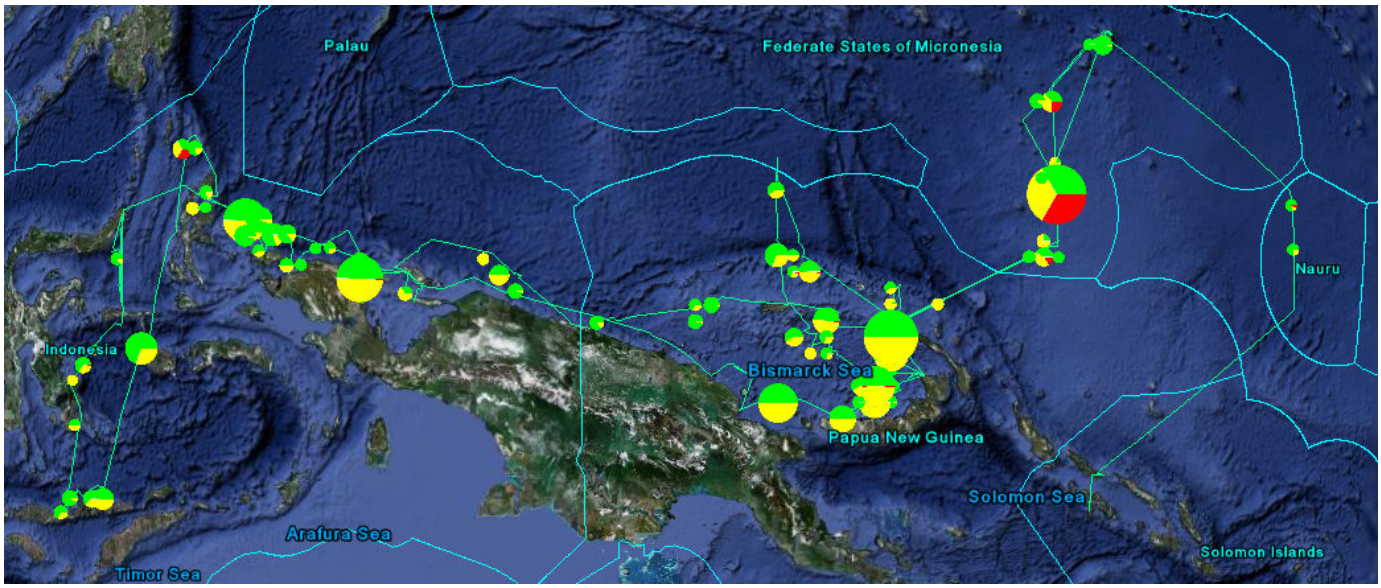


Figure 1. WP3 cruise track and tag releases (green – skipjack, yellow – yellowfin and red – bigeye).

During WP3 tagging, a total of 28,217 tuna were tagged with conventional tags and 58 with archival tags. Of the 28,217 conventional tags, 83% were inserted in skipjack, 15% in yellowfin and 2% in bigeye tuna. Most of the tagged fish were caught under anchored fish aggregating devices (FADs), in association with seamounts, in free schools or under floating logs (Table 1).
A total of 12 yellowfin, 1 bigeye and 45 skipjack were tagged with archival tags.

The tagging vessel Soltai 105 at port in Indonesia during WP3.

Table 1. Number of conventional tags released per species and school type during WP3.

	Releases of			
School association	**BET**	**SKJ**	**YFT**	**TOTAL**
Unassociated / Free school	2	3165	154	**3321**
Log	8	1976	198	**2182**
Anchored FAD	486	17122	3791	**21399**
Drifting FAD				
Seamount		1241	73	**1314**
Island or reef			1	**1**
TOTAL CRUISE	**496**	**23504**	**4217**	**28217**

Along with the tagging activities, our team is taking the opportunity to collect biological samples to complement the samples gathered by observers. We collected 167 stomach (Table 2), muscle and liver samples for the trophic structure study during WP3. We also used a fat meter to measure the fat content of 229 fish (139 skipjack, 85 yellowfin and 5 bigeye) to estimate their trophic status.

Table 2. Number of stomachs and fat meter data collected per species and school type during WP3.

	Skipjack		Yellowfin		Bigeye	
	Stomach	Fat meter	Stomach	Fat meter	Stomach	Fat meter
Free school		13				
Drifting FAD	30	30	8	8		
Anchored FAD	45	81	51	63	16	
TAO buoy	15	15	2	14		5
Total	**90**	**139**	**61**	**85**	**16**	**5**

Overall Pacific Tuna Tagging Project:

- After the WP3 cruise, the total number of tags released under PTTP reached 252,147 for the period August 2006 to October 2009 (Table 3)

- At 15 October 2009 the total number of recoveries was 26,595, about 10% of released tags (Table 3)

- Regular updates on PTTP tag numbers and maps are available on the SPC-OFP website at http://www.spc.int/oceanfish/.

Indonesian pole-and-line vessel looking for tunas

Table 3. Number of tags released and recovered, and percentage of recoveries for the overall Pacific Tuna Tagging Project (PTTP), for the period August 2006–October 2009.

	Releases	Recoveries	% recoveries
Skipjack	164,581	16,413	9.97%
Yellowfin	77,024	8,840	11.47%
Bigeye	10,542	1,342	12.73%
Total	252,147	26,595	10.54%

CROCODILE SHARK WANTED:

Crocodile shark *Pseudocarcharias kamoharai* (FAO code **PSK**) is a mid-sized oceanic shark recorded worldwide in tropical oceans. It was considered as a rare species last century, but encounters with it have increased in recent years in the longline fishery.

The principal goal of the sampling programme is to obtain biological information to better understand the biology and role in the pelagic ecosystem of this poorly studied species, which is probably one of the emerging mid-sized predators in the pelagic environment.

1. Identification.

The crocodile shark is easy to identify. However, caution is needed since it is often confused with *Odontaspis noronhai* or *Scymnodon obscures*.

Specific external identification features are: large eyes, low first dorsal fin, small pectoral fin, small-medium size (< TL 131 cm), awl-like teeth with no cusplets (mako-type) (Fig. 2). If the individual is larger than 130 cm TL, please check the species again.

Figure 2. The crocodile shark, *Pseudocarcharias kamoharai* (FAO code PSK)

2. Sampling

All the information on the fishing operation and the fish should be recorded carefully, as for every fish. Record it in your observer diary.

If conditions **permit,** simply put all the individuals caught in the freezer with T°C = -12-18°C. Label every sampled fish with:

- Name of the vessel and cruise number (cruise code)
- Reference of fishing set (set number)
- Date
- Reference number of fish in the set.
- Fork length

Be careful when sampling this species! The crocodile shark is small but has sharp teeth and a strong bite.

According to your data, in recent years, crocodile sharks have been observed in Australia, Fiji, Federated States of Micronesia, Marshall Islands, Papua New Guinea and Cook Islands.

PLEASE INFORM YOUR COORDINATOR AND VALERIE ALLAIN (VALERIEA@SPC.INT) OF ANY SIGHTING OR SAMPLING OF CROCODILE SHARK.

ALBACORE BIOLOGY PROJECT - UPDATE:

The overall objective of the Albacore Biology Project is to obtain a better understanding of the biology and population dynamics of albacore in the Western and Central Pacific Ocean (WCPO). Specifically, the project aims to provide reliable estimates of age, growth, maturity, fecundity and spawning fraction to incorporate into models used to assess the status of albacore stocks.

To achieve these objectives, we need to collect a large number of biological samples, mainly otoliths and gonads as shown in Figure , across a wide area to examine how the population dynamics of albacore vary across the WCPO.

Figure 3. Albacore gonad and otoliths

It is anticipated that samples will be collected from at least 100 albacore in each of the 25 cells of the grid shown in Figure 4, providing samples from a total of over 2500 albacore.

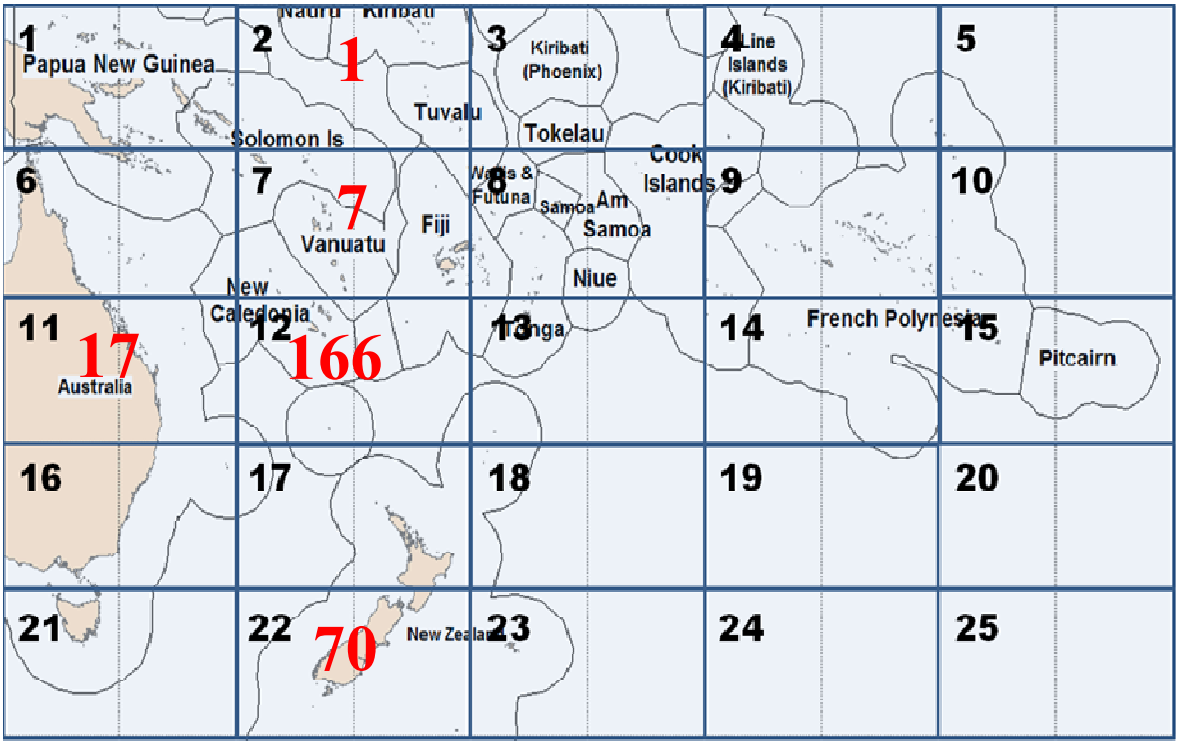


Figure 4. Sample areas (numbered in black) for the collection of albacore biological samples across the Western South Pacific Ocean. Red numbers indicate number of samples collected so far.

A number of observers learnt how to extract otoliths and gonads during recent SPC observer training workshops. These observers are now collecting samples during longline fishing trips. More observers will be trained during future SPC observer training workshops in Fiji and Papua New Guinea in 2009 and other countries in 2010.

To date, samples have been collected from 261 albacore in only 5 of the 25 areas (Figure 4). Most of these were collected by a single observer in New Caledonia. We still have a long way to go to reach our target, so we encourage observers to continue collecting samples, particularly in areas for which we have no samples to date. CSIRO in Australia is providing samples from Australia's east coast, **but we urgently need samples from fisheries in Vanuatu, Fiji, Samoa, Tonga, Cook Islands and French Polynesia**.

Biological sampling during observer training workshop in Vanuatu.

The samples that have been collected so far are from a wide size range of albacore (Figure). As expected, smaller albacore were sampled from the cooler waters around New Zealand (Area 22), with larger adult fish in the more tropical areas. It will be important to continue to collect samples from a wide size range. This will help us to more accurately estimate growth rates for albacore and to determine the size and age at which albacore mature.

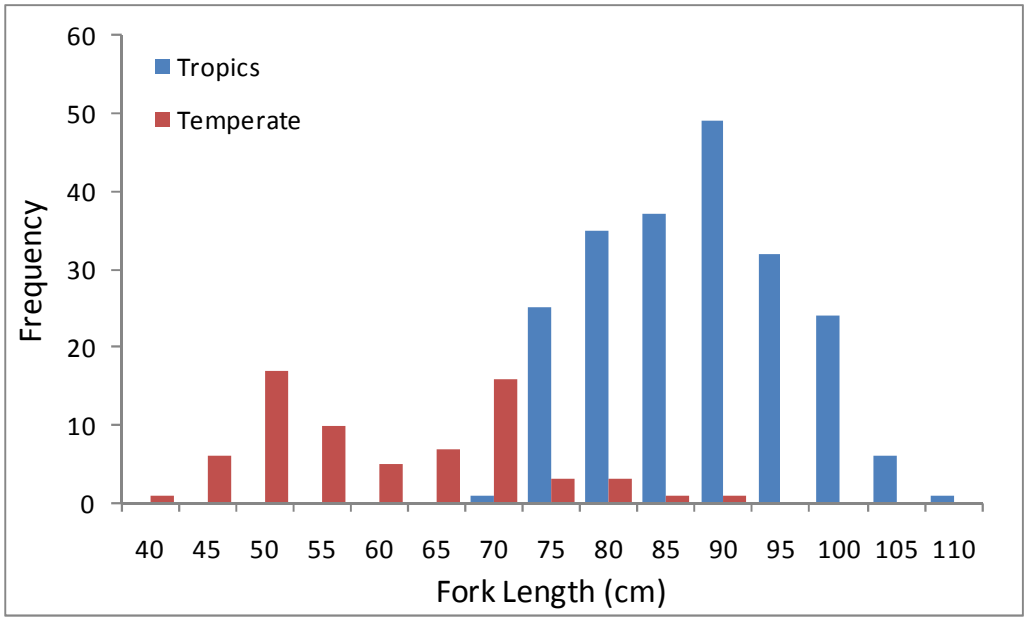


Figure 5. Length distribution of albacore sampled in tropical and temperate waters.

STOMACH SAMPLING:

Since the beginning of the project in 2001, stomach sampling has been conducted with great success by the region's observers. Since 2006, the tagging operations led by SPC and collaboration with observer programmes have allowed us to increase the number of samples obtained and to expand the geographic coverage using a pole-and-line vessel (Figure).

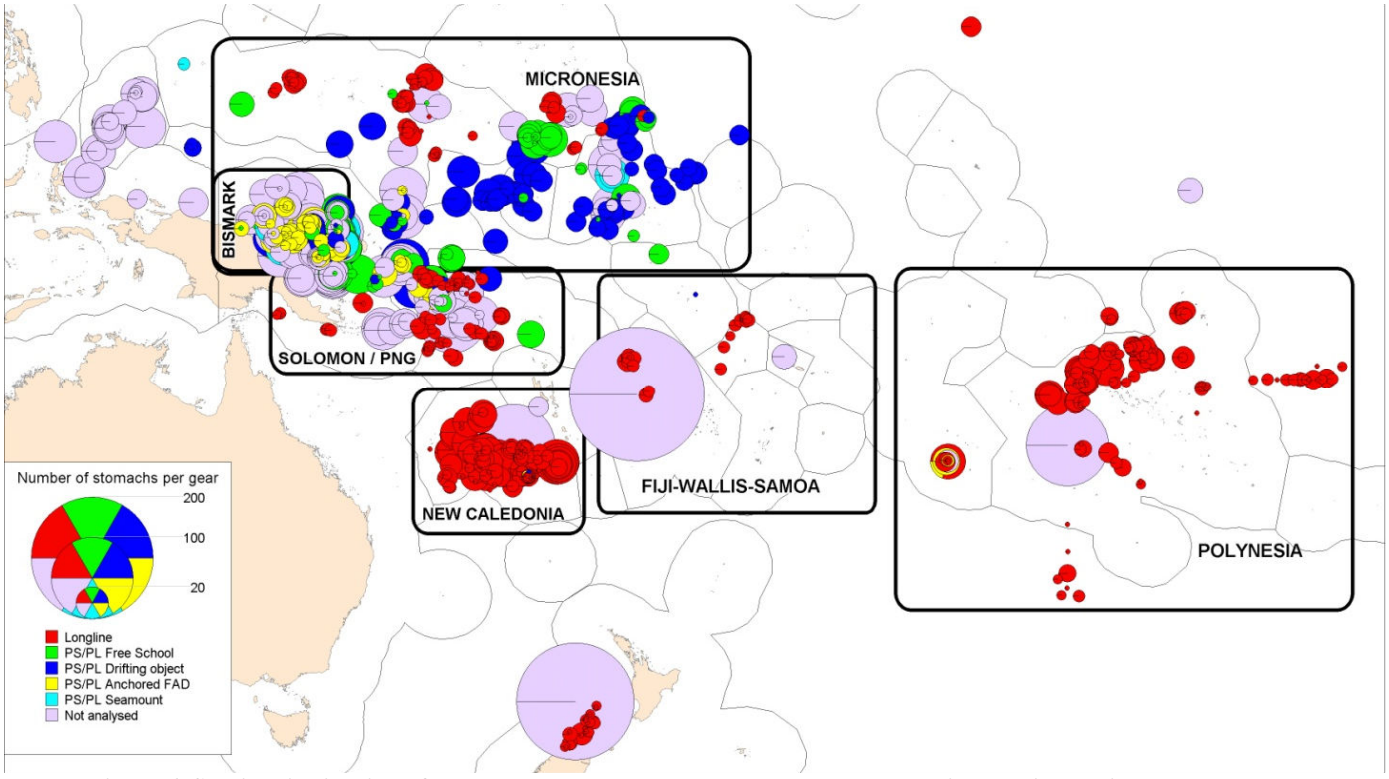


Figure 6. Spatial distribution of stomach samples collected by observers and during tagging cruises. The number of stomach samples examined in the lab is color-coded according to the sampling gear used; stomachs not yet analysed are indicated in purple.

The following graphs (Figures 7–13) present an update of the number of stomach samples collected by observers only; samples from tagging cruises are not considered here. The data presented relate to the number of stomachs examined by our team in the lab and only include non-empty stomachs that actually provide information on predators' diets. Where applicable, we have added the number of stomachs you have collected but that still need to be examined in the lab (this number may include empty stomachs).

The sampling target is to examine 100 non-empty stomachs per species, area and gear. Although this target has been reached for a number of species in some areas, more sampling is required as outlined in the figures below.

Thank you for your support in continuing to collect samples to help us fill in the gaps in our research.

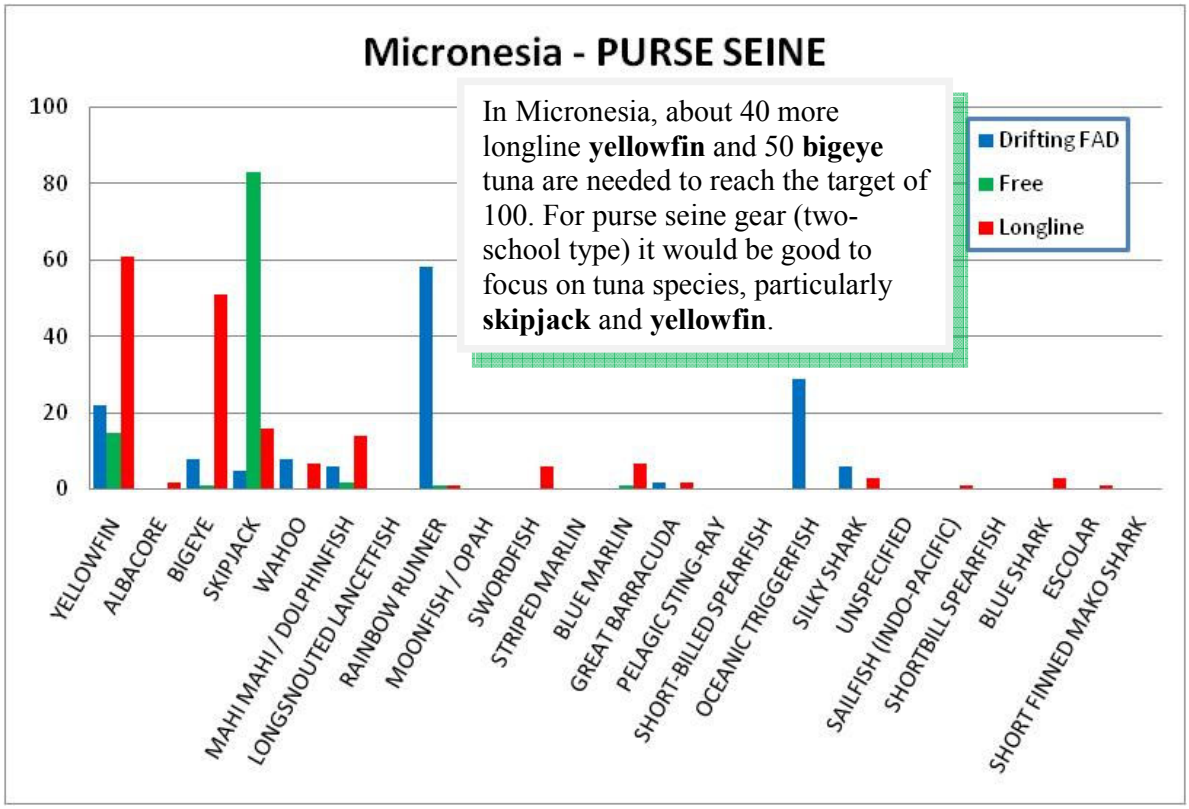


Figure 7. Number of stomachs collected and examined for the Micronesian area (longline and purse seine gear, two school type).

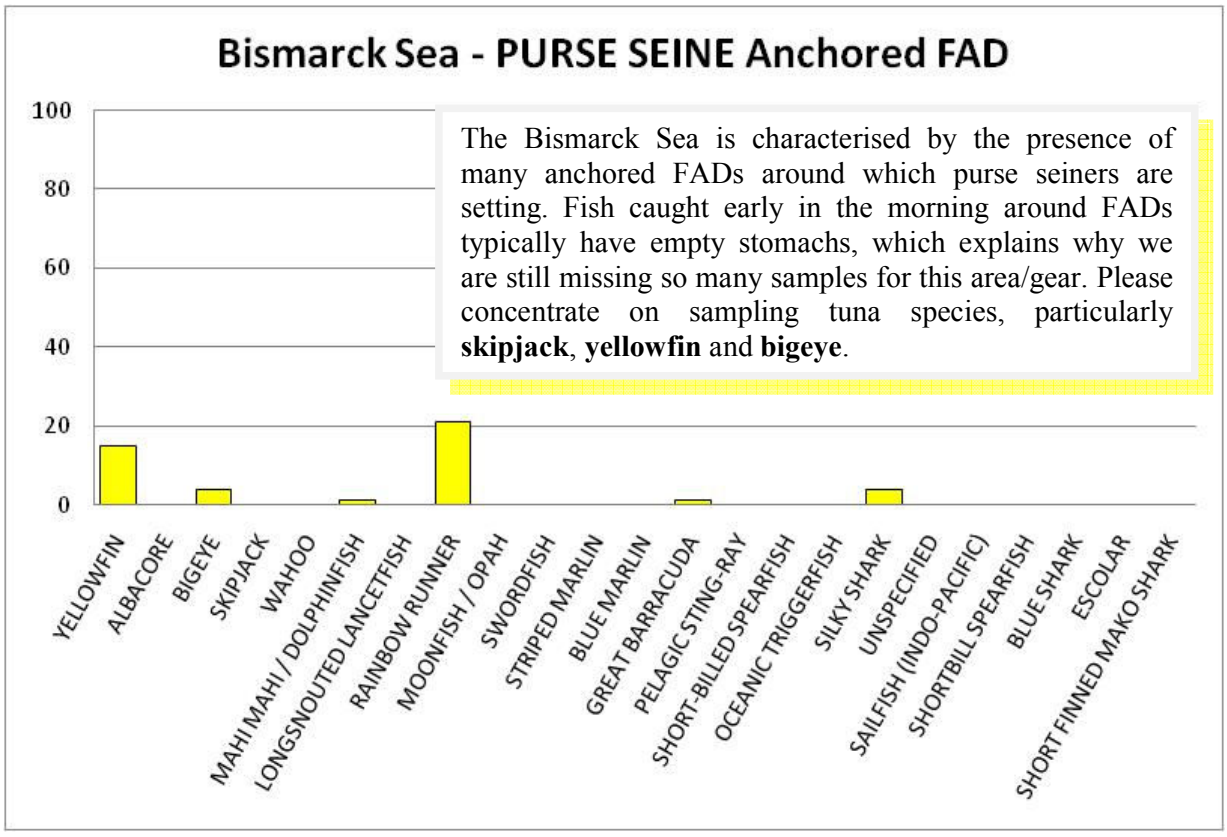


Figure 8. Number of stomachs collected and examined for the Bismarck Sea in PNG (purse seine gear around anchored FADs).

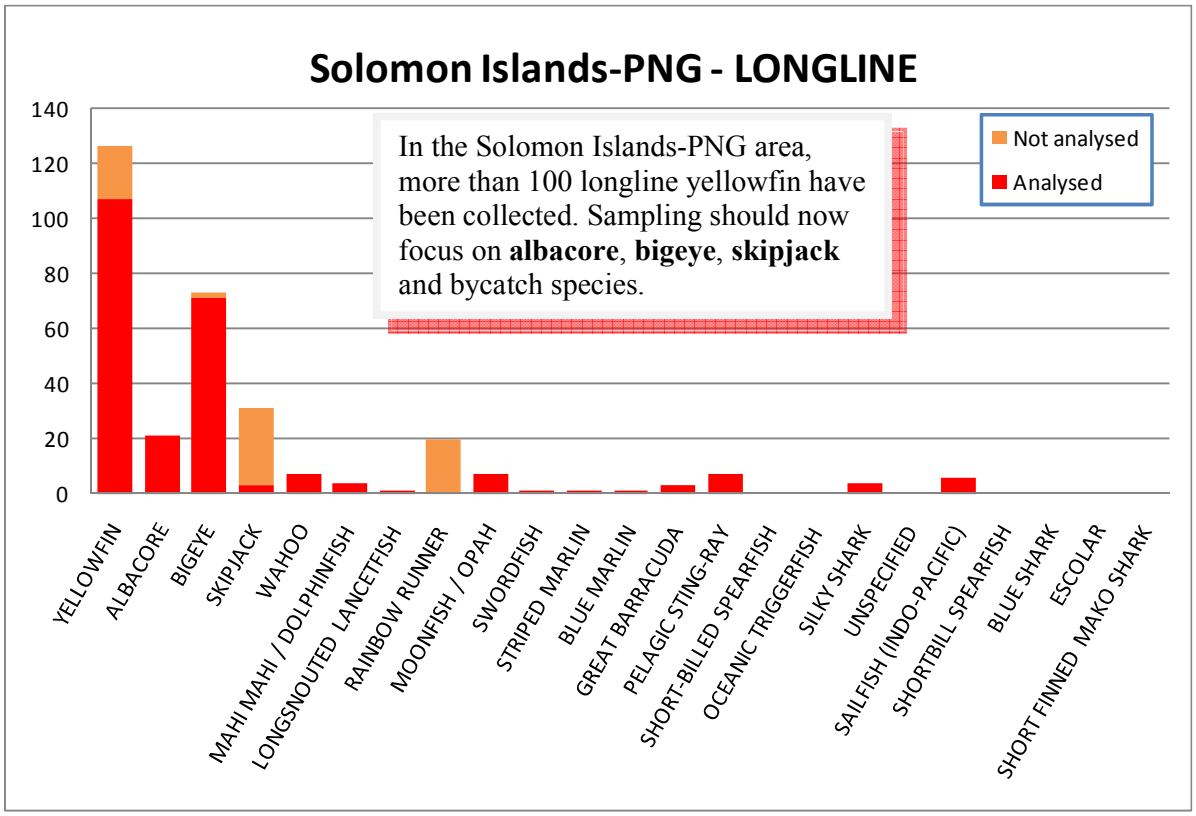


Figure 9. Number of stomachs collected and analysed/not analysed for the Solomon Islands-PNG area (longline).

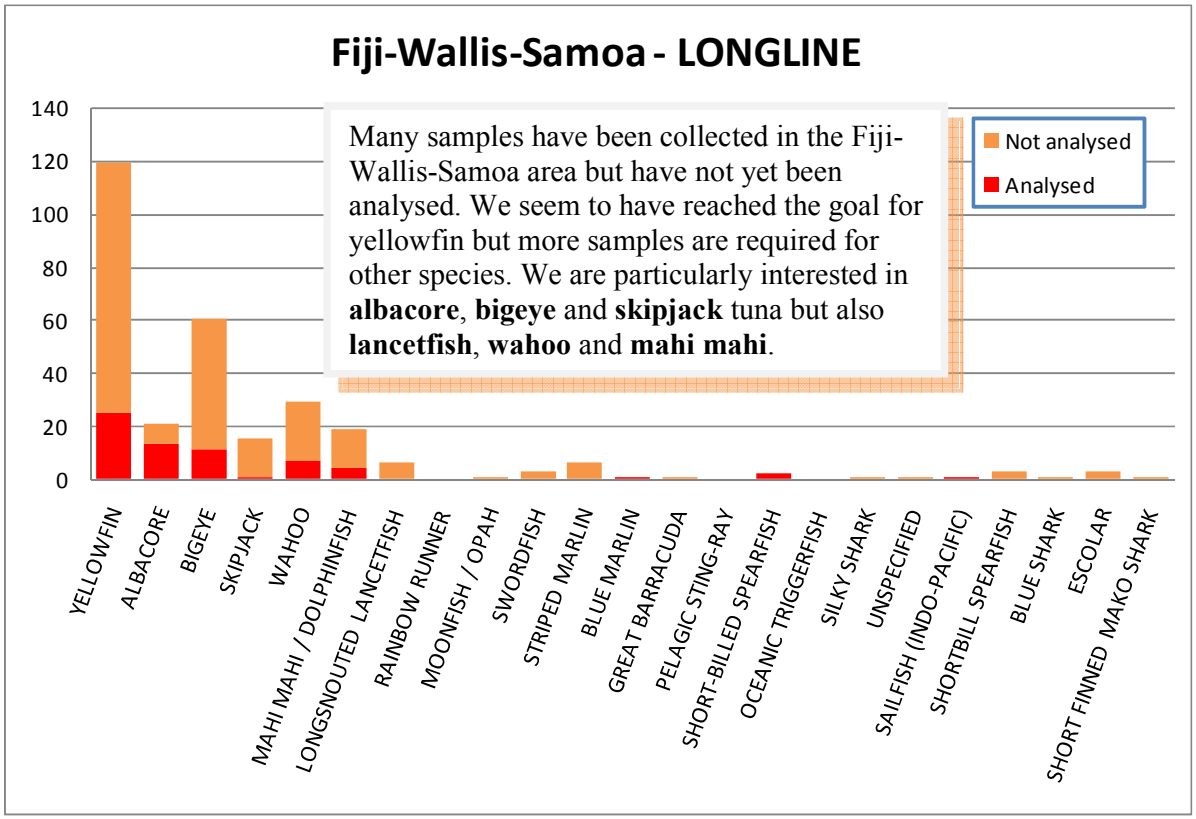


Figure 10. Number of stomachs collected, analysed/not analysed for Fiji-Wallis-Samoa area (longline).

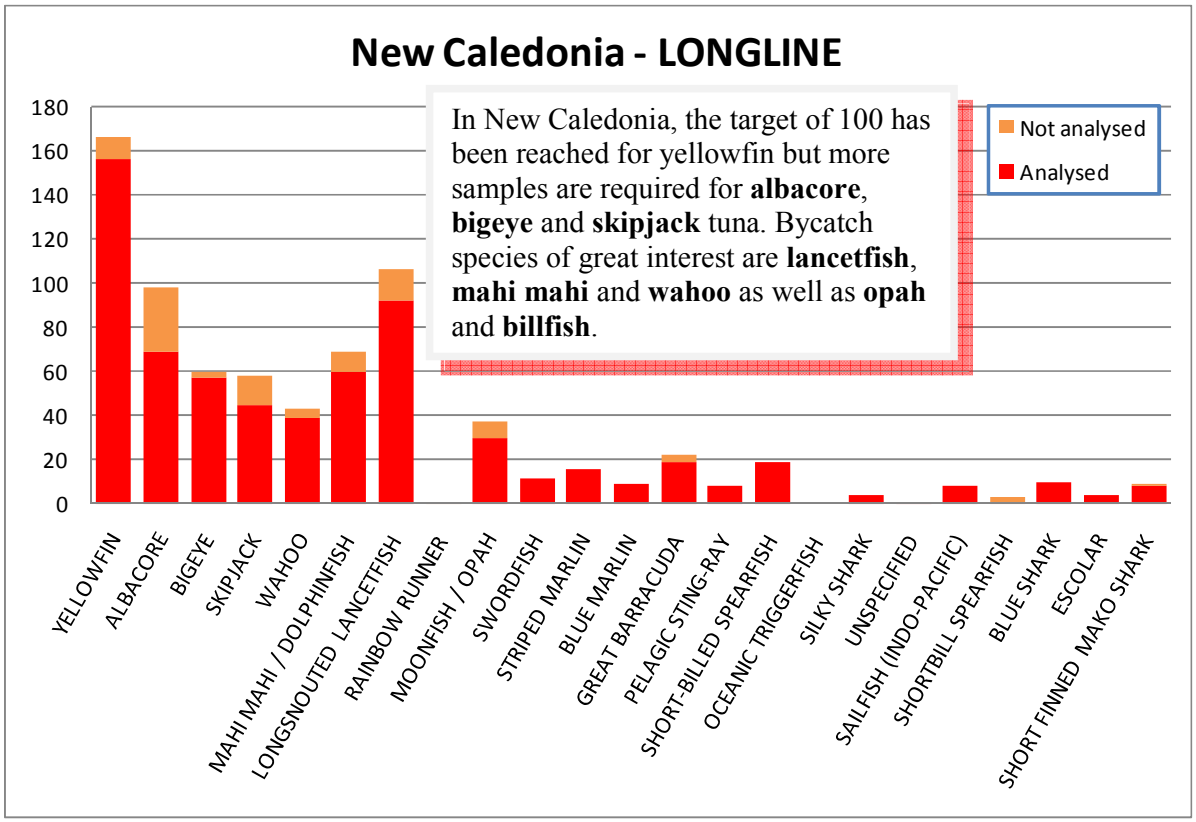


Figure 2. Number of stomachs collected, analysed/not analysed for the New Caledonia area (longline).

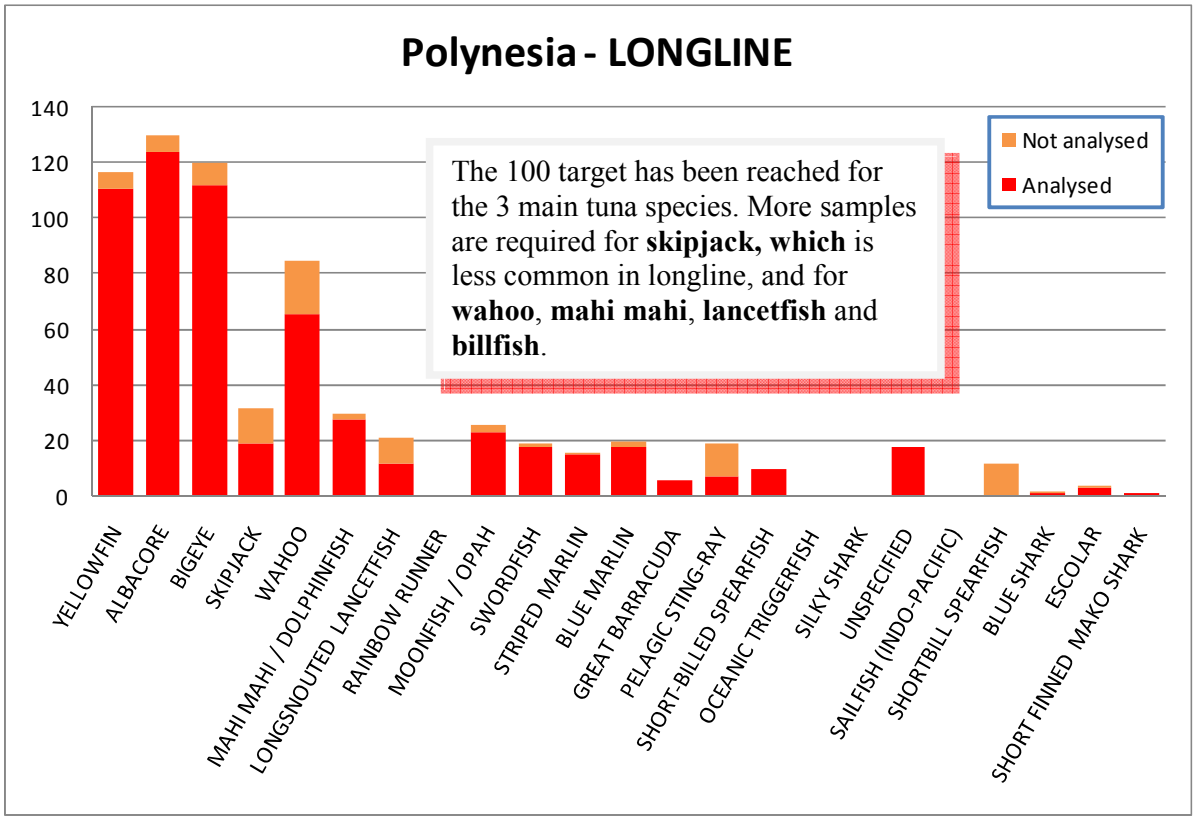


Figure 12. Number of stomachs collected, analysed/not analysed for the Polynesian area (longline).

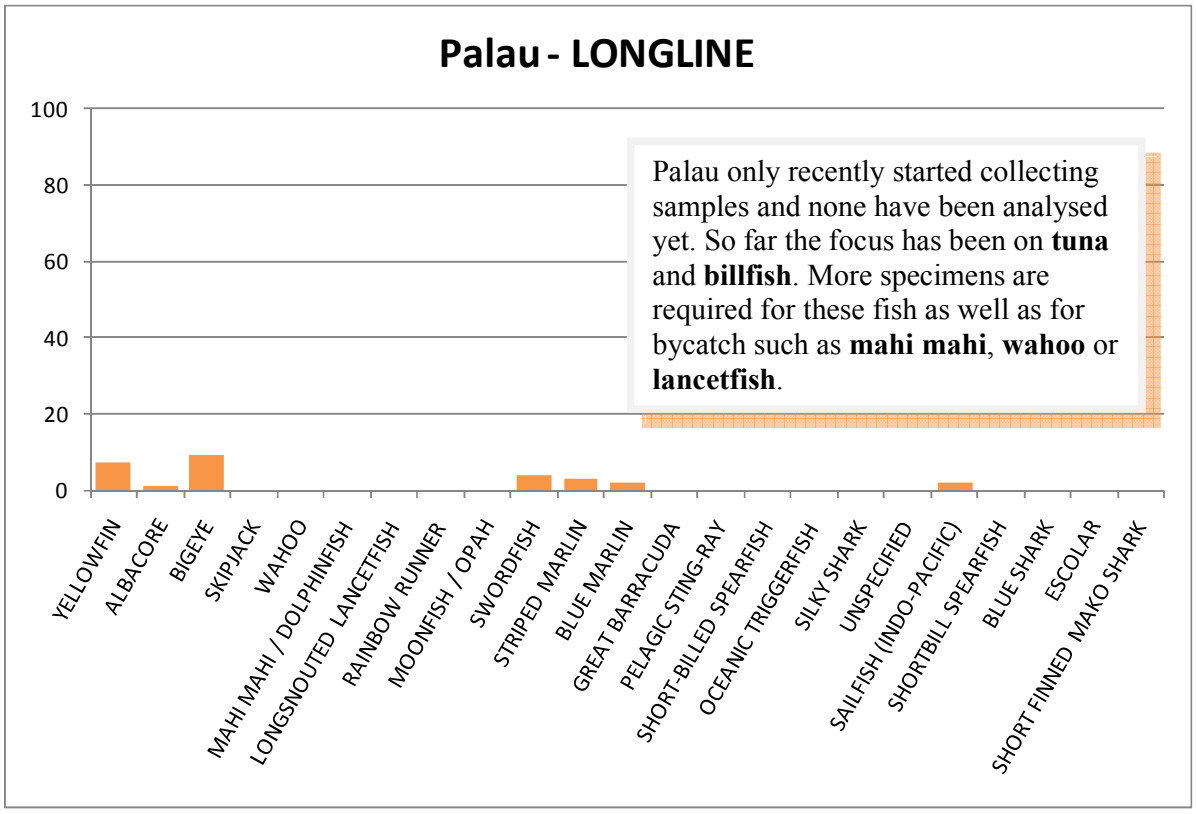


Figure 3. Number of stomachs collected but not yet analysed for the Palau area (longline).

NEXT NEWSLETTER – JANUARY 2010

We welcome your comments on the content of this newsletter — please send them to Valérie Allain (valeriea@spc.int) or Caroline Sanchez (carolines@spc.int).