

# Biological Sampling Newsletter

for Observers and Port Samplers

## SPC-OFP Ecosystem Monitoring and Analysis Section\*

Issue #7 – 15 July 2008

Welcome to the seventh issue of the newsletter of the Ecosystem Monitoring and Analysis Section of the SPC Oceanic Fisheries Programme. In this issue we introduce our new colleague and project, and update you on the sampling programme and tagging project.

### NEW PROJECT ON ALBACORE TUNA

Albacore tuna have become increasingly important for the domestic longline fisheries of Pacific Island countries and territories (PICTs). Since the early 1990s, catches of albacore by some PICTs have increased substantially from negligible levels to over 25,000 tonnes (t) per year (Figure 1). Recent stock assessments indicate that the albacore stock is currently not overfished, but there is uncertainty about some of the biological information used in these assessments – which in turn has resulted in uncertainty about the assessment predictions.

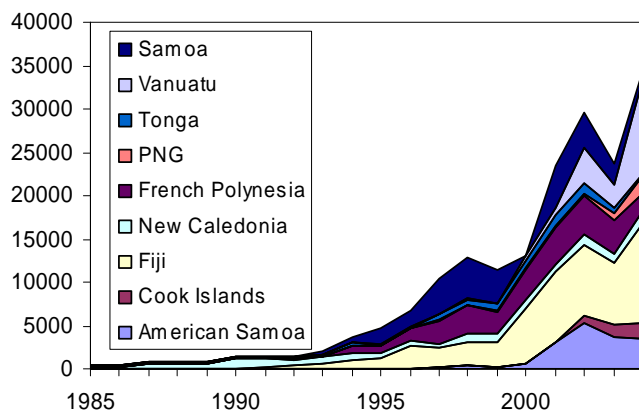


Figure 1. Annual catches (t) of albacore in the South Pacific by PICT domestic longline fleets from 1985 to 2006 (adapted from Langley 2006. The South Pacific Albacore Fishery Management Issues of Relevance to Pacific Island Countries and Territories. WCPFC-SC2-2006/SA WP-3 Manila, Philippines.).

Led by SPC's newly recruited albacore biologist Ashley Williams, scientists at OFP have just commenced a new project that aims to greatly improve our understanding of albacore biology in the South Pacific. The overall objective of the project is to obtain a better understanding of the population dynamics, behaviour and biology of albacore and to incorporate this information into models used to assess the status of albacore stocks. Specifically, the project aims to

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provide estimates of growth rates, fecundity, and age and size at maturity for albacore, which are the key biological parameters for which information is urgently needed.

The assistance and cooperation of observers and port samplers throughout PICTs will be a fundamental key to the success of this project. Observers and port samplers are being asked to assist with the collection of important biological samples of otoliths and gonads from albacore. Other key information needed will be the length and weight of the fish and the time and location they were caught. Otoliths will be used to estimate the age of individuals and will be combined with length and weight data to provide a description of growth. Gonads will be used to determine the sex of individuals and estimate fecundity and maturity schedules. This information will then feed directly into updated stock assessments for albacore tuna, providing more robust assessment outputs.

The project aims to collect biological samples from the major PICT albacore fisheries across the South Pacific, from New Caledonia to French Polynesia (Figure 2). This will provide an opportunity to assess how much the biology of albacore differs across regions. Sample collection will also continue throughout the year for at least two years to allow seasonal patterns in biology to be examined.

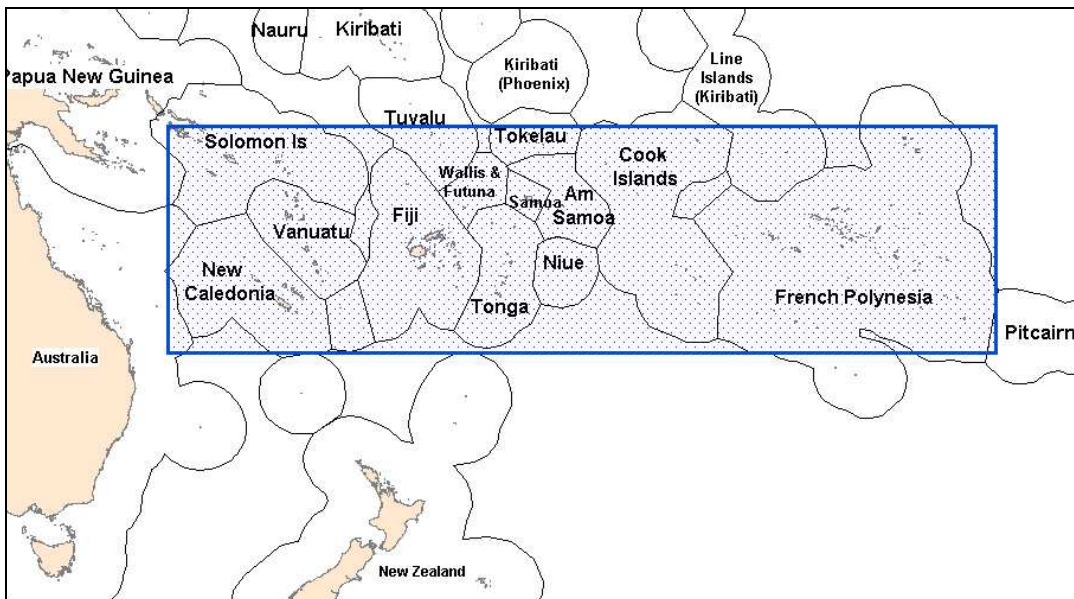


Figure 2. Approximate area from which biological samples of albacore will be collected.

Details of methods for collecting samples, including otolith extraction and gonad dissection, will be provided to observer coordinators very soon. For further information, please contact Dr Ashley Williams (ashleyw@spc.int).



**PACIFIC TUNA TAGGING PROGRAMME (PTTP): COMPUTER TAGS RECORD TUNA LIFE**

PTTP started in August 2006 and covered the EEZ of Papua New Guinea and Solomon Islands in eight and a half months. Along with over 100,000 conventional tags, 318 archival tags were deployed during that time (Table 1). Figure 3 shows the distribution of the releases by species. To date (July 2008), 44 archival tags have been recovered (1 skipjack, 32 yellowfin and 11 bigeye) for a recovery rate of 13.8%.

Species	Free school	FAD	Drifting FAD	Log	Whale shark	Current line	Seamount	Total	%
BET	13	42	1					56	17.6
SKJ		2						2	0.6
YFT	64	178		8	2	2	6	260	81.8
<b>Total</b>	<b>77</b>	<b>222</b>	<b>1</b>	<b>8</b>	<b>2</b>	<b>2</b>	<b>6</b>	<b>318</b>	<b>100</b>
%	24.2	69.8	0.3	2.5	0.6	0.6	1.9	100.0	

Table 1. Number of archival tag releases by species in PNG and Solomon Islands waters.



Bruno Leroy and Thomas Usu insert an electronic tag into a yellowfin tuna.

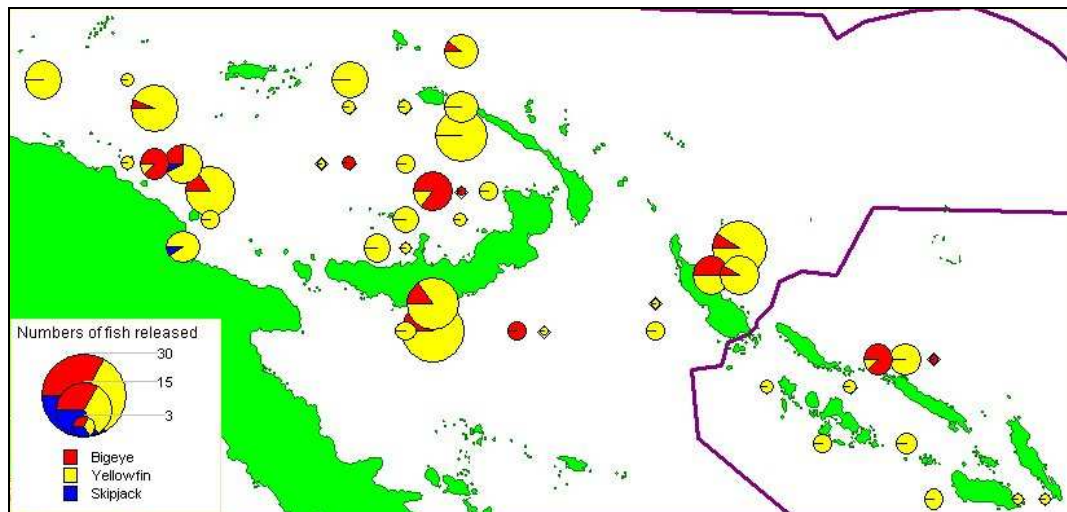


Figure 3. Archival tag releases in PNG and Solomon Islands waters.

## Some results

Although they still need some improvement in terms of reliability, the archival fish tags are now part of all the main tuna tagging experiments and continuously bring us more detailed and fascinating information about the behaviour and movements of these pelagic fish.

In Figure 4, we can observe some very different diving behaviour types in the data recorded by an archival tag deployed in a bigeye tuna. Trying to link these observed behaviour types to the fish's surrounding environment is one of many analyses that can be conducted on the registered data. For example, it is observed that fish swimming under a FAD are presenting a 'shallow behaviour', staying mostly between the surface and 100 metres depth.

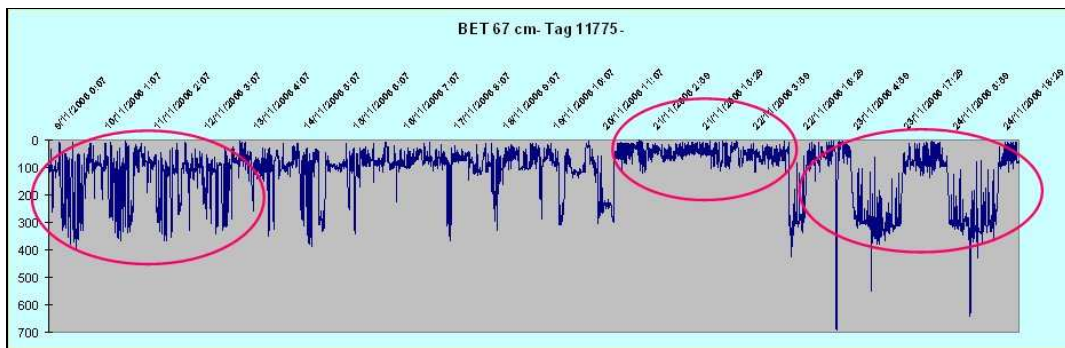


Figure 4. Recorded data of an archival tag showing the depth location in metres (vertical axis) of a bigeye tuna according to time (horizontal axis) from 9 to 24 December 2006. Different bigeye diving behaviour types were identified (red circles).

In Figure 5, the archival data shows clearly how a juvenile bigeye tuna was moving in the water column to regulate its internal temperature: the tuna stayed all day between 300 and 400 metres depth but had to regularly come up to warmer water to avoid its internal temperature dropping under 15–13 degrees (C).

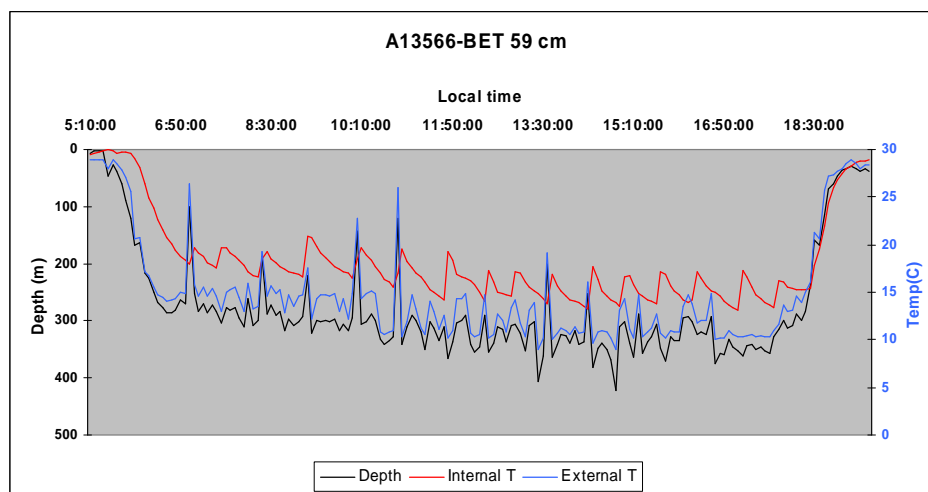


Figure 5. Daytime vertical behaviour of a bigeye tuna registered by an archival tag.

We are still in the early days of the data analysis and need to wait until the end of the fieldwork phase of PTPP (end of 2009) to really 'dive into' the huge amount of data provided by the archival tags. No doubt we will learn more about the tuna world at that stage!

## PACIFIC TUNA TAGGING PROGRAMME (PTTP): TAG RETURN LOTTERIES



SPC is conducting a regional tuna tagging project: the Pacific Tuna Tagging Programme (PTTP). The collection of tag recovery data is an important component of the project and SPC has been implementing tag recovery procedures to collect and refine these data. As part of the tag recovery procedures, lotteries are being conducted in key locations. The aim of the lotteries is to re-publicise the tagging project in order to maintain it in the public consciousness; reinforce the tag recovery procedures and the tag recovery contacts; and 'flush out' tags that have not yet been returned.

The first tag return lottery was held in Bangkok, Thailand, during the Tuna Conference 2008 hosted by Infofish. The names of tag finders from all the tags returned from canneries in Thailand were pooled and three winners were drawn. The draw was done by Ms Prulai Nootmorn, Director of the Andaman Sea Fisheries Research and Development Centre of the Thailand Department of Fisheries, and Dr Antony Lewis, a consultant with the SPC Tuna Tagging Project. Brian Kumasi, the Fisheries Technician (Tuna Tagging) of the OFP Ecosystem Monitoring and Analysis Section, attended the Tuna Conference specifically to publicise PTTP to tuna industry participants.



Ms Prulai Nootmorn and Dr Lewis drawing the winners, accompanied by Brian Kumasi.

1<sup>st</sup> prize – digital camera – Mr Te Aow  
2<sup>nd</sup> prize – mobile phone – Mr Win Khai  
3<sup>rd</sup> prize – MP3 player – Mr So

More tag return lotteries are planned to be conducted during the course of the year in major tag return centres (e.g. PNG, Solomon Islands).

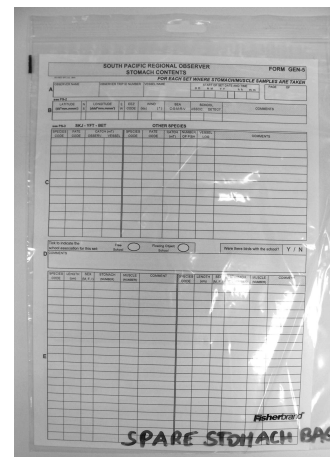
## STOMACH SAMPLING: ADVICE TO ENSURE GOOD-QUALITY SAMPLES

The stomach sampling project that began in 2001 is continuing, and in addition to the samples collected by OFP scientists recently onboard the tagging cruises, we keep receiving samples collected by observers from the region. These observer samples are unique as they allow us to reach the broadest spatial coverage as well as sample fish of different sizes from longline and purse-seine vessels, and bycatch species.

Unfortunately, in the past few months some samples have been received in poor condition (defrosted) or with no data, and we have had to throw out these useless samples. It is very frustrating for all of us: the observer who collected the samples, the coordinator who sent them and, finally, the scientists who cannot use them.

To avoid more frustration and waste of time and energy, and to ensure reliability and quality of the results, we offer the following advice.

1/ The waterproof logsheets **GEN 5** used on purse-seine sampling vessels are sometimes missing (or lost). During the debriefing, the coordinator should make sure a GEN-5 logsheet has been handed in by each observer. Then, to ensure that these fundamental papers remain with the samples sent to us at SPC, please make sure they are located with the samples **in the Esky**. You can easily place the waterproof logsheets in a spare plastic stomach bag, which will keep them clean in the Esky.



2/ When collecting samples and placing them in the plastic bags, **stomach** samples should be separated from **muscle and liver** samples (the liver bag being inside the muscle one). Stomach samples are studied **separately** from muscle and liver ones, and it is therefore easier for us to sort out samples later if they are separated initially.

3/ Rehydrated **Gelice packs** have to be kept in a **freezer** for more than **48 hours** prior to placing them in the Esky with the samples. **Samples** must be put at the **bottom** of the Esky and the **Gelice on top** of them (cold goes downwards). Try to fill the Esky with as many Gelices as possible: when there is air in the Esky, the temperature will rise much more quickly and there is a risk of the samples defrosting.

4/ Finally, and very importantly, PLEASE make sure you **contact us** prior to sending samples. We need to organise to get them from the airport when they are sent by air freight or with a passenger, and to manage the quarantine issues. Again, doing this will ensure appropriate conservation of the samples and increase the reliability of the results.

**STOMACH SAMPLING: GAPS IN THE SAMPLING STRATEGY**

The Oceanic Fisheries Management Project funded by the Global Environment Facility (OFM-GEF Project), which is funding the ecosystem study and stomach sampling programme, is entering its final phase. The project will finish in October 2010 and before we stop sampling, probably towards the end of 2009, we would like to fill in the gaps in our sampling strategy programme. This will allow us to obtain optimum spatial coverage and collect the appropriate number of samples to ensure good qualitative and quantitative results on diet studies and ecosystem modelling.

You have been doing an extremely good job up until now and the collaboration has been successful. Here is a map of the missing samples we need to complete a good sampling programme (Fig. 6). Thanks in advance for continuing to collect samples and helping us fill in the gaps on the map.

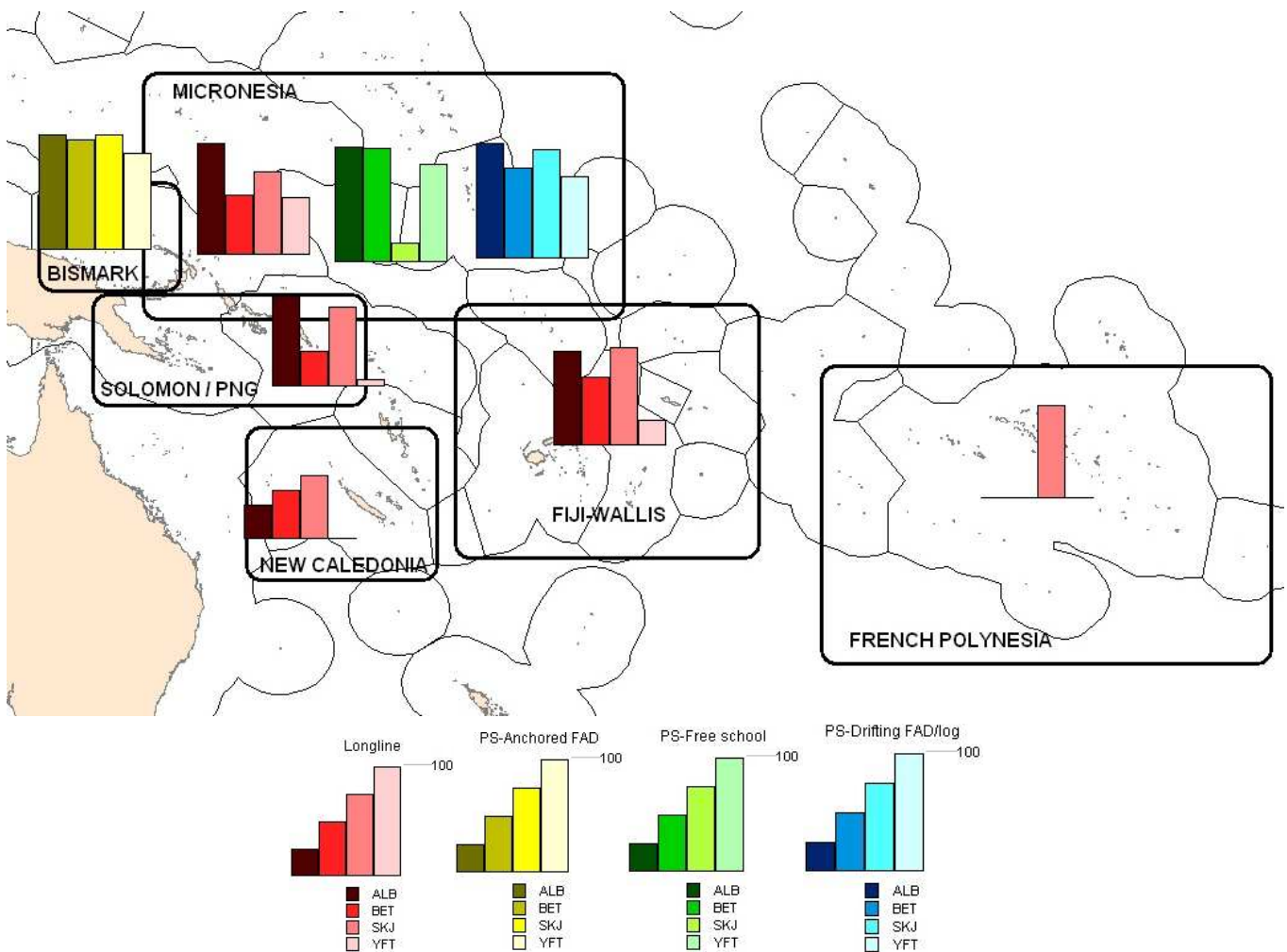


Figure 6. Map indicating the number of missing stomach samples for the 4 tuna species according to areas and gear types.

**NEXT NEWSLETTER: END OF SEPTEMBER – BEGINNING OF OCTOBER 2008**

Your comments on the content of this newsletter are welcome – please send them to Valérie Allain ([valeriea@spc.int](mailto:valeriea@spc.int)), Caroline Sanchez ([carolines@spc.int](mailto:carolines@spc.int)) and/or Aude Chenet ([audec@spc.int](mailto:audec@spc.int)).