

Fork length



The Observer and Port Sampler Newsletter
for the Tuna Fisheries of the Western and Central Pacific Ocean — Issue #3 — October 2001

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Finally - the third edition of the observer and port sampler newsletter. It is a delayed edition, but deliberately so. We held this copy back so we could report on FFA's observer coordinator's meeting, which was held in Pohnpei this past June.

This later edition also meant we could capture any suggestions that regional scientists attending the Standing Committee on Tuna and Billfish (SCTB) had for observer programmes. Their main suggestion was that observer coverage needs to be increased. We have gone some way towards that goal with the appearance of a new National Observer Programme in Kiribati. A brief report on their training course can be found inside.

You may have noticed the introduction of a new logo on the recently distributed observer workbooks. If you glance above and below you will notice that the logo has now become a part of the newsletter. It was designed by SPC's graphic artist Jipé Lebars. We hope to use this logo more extensively in the future, to integrate the different national observer programmes as they work together towards the same goal, and perhaps one day under the same regional observer programme. We have also asked Jipé to take up his pen again to illustrate the recently completed port sampling manual, which should help the port samplers avoid some of the pitfalls of their work.

And so on with Fork length. We hope you will learn a little bit more about observer and port sampler's work and what your colleagues in the region are up to. Suggestions are always welcome.

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Coordinator's Meeting

FFA's third meeting of National Observer coordinator's took place in Pohnpei at the end of June.

Coming two years after the last meeting, the workshop provided an opportunity to discuss a variety of common topics that coordinators face daily in their national positions.

Representatives from Australia (Wade Whitelaw), Federated States of Micronesia (Tim Park), Forum Fisheries Agency (Karl Staisch), Kiribati (Raikaon Tumoa), Marshall Islands (Glen Joseph and Sael Kalles), Papua New Guinea (Noan Pakop) Secretariat of the Pacific Community (Deirdre Brogan), Solomon Islands (Titus Pidiri) and New Zealand (Andrew France) were all present for the three-day meeting.

The meeting commenced with an outline of the national programme's profiles. During the first morning we heard about the rapid growth of PNG's programme, the inception of a new programme in Kiribati, and the temporary suspension of work in Solomon Islands, due to the civil unrest there. The Marshalls Islands explained how they needed to continually deploy observers as port samplers to cover the numerous purse-seine vessels unloading in their main harbour, while FSM proudly reported on another complete and successful year.

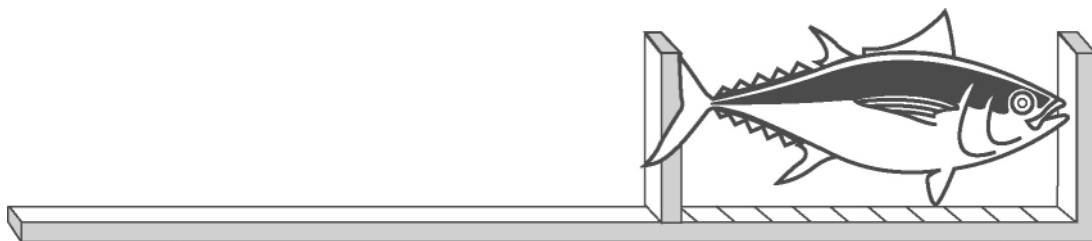
New Zealand's well-run programme was seen as a robust template for national programmes seeking guidance. Countries can also look towards Australia which does not currently have a tuna observer programme, but has plenty of previous experience and it is likely they will recommence their programme in the near future.

Australia is presently attempting to put in place the framework they need to run a successful observer programme. This will include looking at costing, funding sources, coverage rates and recruitment and training needs. These are the same problems that many new Pacific Island observer programmes are facing, Australia has very generously agreed to lend their support to any programme seeking guidance on these matters.

SPC outlined some of its recently completed papers with relevance to observer programmes, including a review of all observer data held by SPC and one on turtle bycatch in the tuna fisheries. SPC also outlined upcoming plans for stomach sampling and standardised data quality control. FFA enlightened participants on the broadening focus of observing with the recently initiated pollution report forms, and also the move to recognise USMLT-trained observers by IATTC (Inter-American Tropical Tuna Commission). FFA was also pivotal in drawing attention to the need for regional cooperation between the observer programmes, not only in the case of harmonised forms or in aiding observers who land outside their national harbours but, more importantly, with the proposed regional observer programme.

The meeting was deemed a success due to the active participation of the coordinators, the appetizing dinner of crabs served at the host's home (Tim Park), and the funds provided by FFA.

A copy of the completed report will be available shortly.



Focus on FADs (fish aggregating devices)

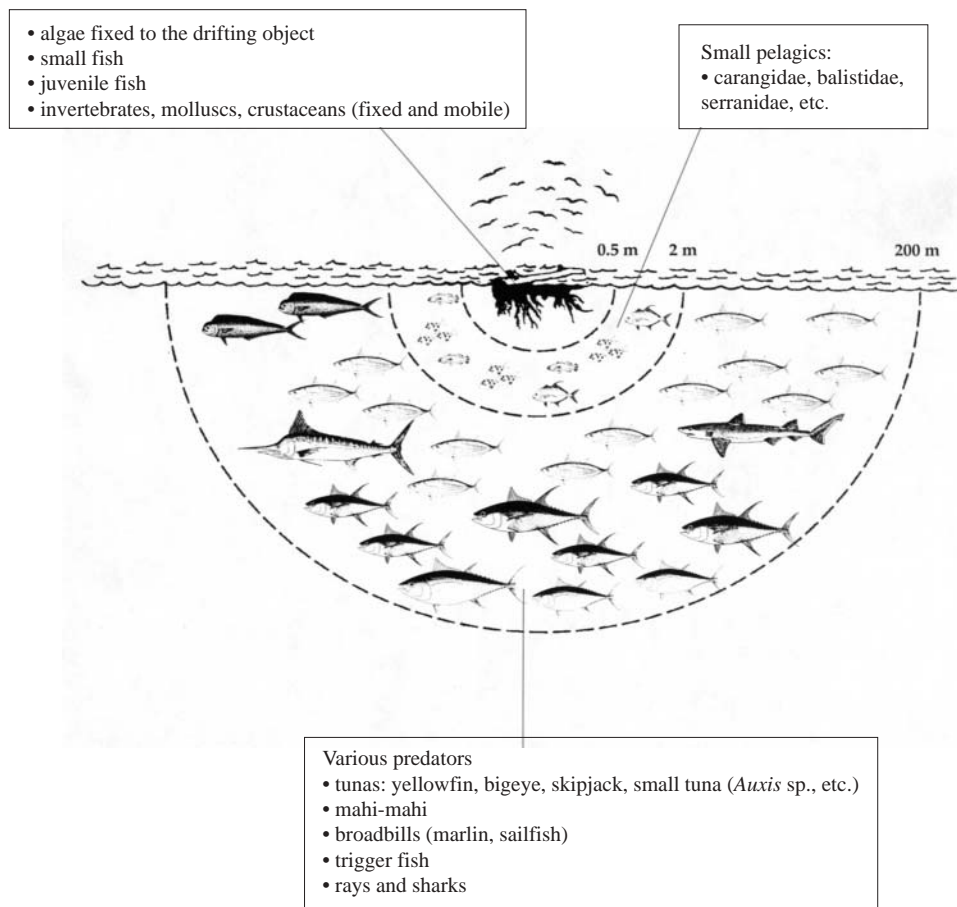
Pieces of wood lashed together and deployed into the sea deliberately are making waves in the world of marine science. Fishermen have always taken advantage of tunas' association with logs. The first records of anchored FADS come from the Mediterranean Sea as far back as the 17th Century.

In the Pacific, anchored FADs have dotted the archipelagic waters of Papua New Guinea, the Philippines and the Solomons Islands for more than 30 years now, but the sudden and dramatic increase in the use of drifting FADs has left us with some work to do. To evaluate the status of the tuna stocks, scientists need to understand not only the fishing effort associated with drifting FADs, but also the mixed species landings and the effect an increase in FAD numbers on general tuna movements will be, both in the short and

long term. And while scientists work on the theories to explain the process, observers will be asked to provide data that will tie the assumptions together.

Tuna are the only gregarious fish to aggregate around floating objects. The reason they do so remains unclear, but it seems tuna are more interested in the 'social advantage' than a feeding opportunity. In the vast featureless ocean, dispersed tuna can aggregate faster with a reference point.

Various diet studies have shown that the stomachs of tunas near FADs are mostly empty, or filled with prey sourced well away from the FAD. The 'social advantage' may be lost, however, on the few smaller tuna who fall prey to their cannibalistic elders. We now know that the shape,



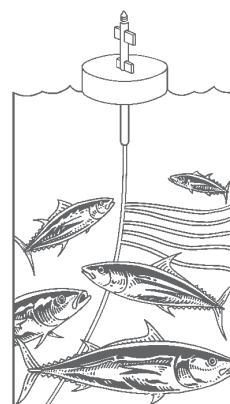
The marine life related to a floating object

nature, colour, size (providing it is over 1 metre long) or duration of immersion, has no effect on the number of fish that will aggregate around a log. It is possible, though, that the floating object offers a substrate for algae, crabs and barnacles that attract a small number of trevallies, groupers and triggerfish, and that this could act as a minor food supply, by 'fixing' the first fish, attracted by the easy prey.

Once they get to a FAD, tuna don't stay there. Work done on anchored FADs in recent years has given us a good understanding of the movements of tuna around FADs. Tuna with small transmitters attached to their back have been tracked by sonar. These studies confirmed the attachment tuna have to FADs, as the transmitting fish generally returned to the FAD or moved onto a neighbouring one. Acoustic surveys (using sound waves) show the number of tuna that stay around the FAD.

Tuna tend to congregate around FADs during the day and leave during the night, most likely to forage for food. The peak in tuna abundance around the FAD is just before dawn, coinciding with those early morning sets that observers on purse-seine vessels know so well.

Tuna movement around FADs is not just horizontal. Tunas also move frequently between the depths and shallow waters, searching for food, avoiding predators, and maintaining their thermal and oxygen equilibriums. And you won't find all the tuna hanging around surface waters like a boiling free school. Tuna associated with FADs can be found more than 200 meters below the FAD, with the larger fish preferring deeper waters.

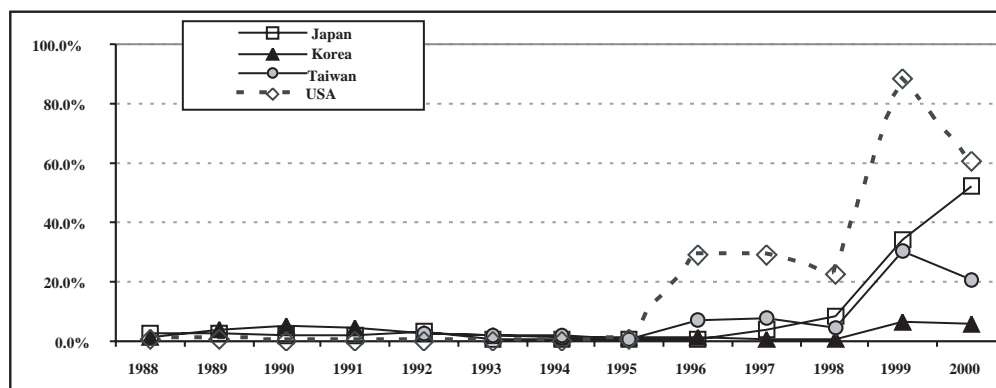


Most of these studies have been done on anchored FADs and our attention now needs to move towards drifting FADs. The things you learned at basic training count. Differentiating between juvenile bigeye and yellowfin is a critical task when sampling fish from FAD sets.

Also, so that we can quantify the number of FADs a vessel investigates before making a set, don't forget to fill in the 'beacon/payao' number on your daily log sheet. It will also give us an idea of how many sets a vessel makes on the same FAD - if they choose to do so.

References

- Holland, K. 1996. Biological aspects of the association of tunas with FADS. SPC FAD Information Bulletin # 2.
- Bach, P. et al. Experimental research and fish aggregating devices in French Polynesia, in SPC FAD Information Bulletin # 3.



Percentage of total sets on drifting FADs over time

Josse, E., L. Dagorn and A. Bertrand. 2000. Typology and behaviour of tuna aggregations around fish aggregating devices from acoustic surveys in French Polynesia. *Aquatic Living Resources* 13(4):183.

Bailey, K. and J. Hampton. 1993. Fishing for tunas associated with floating objects: A review of the western Pacific Fishery SPC Technical Report No. 31.

Fonteneau, A. and J.P. Hallier. 1992. Fishing for tuna around floating objects. *La Recherche*, No. 248.



Observer Training Workshop - Kiribati

The latest observer training workshop was held in Tarawa, Kiribati from 16 May to 1 June 2001. The Forum Fisheries Agency (FFA) funded the observer training workshop, which was coordinated by Karl Staisch (FFA's Observer Programme Manager). The Secretariat of the Pacific Community (SPC) funded Siosifa Fukofuka (former SPC Scientific Observer) to assist and train the observers.

The aim of the workshop was to give fisheries observers training in basic navigation, data collection, life on board tuna boats, fishing gear and methods, law and observer's rights, management of oceanic fish stocks, compliance and scientific reporting, species identification, and collecting biological samples.

In-country training is continuing around the region with the hope of maintaining enough observers for both the national and the proposed regional observer programme. An observer programme is vital to the collection of good baseline data for monitoring and managing tuna resources in the Pacific region.

Nineteen participants were chosen from 40 applicants. The venue for the workshop was the Fisheries Department, 26 kilometers from the main town of Tarawa. Observers that were trained and certified from this workshop will be start doing observer work on US purse-seine vessels, currently fishing under the US Multilateral-Treaty (USMLT).



Participants at Kiribati's Observer Training Workshop.

However, it is also hoped that this workshop will contribute to establishing a national observer programme for the Republic of Kiribati. Kiribati has the largest exclusive economic zone, with a large number of purse seine and longline vessels targeting commercial tuna species, mainly yellowfin (*Thunnus albacares*), skipjack (*Katsuwonus pelamis*) and bigeye tuna (*Thunnus obesus*). SPC and FFA will continue to assist the Fisheries

Department in their observer activity. Port sampling at Tarawa and Christmas Island is funded by SPC under the Oceanic Fisheries Programme.

Siosifa Fukofuka

Form Changes

Change is a fact of life and for the regional data forms it happens every two years. In December of 2000, under the auspicious title of 'Data Collection Committee', staff from FFA, SPC, MFA (Micronesian Fishing Authority) and NMFS (National Marine Fisheries Service) got together to review the regional data forms that many of you use every day.

The report of the meeting, which has been circulated and is available on SPC's website <www.spc.int/oceanfish>, documents all the changes that were made, why they were made and even notes why some changes were not made. New editions of the observer forms have been printed and circulated. Observers should ensure they only use forms marked FFA/SPC DEC 2000 (in the upper left-hand corner) from this point on. No other forms are acceptable. (Please note though that longline catch monitoring form 'Form LL-4' -SPC/FFA 1998- is still in circulation as there were no changes and the cost of printing on waterproof paper is high)

So what changes have been made? Many of the changes reflect the introduction of new equipment into the industry (see the article on 'New Technology'), but beyond documenting the type of gear present, observers should note whether the vessel actually uses this equipment, hence the appearance of a query on 'equipment usage' on all the general information forms. Do you know the four different brailing types? It seems that most observers don't, so now you'll be asked to describe the complete brailing operation. There are many different things to look at during brailing. How is the mouth of the net held open? Is it

with the skiff or with a boom? How about the handle on the actual brail? Is it a short or long type? If you describe these and the various booms and winches, used during brailing, you will be well on your way to describing the brailing technique. Another new feature of the purse-seine forms include a new activity code, as well as some old questions on the "Set Details" sheet that are asked in a different way. Finally, we had the observers in mind when we re-arranged things so that all the information you collected while on the purse-seine deck, is recorded on the waterproof form 'PS - 4'.

Other than the questions on the new gear and equipment, there were no other major changes to the longline and pole-and-line forms. This reflects the hard work done in the past to develop these forms. One bit of news is that we have lost one full form 'PS - 5' Well Loading, which is now optional) but we have also gained another one, 'GEN - 6' Pollution Report which has been introduced to report on an area of growing concern: marine pollution caused by vessels. The form comes with a full list of instructions, but it is hoped that this will be complemented by SPREP's 'Pocket Guide to Marine Pollution', which will be available shortly.

Observer forms are used by you. Observers are often the best people to know which changes should be made. Let us know if there is something on the forms you would like changed, even if it is just something that is bugging you, or even something you feel should be introduced. We will be happy to discuss any of your suggestions at the next Data Collection Committee meeting.

Stomach Contents

Do you enjoy eating tuna for lunch? Did you ever stop to think about what a tuna eats for lunch? In fact, this is an important question, and one which the new Ecosystem Scientist at SPC, Dr Valérie Allain is trying to answer. In order to understand the tuna stocks of the Pacific we need to understand tuna feeding behaviour and preserve the species they feed on.



With the help of observers from around the Pacific, Valérie hopes to collect and analyse stomach contents from as many species as possible. She also hopes to collect muscle samples from the same fish. Muscle samples will be

analysed for both nitrogen and carbon. Top predators (i.e. sharks, marlins and tunas) accumulate the heavier isotopes of these elements, in their flesh, much more so than fish further down the food chain (i.e. anchovy). With all this information at hand it should be possible to figure out the complex food chain, of which tuna are a part.

Valérie is preparing a sampling protocol and hopes to figure out a way to get her frozen samples back to Noumea. When all that is arranged, observers will be fully informed on how they can help to further our scientific knowledge of tuna and the associated ecosystem.

New Technology

Out amongst the waves, hauling in the day's catch it may be easy to leave the world behind, but isolating as it is, the fishing industry has not been by-passed by 21st century technological gains.

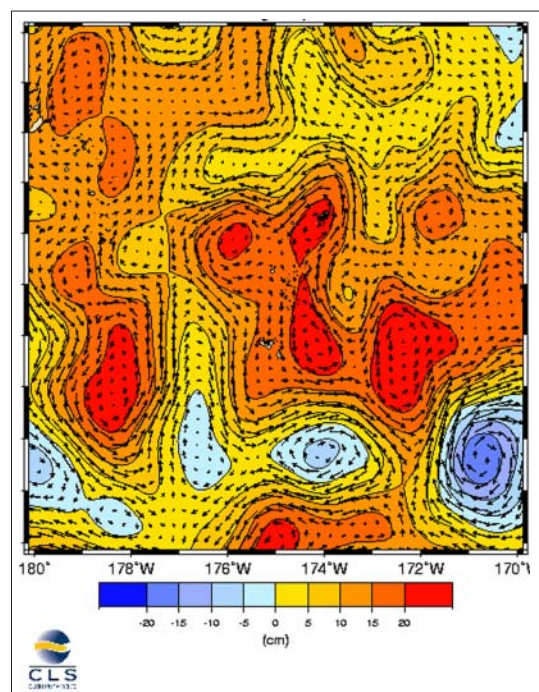
As mentioned in an earlier article, the latest edition of the observer forms tries to capture these new developments. The term 'Fishery Information Services' has been coined to cover websites that cater and provide up-to-date information on the oceanic environmental conditions which are important for fishing vessels.

Most of these services use satellites to record up-to-the-minute environmental details – such as sea-surface temperature (SST), sea level, water colour, or plankton density and thus help direct fishermen to the best fishing grounds. Such information helps to reduce searching time and removes the guesswork from of fishing.

While a number of websites offer these services, they may, like others in the dot.com industry disappear overnight, or new websites appear just as easily. For that reason, observers are asked to note the name of the website, or company providing the service to the vessel.

One company we know of is called Orbimage, another is CLS. We have shown you a CLS altimetric map below.

Altimetric maps show differences in sea level and while wave height is of no real interest to fishermen, sudden changes in sea level indicate oceanic eddies or fronts, which can indicate productive fishing spots.



Altimetric map

Altimetric maps also have the advantage of being radar based and thus are not affected by cloud coverage, a factor that often infringes on the accessibility of sea temperature or plankton maps. In another developing area, vessels also have the option of generating their own maps or 3-D seabed maps. Using a depth sounder, vessels can build a comprehensive picture of local sea beds and the all important seamounts and ridges.

Radio buoys are one example of the increasing reliance of vessels on satellites. In the late 1970s, the standard radio buoy emitted constant radio waves, had a limited battery life (up to four weeks), and had a detection range of only 90 nautical miles.

During the 1980s and the 1990s, radio buoys improved with each new design. With 'sel-call' buoys came the concept of a 'sleep mode' which, extended the life of the battery. This was coupled with an increase in their detection range to 150 miles and subsequently 200 miles. The next

major breakthrough in radio buoy technology came with the GPS buoy system which increased the detection range – up to 900 miles and gave a GPS location reading, allowing the vessel to save time and fuel by steaming direct to the buoy.

Technology really came to the fore three years ago, with buoys that gave GPS, sea-surface temperature (SST), battery level readings, and were supplemented with solar panels to re-charge the batteries. They even came with a flashlight so the vessels could locate the buoy in the dark.

The latest design now communicates with the vessel via Immarsat (satellite), allowing for a limitless detection range by the vessel but without a radio antenna, detection by other vessels is virtually eliminated. These radio buoys not only send back position information, but SST, sonar and battery readings as well. Such high-tech radio buoys allow vessels to target sets associated with floating objects on a more regular and successful basis.

Other technological developments, which may not be as impressive but help to reduce fishing time and perhaps increase catches, are also appearing. Automatic branchline attachers have begun to appear on longline vessels, as have new lights that will effectively replace the chemical lightstick, which were attached close to the hook.

These new Electralume™ lights last up to three weeks without a battery change. Longline fishermen may also start to put temperature depth



GPS buoy



Sonar buoy

recorders (TDRs) on their lines, especially as they come down in price.

It is an important part of the observer's job to report any new developments they see on board. Still, observers will often need a certain amount of diplomacy to record such details.

Fishermen may be reluctant to discuss or show their latest 'toy' for fear the rest of the fleet will take advantage of such information - so proceed with caution! Who knows what the next development will be, or who will be the first observer to document their use onboard? Maybe you?



The Electralume™

Digital Observer

Did you ever think that observing could be as simple as watching TV? Well it's not that easy, but current work by Archipelago Marine Research, in British Columbia, Canada could turn such a bizarre notion into reality.

The company plans to monitor longline catches by housing a camera - with a wide-angled lens, a GPS and a video - in a secure unit. Positioned with a bird's-eye view of the gate, any fish lucky enough to be hauled on board will get a chance to smile for the camera. Snapshots - imprinted with the time, data and location and taken every 10 seconds should give a complete record of the vessels catch.

There are still many hurdles to overcome, both technical and political. Fish that come on board alive and thrashing aren't exactly the easiest to identify with a photograph, and what of a species that is struck off before landing? Still the team feels confident that many of these problems can be rectified.

Don't switch on the TV just yet! Perhaps the digital observer will eventually make its way toward the Pacific Ocean, but the role of the 'human' observer is assured. There will always be a need for biological sampling and someone to verify the work of our digital colleague.

Source: Matt Barron. *The Digital Observer* - Mail Buoy Newsletter. Vol. 5 (www.apo-observer.org)



Summary of data collected by port samplers in the region during 1999, including number (range) of vessels sampled and number of length frequency samples recorded (Final)

Country	Port	Gear	Size Sampling						
			Vessels	SKJ	YFT	BET	ALB	OTH	TOT
FSM	CHUUK	L	39	0	1,259	1,498	0	90	2,847
		S	39	6,989	3,059	667	0	0	10,715
	KOSRAE	L	55	1	5,932	4,158	3	88	10,182
		S	13	1,628	275	72	0	1	1,976
	POHNPEI	L	53	0	3,895	4,551	19	499	8,964
		S	10	789	125	48	0	0	962
	FSM TOTAL			9,407	14,545	10,994	22	678	35,646
FIJI	LEVUKA	S	3	1,098	488	51	0	0	1,637
	SUVA	L	54	0	4,662	4,119	5,909	1,107	15,797
	FIJI TOTAL			1,098	5,150	4,170	5,909	1,107	17,434
FRENCHPOLYNESIA	PAPEETE	L	18	0	762	270	99	1,158	2,289
MARSHALL ISLANDS	MAJURO	S	70	133,789	51,932	3,815	0	34	189,570
NEW CALEDONIA	NOUMEA	L	12	0	6,205	2,305	23,053	5,263	36,826
PALAU	KOROR	L	206	0	21,038	30,480	389	3,623	55,530
PAPUA NEW GUINEA	RABAU	S	2	840	728	308	0	0	1,876
	WEWAK	S	5	565	532	103	0	0	1,200
	PNG TOTAL			1,405	1,260	411	0	0	3,076
SAMOA	APIA	L	228	11,556	10,136	1,046	42,469	6,182	71,389
	ASUA	L	8	219	732	31	798	186	1,966
	FAGASA	L	2	26	81	6	39	16	168
	FALEALILI	L	20	153	327	39	810	91	1,420
	SAFOTU	L	3	0	11	1	97	6	115
	SALEAULA	L	1	0	3	1	23	1	28
	SATAUA	L	20	107	206	16	449	36	814
	SAMOA TOTAL			12,061	11,496	1,140	44,685	6,518	75,900
SOLOMON ISLANDS	HONIARA	L	10	0	5,748	4,768	63	202	10,781
		S	3	184	246	20	0	0	450
	NORO	P	21	22,672	3,012	0	0	0	25,684
		S	1	34	100	0	0	0	134
	TULAGI	P	5	724	461	0	0	0	1,185
		S	3	1,401	1,026	5	0	0	2,432
	SOLOMON ISLANDS TOTAL			25,015	10,593	4,793	63	202	40,666
TONGA	NUKU'ALOFA	L	11	50	272	833	3,144	735	5,034
TOTAL				182,825	123,253	59,211	77,364	19,318	461,971



THINK don't THROW a message for all those who head at sea

The introduction of a new form, 'Pollution Report Form GEN- 6', shows the increasing concern we have about marine pollution, especially that caused by fishing vessels. Both port samplers and observers will now be asked to record details of any marine pollution incidents they see.

To increase public awareness on the matter SPC, in conjunction with the South Pacific Regional Environmental Programme (SPREP) and the Western Pacific Regional Fisheries Management Council, PACPOL and AusAID, have produced a new brochure highlighting the problems caused by debris and derelict fishing gear. Oil and plastics dumped overboard cause serious problems for the marine environment and samplers are urged to record any events of this nature that happen.

SPREP will soon produce and distribute an additional 'Pocket Guide to the Surveillance of Marine Pollution' to assist samplers with this work.

In the meantime we thought we would enclose SPC's brochure so you could get some idea of the problem. For instance how long does it take for discard monofilament line to break down. Would you believe **600 years!**

Have a read of the enclosed brochure to pick up some more equally fascinating facts.



Around the region



Koumac, New Caledonia

A new port joins the Port Sampling Programme. Pictured here are Alphonse Phadom and Sylvanna Gouassem, two recently recruited port samplers from Koumac in New Caledonia. For the first time, a number of longline vessels have started to unload in Koumac. Best of luck to our new sampler or as they would say themselves, 'bonne chance'.

Solomon Islands

Ivan Sesebo from Solomon Islands recently collected skipjack muscle samples for the University of South Carolina in the USA. Scientists there hope to look at the skipjack's DNA and figure out if skipjack from one part of the world are different from those in other parts of the world. The study is still on-going but we hope to be able to report on the results here when they are available.



Papua New Guinea

All refreshed and ready to go! Participants at PNG's refresher training held in October (2000).

Standing from left to right: John I gua, Max Weman, Ashley Barol, Elias Taule, Orim Popon, Daniel Poli, Gauwa Gedo, Mongop Waramapi, Pomat Litau, Andrew Rahiria, Albert Yeviura, George Pomat, Vaitas Lasaro, Jacob Eddie, Apelis Johannes, Noan Pakop (PNG's observer coordinator)

Kneeling from left to right: Philip Lens, Terrence Fininki, Greg Sera, William Kewo

Sitting from left to right: Eliaser Mutumut, Bernard Welleng, David Suap, Miro Logai, Alois Koyo, Thomas I kun

