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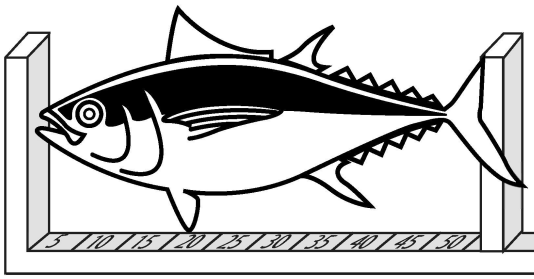

FORK LENGTH

Secretariat of the Pacific Community

The Observer and Port Sampler Newsletter

for the Tuna Fisheries of the Western and Central Pacific Ocean — Issue #2 — August 2000

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It's time to set your callipers aside, put your feet up and delve into the second edition of "Fork Length". We promised you an 'occasional' newsletter and this issue, following just ten months after the first, fulfills that promise. Changes within the SPC Observer Programme have delayed things slightly but we hope some other, positive changes will guarantee semi-annual editions in the future.

The end of SPRTRAMP (South Pacific Regional Tuna Resource and Monitoring Programme), and with it the end of the four scientific observer positions, is one such change. The work and the lives of these four intrepid sailors are highlighted in this edition.

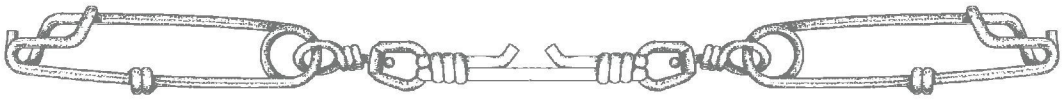
The recruitment of a 'Fishery Monitoring Supervisor', responsible for the flow and quality of data from the national programmes to SPC, increases the number of observer/port sampler supervisor positions at SPC to two. It is hoped that a third supervisor / trainer position will be created under the next round of European funding to SPC. This will allow SPC to build on their achievements in the tuna monitoring area and allow more time to be spent in the region, addressing problems at the grassroots level.

So, on with the newsletter. It has taken the same format as before – we had no complaints! We hope the addition of new staff will be reflected in future editions and will inform port samplers and observers of the latest work being done throughout the region and what issues or problems need to be addressed.

Developments in the observer and tuna monitoring fields have been significant, even if most of them have come from outside the region. The recent court order in Hawaii has directed the National Marine Fisheries Service (NMFS) to complete an Environmental Impact Study for the Hawaiian longline fishery, including impacts of the fishery on sea turtles. One initial component of this court order was 100% observer coverage. Again in the US, a new federal law banning shark finning has been passed by the House of Representatives and only needs approval from the Senate before becoming law.

Contents

For the fisherman, by-catch can be a nuisance, an extra chore even, but scientists see it differently. Increasingly they are turning their attention towards the problem. There is really only one way to monitor by-catch and that is with observers. So expect the workload to grow! No need to panic yet though. Still time to flick through the following pages before you start swinging those callipers around again.



Solomon Islands Observer Programme

Perhaps it's just the position of the office— situated as it is, beside the lapping tides of Honiara's shoreline—because the Solomon Islands Observer Programme seems to run in waves.

Its foundations are clear — following closely behind the establishment of the Fisheries Division in 1973, the observer programme came into being, early in 1976. Four observers lined up for the initial slots and the pleasure of testing the waters and the warmth of the welcome, onboard mostly domestic but also foreign vessels. Observers didn't have callipers in those days and data sheets were yet to come, but the work load was still challenging. Looking back on it now, their financial rewards seem lean; only two Solomon dollars per day, for a heavy work load, with periods of up to three months fulfilling sea time. Their efforts were first recognised in 1979, when their positions were made full-time, and then again in 1990 when a further five positions were created. The first glorious days of the Solomon Islands Observer Programme looped and crashed over the ban on transshipment at sea implemented in June 1993. The observers were called on to monitor the transshipments and actual observer duties took a back seat for a while. The first wave had bottomed out to a trough.

That was the position of the observer programme as reported at the first regional observer workshop held in Brisbane in early 1995. Later, further winds of change blew through and were channelled by some great observer co-ordinators including Manasseh Avicks and Michele Lam. Unfortunately, although they both had energy and vision, the currents of the time sent them in different directions.

Their successor, George Diau, had his work cut out for him when he took up the Co-ordinator position in early 1997. He was extended a full cordial welcome at the regional observer co-ordinators meeting in Nadi in mid-1997 but there was no lounging around the pool bar. George had to convince everyone around the table that Solomon Islands could produce a productive and sustainable observer programme. Supported by his superiors, back in Honiara, George Boape and Sylvester Diake, he presented his case. Once back in Honiara, the badgering and necessary legwork to meet these requirements and set up the framework, required by the funding donors, continued until finally they got their okay. Funds were allocated and the observer programme got a new lease of life.

Left to right: George Diau, Observer Co-ordinator and his assistant, Titus Pidiri.

The solid base of this new programme came from the recruitment of twenty new contract observers. The positions were advertised in the national newspaper and 340 people applied. An education standard, requiring full-time observers to meet public servants entry requirements, was fixed at Form Five leavers. That cut-off point reduced the number of hopefuls down to 50, and the final twenty were selected through interviews. Life at sea and the chance to work with the Fisheries Division was what attracted the majority to the post.

Some Solomon Islands observers, after an impromptu meeting on form changes, November 1999 (back row, left to right: Ben Lakwai, Jacob Walle, Christian Backalia, John Skill Villi; front row, left to right: Martin Jasper, Fredrick Auskin, Obed Awaohu, Thomas Bugoro).

The large number of purse seiners in Honiara during training kept trainees inspired. Training, provided by the FFA/SPC team of Karl Staisch and Peter Sharples, went smoothly. Certificates and congratulations were handed out to all. Vessels were plentiful at the time and so, one by one, the new observers embarked on their first trip.

They were shy at first and perhaps a little fearful as they settled into the unknown world of Taiwanese and Korean vessels, but with each trip the smile broadened and the requests to do more trips kept the Co-ordinator and his assistant, Titus Pidiri busy. Boredom was never an issue.

Trips on foreign purse seiners were complemented by boardings on the local purse seine boats (4), pole-and-line vessels (20) and the local longliners (including shark longliners) all of which retained the observers' interest. Certainly there were some errors in the first batch of data, but the observers shaped up with each briefing. By the end of the first year, a fine comb was needed to find any errors. Remarkably they covered 80 trips in 1988, 43 on purse seiners, 23 on pole-and-line vessels and 14 on longliners. It was a strong programme with some excellent, competent and experienced observers — some of the best in the region —that composed the Solomon Islands Observer Programme by the middle of 1999.

Rodney Sam hard at work, measuring fish from the pole-and-line vessels in Noro.

The port sampling programme, with four full-time samplers, two based at Noro and two at Tulagi, comple-

mented the observer admirably. Port sampling in Honiara is done by the observers as they wait for their next assignment. We're not sure what it is about the Solomons, but by the end of 1999 it looked as if another great cycle was coming to an end. For various reasons there were no foreign purse seiners licensed to fish in the zone and although procedures were put in place to allow the observers to cover the local fleet, the civil disturbances currently affecting the country have stalled that process. Perhaps it's just a matter of finding some shade, gathering a few wantoks around and waiting for the next wave to come in. You can be sure that whenever it happens, the Solomon Islands Observer Programme will navigate it well.

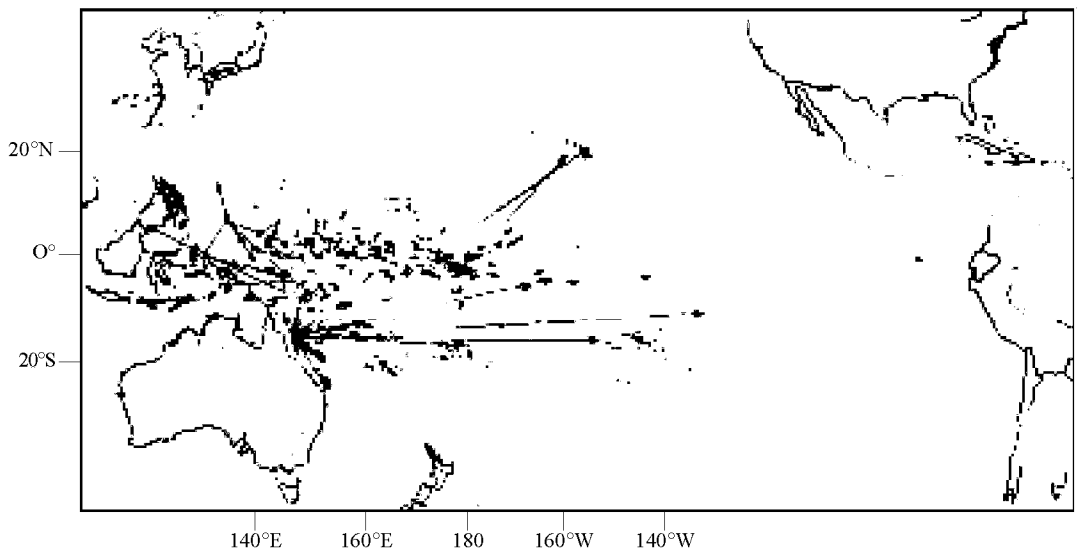
Bigeye Tuna

A burst of speed from the crew, a smile on the captain's face, always signals the arrival of a high-value fish. Bigeye tuna (*Thunnus obesus*) is one such welcome visitor. Second only to bluefin tuna in terms of value, bigeye tuna can command up to US$50 per kg for first grade sashimi.

Bigeye are found in the tropical and sub-tropical waters of all oceans. In the Pacific Ocean, bigeye typically are found between 45° N and 40° S. These waters provide the warmth and nutrition the fish needs. Adult bigeye tend to swim around independently often making long migrations, while juvenile bigeye are typically found in warmer tropical waters and in mixed surface schools along with skipjack and yellowfin. Tagging studies done by SPC during the Regional Tuna Tagging Project (RTTP)*, show that bigeye can make journeys of up to 4,000 nm but the majority remain close to the area of release (see map below).

Water temperature restricts where a fish lives. While most fish are cold blooded— which means their body temperature depends on the surrounding water —tunas have a unique circulatory and respiratory system that allows them to regulate their body heat and move between warm shallow waters and cooler deep layers. Of all the tropical tunas, bigeye has the greatest capacity in this area and so can inhabit deeper and cooler waters. Once a fish's temperature requirements are met, it is the availability of food that limits its distribution. The same is true for bigeye. Temperature also regulates spawning. Bigeye spawn in temperatures above 26°C. A mature bigeye may spawn every two days, and produce around two million eggs each time.

Bigeye don't just migrate from one area to another, they also display remarkable vertical migrations. During the day, a bigeye will dive down to depths of 400 to 600 meters, exploiting

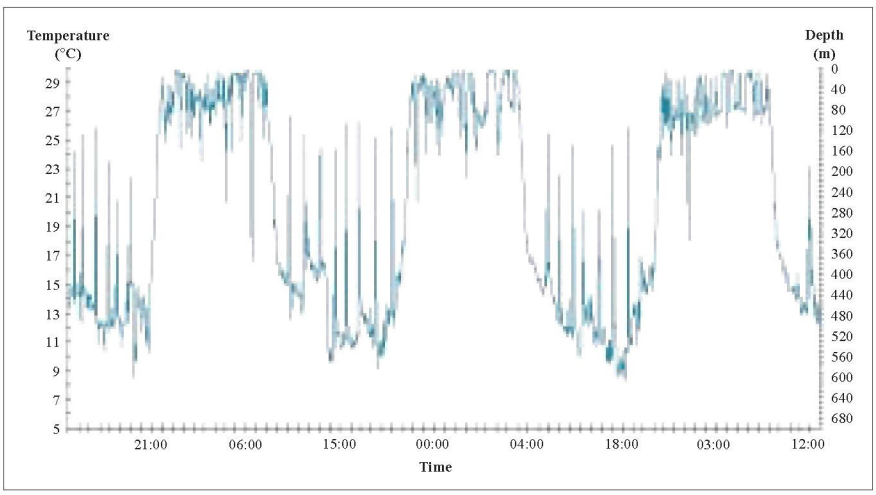


Movements of recaptured bigeye with distance from release point > 200 nm

(*RTTP ≈ 1989 – 1992)

a variety of habitats and reducing its exposure to predators such as marlin. They will, however, make a few trips during the day into shallower waters to warm up. After dusk, bigeye swim back into shallower waters to feed. Some evidence suggests that bigeye might be inclined to stay in the upper layers for several days at a time, as the full moon approaches, but this evidence is inconclusive.

How abundant are bigeye in the Pacific Ocean? This question is currently commanding much attention from tuna scientists, and to address it they must know how many bigeye are being caught. An important aspect is documenting the catch of purse-seine vessels on log and Fish Aggregating Devices (FADs). This is a large area of concern for scientists, as increased targeting on log and FAD sets may be putting increased pressure on the bigeye stock. Observers are in a *unique* and *valuable* position when it comes to shedding light on this work. Observers are the most reliable source of information when it comes to estimating the percentage of each tuna species in the purse-seine catch and providing valuable length-measurement data. Of course, port samplers can provide the same data and often do, but at times others factors interfere with their work (for example, well sorting and the difficulty in identifying frozen and misshapen fish).

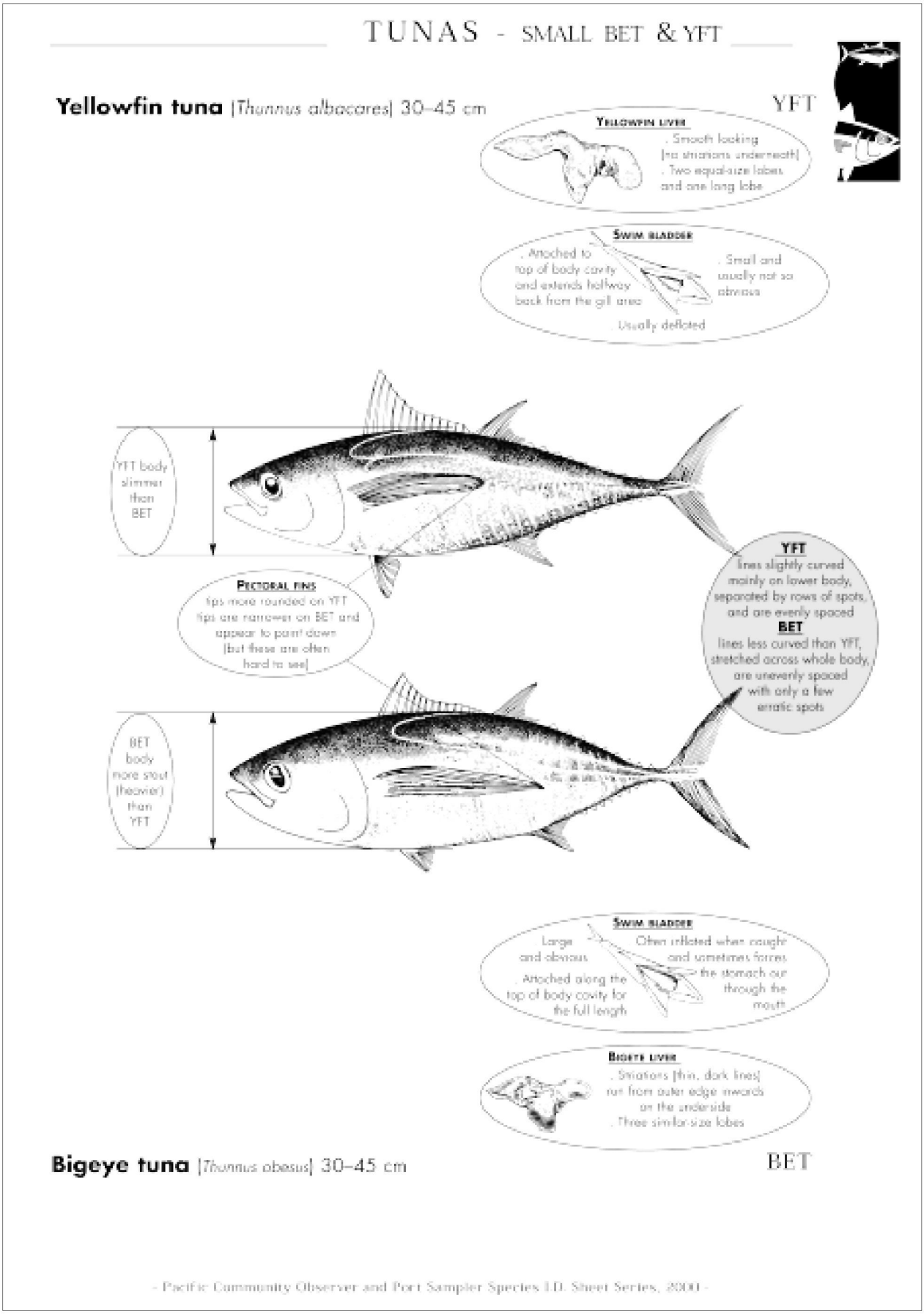


A three-day segment of the depth record (right axis) showing classical bigeye tuna vertical behaviour

Juvenile bigeye (above) and juvenile yellowfin (below)

Realising what an important role an observer has to play, it is worth paying extra attention to the job to ensure the data are collected correctly. The main hurdle, especially for the new observer, is distinguishing between juvenile yellowfin and juvenile bigeye. Although this issue is addressed at observer training, only experience gives the observer the confidence they need to distinguish the two species. A new observer should always go onboard with a picture of a small yellowfin and small bigeye in their folder. When the purse seiner makes a set on a log or FAD, there is always plenty of time, while the vessel is stacking up the net, to remind yourself of features of each species and to get a good clear picture of the different body shapes.

On page 6, an extract from SPC's species identification sheets shows some of the important aspects to look for.



Small yellowfin (YFT) and bigeye (BET) worksheet

The job of an observer onboard a purse seiner becomes easier, once you know the difference between the two species. Don't forget to note any discarded fish and the reason why they were discarded, such as gear damage, a fully loaded vessel or undersized fish.

Looking for something else to do? Checked for tags? There are still bigeye swimming around that were tagged during the RTTP from 1989 to 1992. A total of 146,633 tuna were tagged with ordinary dart tags. Of these, 8,074 were bigeye. Although the recovery rate has slowed considerably, it is not inconceivable that more will be recovered by observers. Complementing these are another 17,433 tags that have been released by the Hawaiian Tuna Tagging project (HTTP) before April 2000. Of these, 9,391 were bigeye. The majority of these fish would be expected to stay in the area of release, but some may travel great distances.

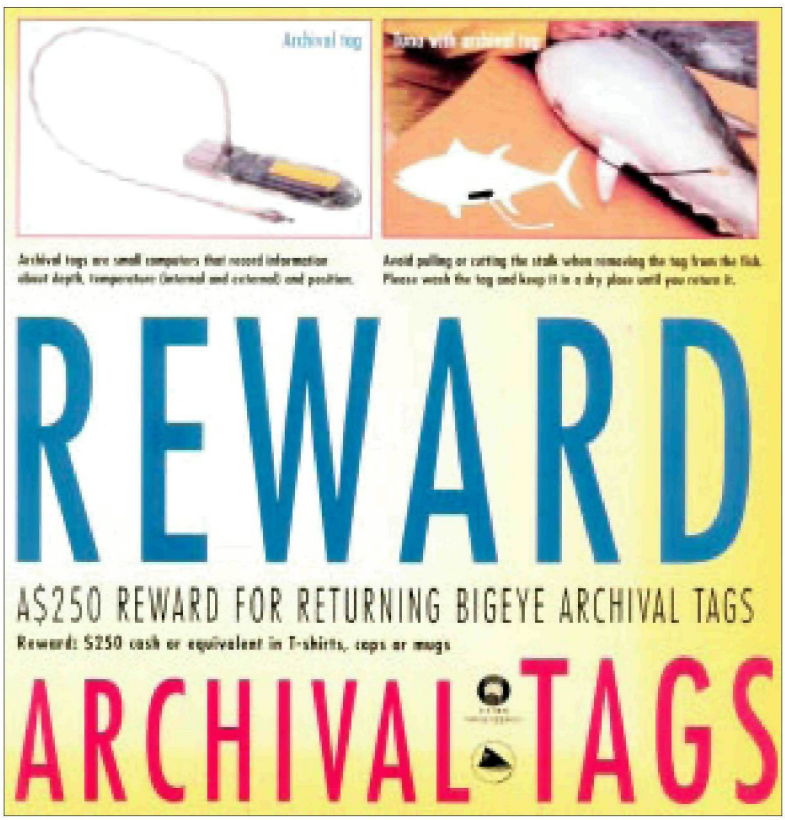
In addition to the normal tags, the SPC and the Commonwealth Scientific and Industrial Research Organisation (CSIRO) have recently put some 100 archival tags into bigeye off the east coast of Australia. Another 100 tags will be deployed before the end of 2000. These tags command a healthy reward of A$250. The HTTP has also deployed 77 archival tags, with a reward of US$500. Electronic tags record the temperature of the fish and the water, the depth and the geographical position of the fish.

This gives valuable insight into the behaviour of bigeye. These tags have a high reward value. Although the reward is payable to the fisherman or the person who locates it, observers should not hesitate to record the details of any tag they see coming on board and forward it to the relevant authorities.

If the fisherman fails to return the tag, or records some of the details incorrectly, the observer's record will become an important piece of information. The reward may not be forthcoming without the actual tag; however, if there is an extra cap or T-shirt hanging around, the authorities are sure to be obliging.

Finally, although work on the diet of bigeye is in its preliminary stages and identification guides for stomach contents have yet to be produced, it is worthwhile for observers to familiarise themselves with such work. Have a look to see what sort of prey items the bigeye has been eating (for example, squid, shrimp, small bony fish). Is the stomach full or empty? Does it make any difference when or where you sample? For example, do you notice any difference between an early morning or afternoon set, or does the type of set school (log/free) matter, or the area they fish in. These are the sort of things that scientists are interested in. The same applies to longline sets.

Mentioning stomach contents in one paragraph and then writing a sentence on the joys of a big plate of bigeye sashimi may stretch your visual imagination a little, but such is the life of an observer. One minute you're sampling, the next minute the meal is served. And if there was some shark-damaged bigeye that day, you might get lucky. Watch out for the wasabi sauce!



SPRTRAMP Observers

It's over! Five and a half years later, the four SPRTRAMP observers have finally hung up their callipers, washed the last of the fish scales off and are gently returning to life on dry land — life without copious quantities of raw fish and plain rice.

A motley crew with nothing more than their EU/ACP passports and previous observer/tuna experience to bind them, they embarked on a mammoth task: providing the baseline data on catch and by-catch for all fishing fleets, gear types, and nationalities that sail the western and central Pacific. Cultural and culinary challenges aside, they had their work to do. And once they settled into their bunk (or floor-space!), flicking the cockroaches aside, they prepared themselves for the daily challenges.

Knowing what the day would bring was like pulling straws. A short straw day was one on a Japanese longliner, or any other longliner that was brazen enough to set over 3,000 hooks in Pacific waters. Those days were long — 20 consecutive hours were often insufficient to monitor all hooks. On a Chinese vessel, where less than 1,000 hooks were set, the challenge was to keep oneself stimulated and healthy on a fleet that interfered with more observer immune systems than any other. But long straw days came about too. How about a day's steam across a calm sea, onboard an American purse seiner, with nothing more to do than prepare for a late afternoon high ball?

All objectives were met. It took 2,570 sea days and 151 trips to complete. During that time they monitored over 1.3 million longline hooks and 26,000 metric tons of purse seine tuna landings. With this work they have provided valuable insight into both the type and the amount of by-catch species landed by these vessels, their discarding practices and their fishing techniques. Additional agendas, the other bits and bobs, meant just as much: interpreting how vessels filled in their log sheets, providing feedback for the development of the new observer data form and even just adding to the photograph album of SPC. Who knew that they would find soapfish in New Caledonia, frostfish in Tonga and gemfish everywhere? But now we do.

The all star line up was Siosifa Fukofuka (Tonga), Filipe Viala (Fiji), Juan Jose Areso (Spain), Deirdre Brogan (Ireland) and Manasseh Avicks (Solomon Islands).

The "dream team": from left to right, Filipe Viala (Fiji), Juan Jose Areso (Spain), Deirdre Brogan (Ireland), and Siosifa Fukofuka (Tonga)

Siosifa thundered ahead, with day after day spent at sea, on one vessel after another. His consistent, easy-going style paid off in the end, when he topped the number of days spent at sea. The rest struggled to keep up, but despite all the moans, completed sea days mounted, initially into the hundreds and finally into the thousands.

The world is a better place with all of Filipe's efforts. Never losing his mischievous Fijian smile, he brought good cheer and God's word to many a vessel. Loaded down with give-away bibles, his excess baggage receipts were legendary. And now as the project winds down, rumour has it that Filipe is giving up neither his love of God nor the sea. We wish him luck with both.

While Filipe was loaded down with bibles, his Spanish colleague, Juanjo, preferred dictionaries. He had them all, Spanish-English, French-Spanish, English-Japanese, English-Chinese. In the beginning he thought the Aussies, Kiwis and Yanks were all speaking different languages, but he finally got the hang of the English language — even if he does speak with a quaint Asian touch "you me go disco now". In October 1999 Spain decided they wanted Juanjo back, re-installing him on a group of idyllic tropical islands—Seychelles in the middle of the Indian Ocean to work with the Spanish purse-seine fleet.

Some eyebrows were raised and disbelief expressed when the only female observer, Deirdre, came aboard. The vessel captains often flapped their arms and were heard to say "Where sleep?" or even "No lucky". Despite all the noise, however, all her trips were successful ones and three vessels actually broke personal catch records with Deirdre onboard. It does seem polite, though, to forget the one vessel that actually landed up on a reef!

In January 2000, a fifth observer, Manasseh Avicks from Solomon Islands joined the team, replacing Juanjo. As we write, Manasseh is still unpacking from his first adventures at sea under the SPC flag. His computer smells like a fish, his luggage is still somewhere between Vanuatu and New Caledonia, but he is content to have completed the work.

Other national observers also benefited from European funding, and made a trip or two with SRPTRAMP funds. These were: Luciano Aderiano (Palau), Fredrick Austin (Solomon Islands), Tino Debrum (Marshall Islands), Martin Finau (Tonga), Martin Jasper (Solomon Islands), Tamuera Tebao (Kiribati) and Marsh Uele (American Samoa). Finally we would like to mention one exceptional observer Ambrose Orianiha (Solomon Islands) who clocked 149 days on a Taiwanese longliner. This is the longest longline trip ever done by an observer in the region. So congratulations to Ambrose for completing that one. Ambrose managed another 49 days on a shark longliner vessel before funding finally ran out.

Although the SPRTRAMP project is over, there continues to be a need for experienced observers in the region. SPC and FFA are now looking at ways to increase the pool of experienced observers in the region. No funding for further training has been located, yet, but one thing's for sure - the title of 'experienced observer' is a well-earned honour.

Manasseh Avicks (left) and Ambrose Orianiha (right), from Solomon Islands.

First Aid - Loss of consciousness

1. Turtles

Take care! Turtles that arrive to the boat lifeless may not be dead. They may just be unconscious. If they are returned to the water before they recover, they will drown. Here are a few hints to aid an unconscious turtle. Remember, if a turtle is active when landed, it should immediately be returned to the water, with the boat engine in neutral if possible, and without dropping it on deck, *(Figures 1-3).*

If not active;

Keep the turtle on board *(Figure 4)*

a) Raise the rear flippers about 20 cm off the deck (to drain its lungs);
b) Keep it shaded and damp; and
c) Allow it to recover for up to 24 hrs.

If the turtle does not become active, it is probably dead, *(Figure 5).*

2. People

A common on-board injury is a direct hit to the head, which can lead to unconsciousness.

Signs and symptoms

- Mild mental confusion
- Brief loss of memory
- Difficulty with vision
- Headache
- Nausea (feeling sick)
- Irritability (sometimes)

Treatment

- Keep the patient resting and quiet;
- Do not give alcohol, medicine to relieve pain or sleeping pills; and
- Transport to a hospital as soon as possible.

(Source: (1) Circle of Dependance. Protected Species Handling Manual. Ocean Watch .(2) First Aid: For Community Health Workers in Developing Countries. Muriel Skeet)

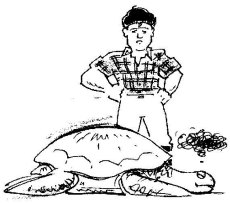


Figure 1

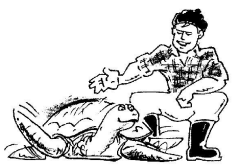


Figure 2


Figure 3

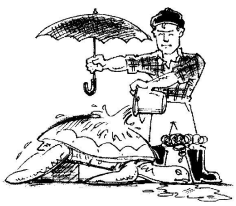


Figure 4

Figure 5

Sunfish goes on holidays

Seen a large ocean sunfish lately? Well, watch out, it may grow bigger. Looks like this impressive fish relishes the chance to be a couch potato. In August 1997, a 58 pound (26.3 kg) sunfish was caught and put on display in the Monterey Bay Aquarium, California, U.S. Within 15 months, the fish, fed on a diet of hand-fed squid, shrimp, pureed fish and nutrient-enriched gelatin, ballooned into an 880 pound (≈ 400 kg) giant. The fish was eventually released.

(Source: National Geographic: Vol. 195, No. 3)

Sunfish arrives onboard the Navimon longliner, F/V Keitre.

Summary of Size Data Collected by Port Samplers in the Region During 1999 (provisional)

Country	Port	Gear	Size Sampling						
			Vessels	SKJ	YFT	BET	ALB	OTH	TOT
FSM	CHUUK	L	39	...	1,259	1,498	...	90	2,847
		S	...	...	...	...	...	...	...
	KOSRAE	L	51	1	3,893	3,214	2	88	7,198
		S	...	...	...	...	...	...	...
	POHNPEI	L	53	...	3,895	4,551	19	499	8,964
		S	...	...	...	...	...	...	...
	YAP	L	...	...	...	...	...	...	...
		S	...	...	...	...	...	...	...
	TOTAL		143	1	9,047	9,263	21	677	19,009
FIJI	LEVUKA	S	1	628	275	47	...	...	950
	SUVA	L	52	...	4,010	3,364	5,017	616	13,007
	TOTAL		53	628	4,285	3,411	5,017	616	13,957
MARSHALL ISLANDS	MAJURO	S	70	133,689	51,932	3,815	...	34	189,470
NAURU	NAURU	S	...	...	...	...	...	...	...
NEW CALEDONIA	NOUMEA	L	12	...	6,205	2,305	23,053	5,263	36,826
PALAU	KOROR	L	206	...	21,038	30,480	389	3,623	55,530
PAPUA NEW GUINEA	RABAUL	S	...	...	...	...	...	...	...
	WEWAK	S	5	565	532	103	...	...	1,200
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
	TOTAL		282	12,061	11,496	1,140	44,685	6,518	75,900
SOLOMON ISLANDS	HONIARA	L	10	...	5,748	4,768	63	202	10,781
		S	3	184	246	20	...	...	450
	NORO	P	21	22,672	3,012	...	...	...	25,684
	TULAGI	P	5	724	461	...	...	...	1,185
		S	3	1,401	1,026	5	...	...	2,432
	TOTAL		42	24,981	10,493	4,793	63	202	40,532
TONGA	NUKU'ALOFA	L	11	50	272	833	3,144	735	5,034
TOTAL			**824**	**171,975**	**115,300**	**56,143**	**76,372**	**17,668**	**437,458**

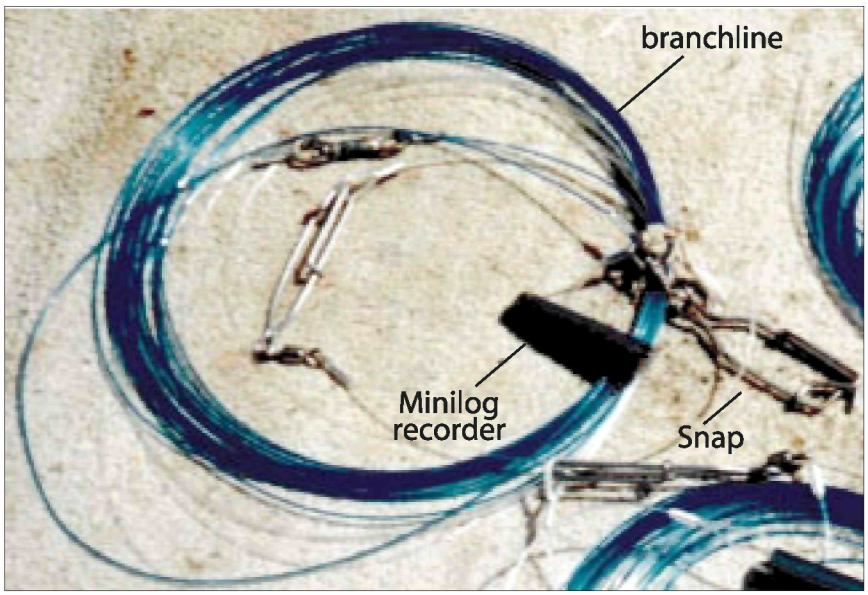
(L = longline; S = purse seine; P = pole-and-line)

Welcoming some brand new Port Samplers from Nauru

From left to right: Jim Morbit, Gaiman Denuga, Junior Taleka and Hudson Agadio, who recently underwent some port sampling training in Nauru to cover the occasional purse seiners that off-load there.

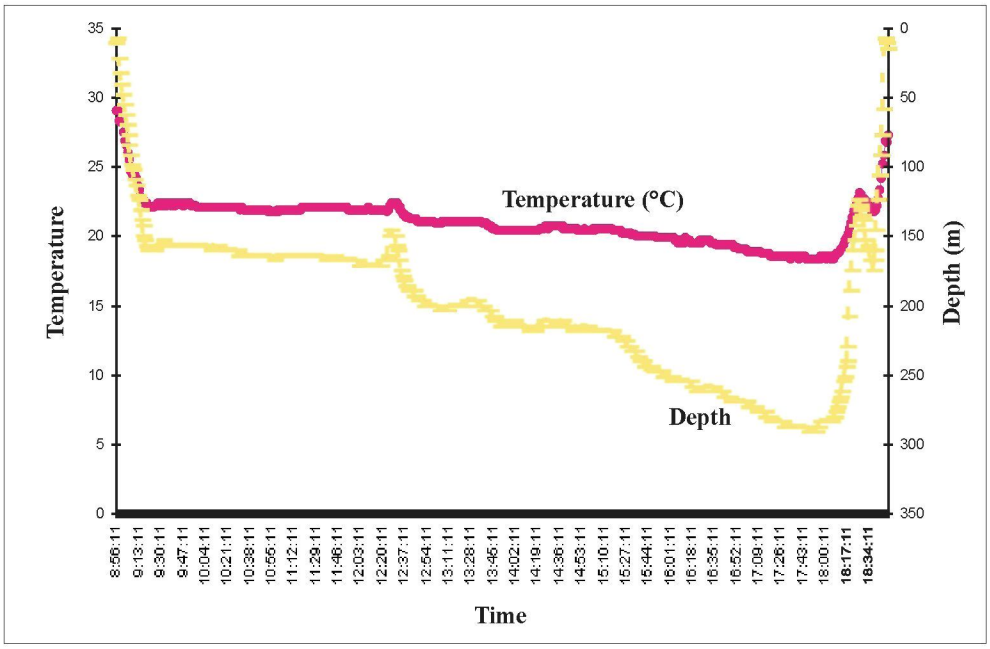
Introducing the Minilog

SPC has recently taken delivery of four sets of temperature depth recorders (TDRs), also known as Minilogs. Attached to the end of the branchline – in place of the hook – they can tell us what depth the hooks have reached.



The Minilog recorder attached to a branchline

They also record the water temperature. They are easily deployed – snapped to the mainline just like a regular branchline. The information is downloaded to the computer at the end of the haul. Knowing the depth and the temperature the line is actually fishing at is valuable information for scientists. Fishing captains also show a keen interest in this type of intelligence and are often anxious to take an observer, with this equipment, out fishing.



Graph of an actual Minilog recording from a domestic Polynesian longliner. From the graph you can see that the TDR was deployed at approx. 09.13 hrs and hauled at approx. 18.17 hrs. Although it is not always easy to interpret these graphs it is likely that the jump in the depth at 12.20 hrs comes from the capture of a yellowfin on the next hook. The line is much deeper near the end of the haul. This is probably due to strong currents but the weight of the dead yellowfin on the following hook may also have contributed.