

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 #1 — October 1999

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Welcome to *Fork Length*, the Pacific's first regional observer and port sampler newsletter. Things have been hotting-up in the observer and port sampler worlds in the last few years, and it is hoped that this newsletter will fuel the process even further. Right now there are three regional observer programmes (the Federated States of Micronesia (FSM) arrangement, the Secretariat of the Pacific Community and United States Multilateral Treaty) and three national programmes (FSM, Papua New Guinea and Solomon Islands) up-and-running, with the Marshall Islands also trying its hand. Perhaps Fiji and Palau are soon to follow suit. These programmes employ approximately 100 observers as well as 30 port samplers in 25 ports across the region.

As we head into the 21st century it is worth noting that observing in the Pacific has also come of age. It is 21 years since the Pacific's inaugural trip by an FSM observer. We feature FSM's observer programme here and hope to feature other observer programmes in future issues. Some of the other things we hope to highlight in this occasional newsletter will be summaries of the number of observer trips by each programme, as well as summaries of port sampling data completed and submitted to SPC. We will mention any changes in sampling strategies, things to look out for and other modifications as they happen.

Still, observing and port sampling are not just about measuring fish. We expect that our articles will reflect on the broader life experience of observers and port samplers. For this reason, we encourage contributions from everyone working in the field. If you have any stories, photos, questions or ideas please send them in. Let your voice be heard! The emphasis of this first newsletter leans more towards observing than port sampling, but we haven't forgotten the port samplers. The imbalance will be redressed in future issues.

Please let us know if you enjoyed *Fork Length* and if you have any views on how we might improve it. Remember to get your comments in before your ship leaves shore.

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MMA Observer Programme

Somebody has to be first and when it comes to observer programmes in the Pacific the Federated States of Micronesia's (FSM) observer programme claims most of the awards. Set-up in 1979, the same year that the United Nation's 'Law of the Sea' gave not only sovereignty to the country over its 200 nm EEZ but also the impetus to manage its resources properly. The programme has been running strongly ever since.

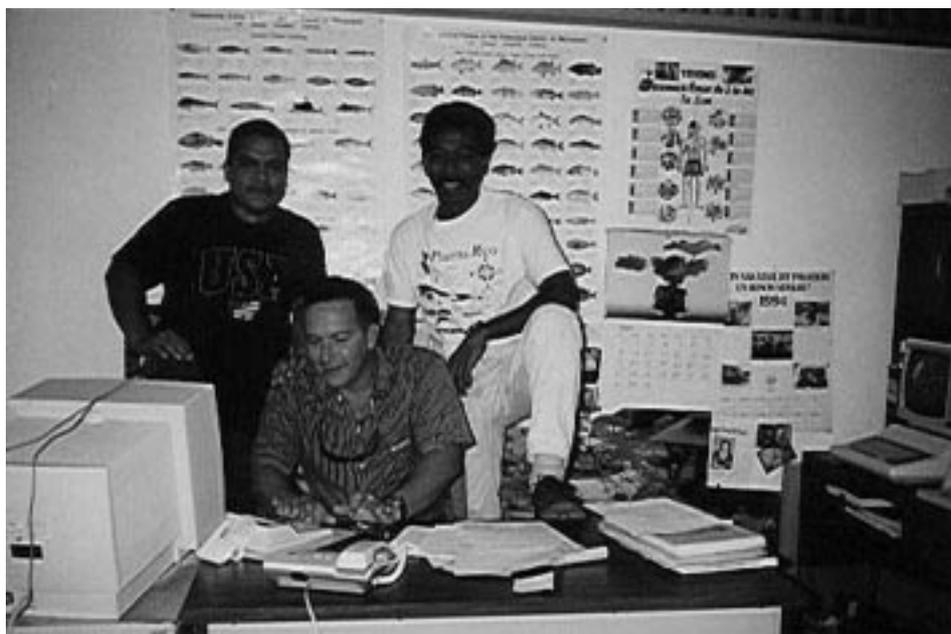
Ben Hallens bravely sailed the first voyage, and for a while his efforts were complemented by only a handful of scientists, consultants and FSM nationals who fancied their chances. But by mid 1992, the programme had expanded considerably, in line with the corresponding rise in vessel numbers and gear types exploiting FSM's rich resources.

Presently the Micronesian Maritime Authority Fisheries Observer Programme (MMAFOP) is supervised by Tim Park, MMA's Australian Tuna Biologist, and Donald David, the Assistant Biologist who hails from Pohnpei's Mokil Island. Observer numbers fluctuate. Over the years, 27 names have touched the roll call but 12 is the current operational figure. The supervisors manage the constraints of time and budget against the ever increasing needs for good coverage. The

MMAFOP is funded directly by contributions from vessels. An observer fee is paid as part of the license fee.

To gain a better insight into how the programme operates, we discussed some of the issues with one of the supervisors, Donald David. Donald, after graduating from the College of Micronesia spent some time with Pohnpei's Marine Resource Division before taking up the position of Assistant Fisheries Biologist. With six years of experience he is now a valuable player in the observer programmes of the Pacific. Recruiting, training and placements are all part of Donald's portfolio.

Typically a new recruit will go through one week of intensive one-to-one training before he is ready to board his first boat. That first trip will probably be on a longliner, as the trip is shorter and the range of species greater. At MMA all observers are briefed before going to sea and more importantly all observers (apprentices and old hands) have their data checked as soon as they get back from sea. Here the supervisors get the chance to check that the data are complete and errors are rectified before the observer goes back to sea again. Not all new recruits are suitable for the job. Some just don't like the job



From right to left: Donald David, Tim Park and Paulino James in the office at MMA, August 1999

and leave of their own accord. Others get lazier as time goes by. Offences such as turning up to a vessel drunk or directing a vessel back to harbour without reason are not tolerated and employment is terminated.

It is no surprise that Donald claims the most difficult part of his job is getting the placement organised. The three most common excuses given by vessels that reluctant to take observers are:

- ☞ The boat is going to dry dock (MMA will immediately board an observer when this vessel returns to any of FSM's ports);
- ☞ No space (the vessel is given the chance to transfer one crew member during their next trip; Once they return to port boarding procedures are attempted again);
- ☞ No response to the request (if a company fails to respond to faxes and phone calls, persistence and experience will usually reveal the correct contact and this problem diminishes over time).

MMA's tough stance is now respected and most vessels willingly comply. There is no record of physical abuse to any MMA observer but at times access to the bridge is denied or other infringe-

ments happen. Such incidents are noted and highlighted at the annual licensing negotiations.

One of MMA's longest serving observers is Paulino James, who worked with the programme from 1987 until 1997. After taking a few courses at the University of Guam, Paulino heard about the observer positions and was interested in applying.

The first hurdle to overcome was the presence of a close relative in the Director's chair. Paulino's interest in the job was thwarted for fear of nepotism. After many attempts the Director finally relented and Paulino joined the team. In those days instruction took place alongside Australian and New Zealand observers who were being trained to board foreign boats in their own waters. Today the records show that Paulino has more than 33 trips to his credit, clocking up an admirable 1,352 days at sea (and he reckons a few more may have eluded the database). His shortest trip was for only one day, the longest 99. Paulino enjoys observing; when urged to highlight any quibbles he might have, his only thought is that observers should be paid per diem in advance to alleviate the problem of unforeseen periods in foreign harbours.

His fondest memories are from a trip on board a Japanese purse seiner, *Hakko Maru #27*.

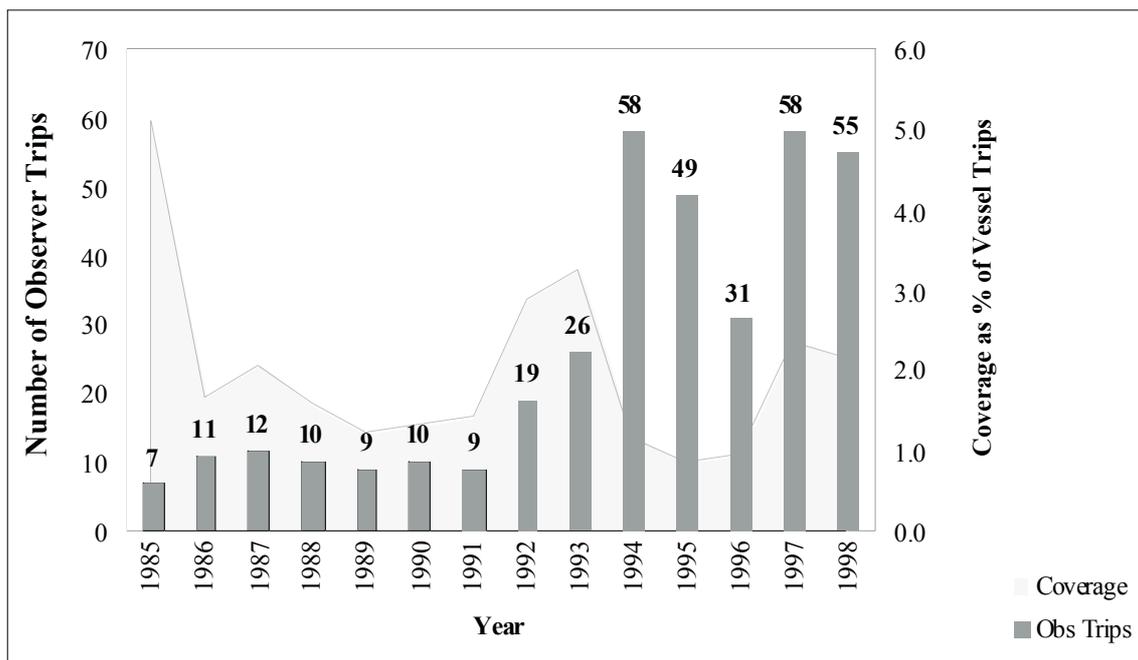


Figure 1: The MMA Fisheries Observer Programme: number of placements and percentage coverage

Lounging around the galley one day he was abruptly called to the bridge. Handed a pair of binoculars, the lenses soon filled with the evidence. A naked man, burnt and skinny was drifting in his small canoe. Fresh turtle shells, a half side of a grey shark, an old blue helmet, some fishing lines, a knife and a gallon container with the last mouthful of water surrounded him. The four horsepower Evinrude outboard motor was still in place.

Many an eye widened as he climbed aboard. And in the words of Paulino, he had 'one of the flattest ...' imaginable. He became the responsibility of the observer. Further shocks were to come as a 'cigarette!!' was his first request. Despite his ordeal he was forced to take some milk and watery rice

before he was allowed this ultimate desire. With his strength gone, the cigarette managed to knock him out for over 30 minutes. Paulino dealt with the faxes from Japan, Kiribati and MMA before finally alighting with the castaway at Guam. From there, all expenses for the super hero were taken care of by the Japanese agent.

Nowadays events like this are little more than memories for Paulino, who has been requested to fill the Statistic Specialist II position at MMA. He now looks after things like zone entry reports (ZENT). Still, he longs to get back to sea.

He has no qualms stating that observing is one of the best jobs he has ever had.

Paulino is not the only observer to have come across castaways while at sea. We know of two others. Perhaps there are more. As with Paulino, if only because they spoke English, the care of the castaways was left to the observers.

Caution should be exercised in trying to reverse either dehydration or malnutrition. SPC's own recipe for rehydrating is: 4 cups of boiled water, a quarter teaspoon of salt, 2 teaspoons of sugar in quantities that will produce a urinary output of 1 litre per day initially. In tropical climates this will be more than 2 litres per day. Only a diet of nourishing liquids (sugar with water / milk/ soup) should be given in the first two days. Then small amounts of food can be given. Radio medical advice should be sought.

Observer work gets results

And you thought you'd never see the day. Sent off to sea with a bottle of alcohol in hand, supplied by the observer programme. No, it's not a dream, supplementary sampling is an integral part of observer duties. Requests for 'bits and pieces' from fish are constantly coming in from scientists. With ziplock bags, vial, knives, formalin or alcohol (albeit a cupful if you are lucky !) all in tow, sampling proceeds.

One such sampling effort that was region-wide was David Itano's (University of Hawaii) study on the reproductive biology of yellowfin tuna in relation to fisheries.



Over 30 observers from the Forum Fisheries Agency, the Micronesian Maritime Authority and the Secretariat of the Pacific Community collected samples during the study period (May 1994 to April 1996).

The results addressed the when, where and how of spawning. It seems yellowfin are fussy fish who prefer their spawning to be conducted during late night hours (2200 hrs to 0300 hrs) and a nice, warm ocean is essential (above 24°C). When they do spawn, they shed on average 2.2 million to 2.9 million ova (eggs). Yellowfin, within 10 degrees of the Equator, will spawn on average every two days. The further they move from the Equator, the more seasonal spawning becomes. Fifty per cent of yellowfin are mature at 104 cm and so they can commence spawning. The other fifty per cent mature at a slightly longer length.

Dark nights and warm baths are one thing, but the study also found that the presence or

absence of food and particularly the oceanic anchovy (*Encrasicholina punctifer*) is one of the main factors driving spawning in yellowfin. It provides the energy for both maturation and for maintaining their peak spawning condition. Dave Itano, who expresses his gratitude to the

observers for all their samples, has now taken to the high seas himself, sticking yellow, green and orange tags marked 'Hawaiian Tagging Project' into both yellowfin and bigeye tuna. If you find one, please send it back to Dave. As they say in Hawaiian, Mahalo - Thank you.

Magnificent marlin

'Then the fish came alive, with his death in him, and rose high out of the water showing all his power and his beauty. He seemed to hang in the air above the old man in the skiff. The he fell into the water with a crash that sent spray over the old man and over all of the skiff'. From Ernest Hemingway's novel, *The Old Man and the Sea*.

There are few fish as magnificent as the marlin. The power and the beauty of the animal grabs the imagination as it jumps, twists and fights at the end of a line. Possibly the fact that there is still more to learn about the marlin in the Pacific adds to their allure.

In the Pacific there are three species of marlin; the black (*Makaira indica*), the blue (*Makaira mazara*) and the striped marlin (*Tetrapturus audax*). While their biology, morphology and habitat are similar, differences do occur. Marlins are epipelagic (upper layers) fish enjoying remote oceanic waters. It is rare to find either the blue or striped marlin close to a landmass, although the black marlin can be found closer to shore off Australia and PNG. Marlins occur throughout the tropical and subtropical areas of the Pacific. Of the three the blue marlin is the most tropical while the striped marlin extends into more temperate waters. All marlin are highly mobile and can carry out long-distance migrations, although we have yet to obtain a clear understanding of their seasonal movements.

Marlins mature at around four years of age and can live past 30 years. When spawning they can produce up to 200 million eggs. Both black and blue (not striped) marlins are sexually dimorphic, with the females growing larger than the males. Growth rates for marlin have been studied by various organisations but still require refinement. The maximum recorded lengths attained by these species are 450 cm for blue, 350 cm for striped and 448 cm for black (all lower jaw to caudal tail measurements). Marlin use their long spike to stun and injure prey. Their diet includes scombrids (tuna like fish), trevallys, squid, lancetfish and even the occasional bird.

For the observer, especially an inexperienced observer, identification between the species can be difficult. Some of the main features to look out for are:

- ☞ Black marlin: the front of the second dorsal fin is in front of the second anal fin and the pectoral fins cannot be folded down along the body in fish over 120 cm.
- ☞ Striped marlin: The dorsal fin height is approximately the same as the body depth (often with a rounded tip). It looks skinny in cross section and has a slight orange tinge to the flesh.
- ☞ Blue marlin: The dorsal fin height is shorter than the striped marlins. It is only about 2/3 the body depth.

(See figure 2 for details)

But species identification is not the only thing to challenge the observer. Identifying the gonads in billfish is difficult for someone who has only trained on tuna-like species. The first challenge is the male gonad (testes). These are often 'glued' to the back of the body cavity and at times to the flotation bladder (that big bunch of bubbles!). They may be pale to pinkish in colour. Testes can be quite long in length, often extending down most of the body cavity, while the ovaries do not extend as far forward.

The external appearance of the testes also comes as a surprise to the untrained eye, having a rough rather than a smooth surface: 'brain-like' is one description. Like most testes, a cross section is quite revealing, sperm should be easily

seen on examination. Ripe female gonads (ovaries) should be easily identified. Immature ovaries are more difficult and are short and triangular to rounded in shape while immature testes are thinner and strap-like.

There is still a lot to learn about marlin in the Pacific, which is why observers should be careful in their observations of these species. The recent recruitment of a dedicated billfish scientist at SPC (Wade Whitelaw) emphasises the importance of the work that needs to be done. Initially the position will look at improving the collection of billfish catch and effort data, for both the recreational and commercial fisheries. When was the last time you noticed a vessel reporting any of their billfish bycatch?

Reproductive habits are another area that will be addressed by the project. For this samples will be needed and who better than the observers to supply those needs! SPC observers have already started to collect dorsal spines for length-age studies. So maybe what drags you up from your lounging position during the observer day is not just another dead marlin. It's a fish with its own story to tell and the physical remnants of clues to its biology and those of its breed.

As an observer you will probably be the only one to ever record the details of that poor dead fish! One extra moment to get all the details and measurements correct makes all the difference. Then with the job well done, feel free to race back to your book, a Hemingway novel perhaps . . .

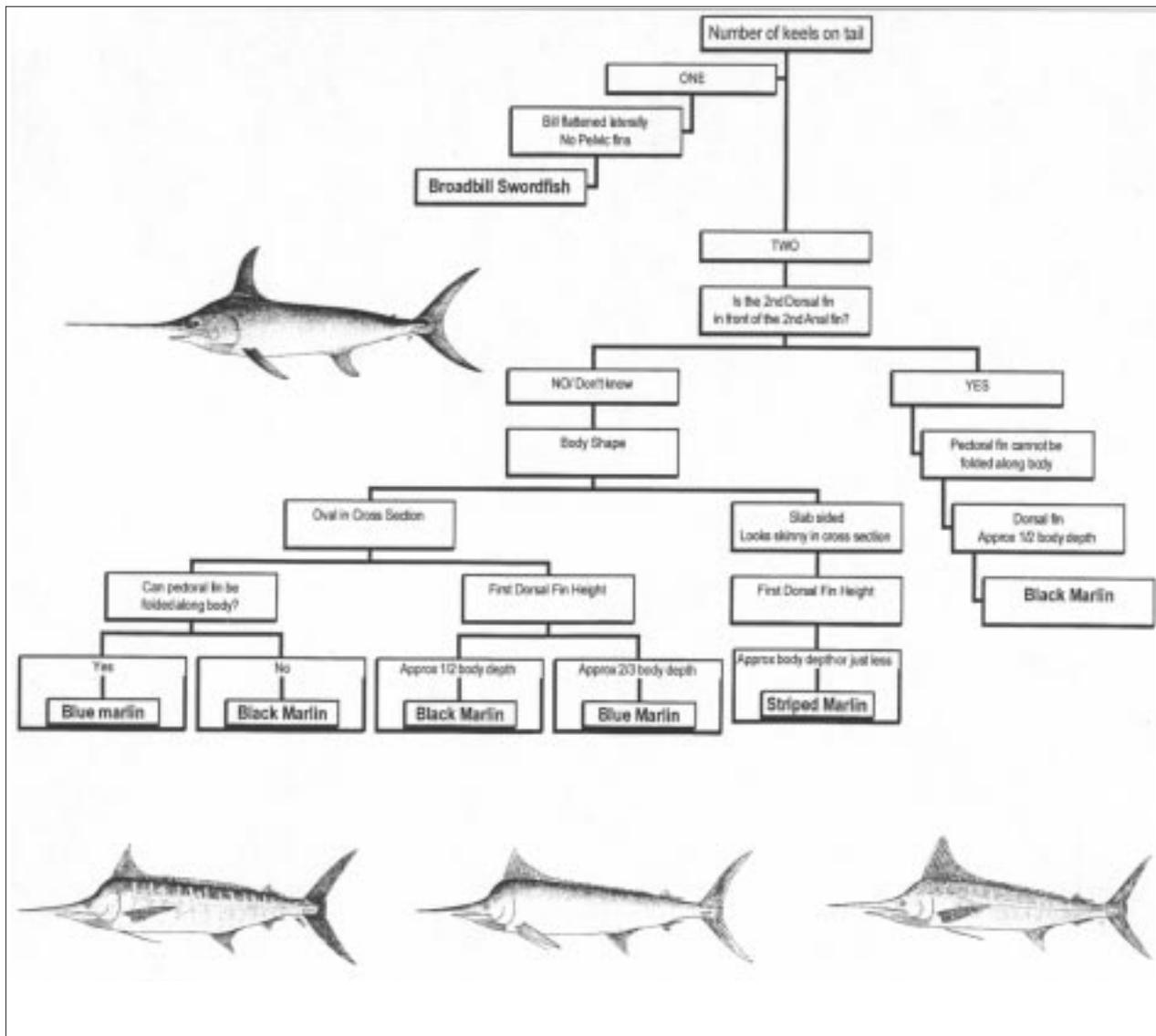


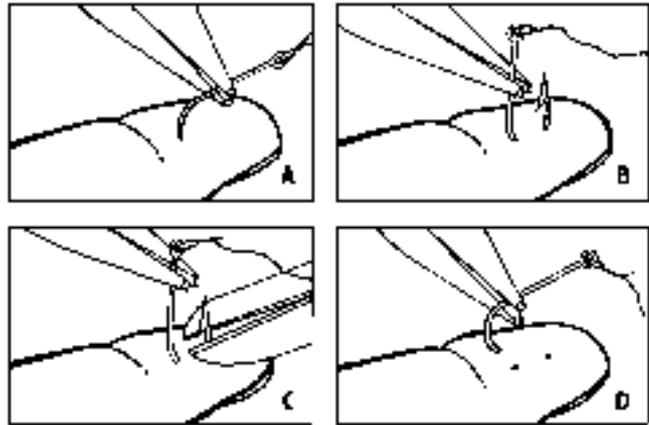
Figure 2: Billfish Identification

First aid

Flying hooks are one of the main dangers to avoid on longline vessels. If you, or a member of the crew get caught by one here are some hints on how to remove the offending article. Remember, you should not try to remove deeply imbedded hooks. Keep the area clean and bandaged. Medical attention should be sought as soon as possible.

To remove a hook:

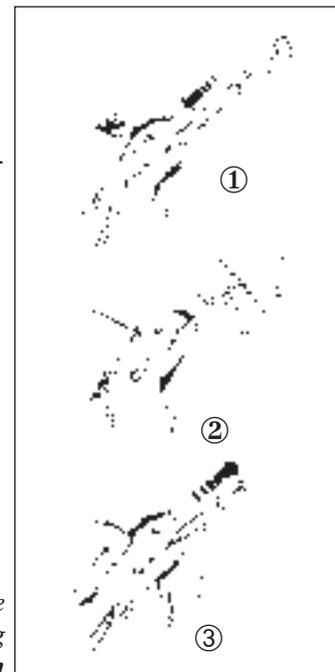
- Grab the shaft of the hook with pliers. (A)
- Turn the hook and push the barb out through the skin. (B)
- Cut off the barb close to the skin. (C)
- Extract the hook. (D)
- Clean the wound with soap and water.
- Avoid infection by cleaning the wound with soap and water AND
- See a doctor as soon as possible.



From: *Collins Gem: First Aid*

Hooked turtles

- If a turtle is hooked, pressure should be taken off the line and the animal brought on board the vessel if possible.
- If the hook has been swallowed deeply the line can be cut and the animal released, as the hook will dissolve.
- If the hook is in the soft tissues of the mouth it can be pushed through and cut off.
- If this is not possible then the line should be cut about 1 metre from the hook.
- Thread a 60 cm piece of thin piping or similar (conduit) over the line.
- Allow the conduit to slide down the throat of the animal until it rests against the hook (Figure 1).
- Hit the conduit sharply (Figure 2).
- Remove the hook (Figure 3).



From: *Circle of dependance (Protected Species – Handling Manual. Ocean Watch*

Unusual specimens

In August 1997, within the fishing grounds of the Marshall Islands, another shark landed on-board a Chinese longliner. None of the crew gave it a second look. Even the observer's glance as he reached for his callipers was casual. A large crocodile shark (*Pseudocarcharis kamoharai* {species code: PSK}) he reckoned. As he squared up to the shark he had to look again. Certainly it had the shape of a crocodile shark and the amount and angle of the teeth were also reminis-

cent, but something about the shark made him look again and reach for the fisheries ID book. Still unsure, especially as the identification guide says that the maximum length for a crocodile shark is 110 cm, he measured the shark, marked it 'PSK', noted his doubts, took a photo or two and got on with the rest of the trip.

Back at report writing stage the issue came up again. Most of the books were in agreement that

the maximum length for the crocodile shark was 110cm. So the answer lay further. The photographs the observer took did not show the position of the second dorsal fin very well which complicated things, but finally most people around agreed it must be the bigeyed sand tiger shark (*Odontaspis noronhai*). There were no reports of this shark sighted in the Pacific Ocean before, so things had to go further and expert scientific advice sought. It turns out the observer was right. It was a bigeye sand tiger and it had never been recorded in the Pacific before. Another small contribution to marine science.

For the new observer all fish are unusual specimens. As experience expands the number of unknown species an observer encounters will decrease, but even the most experienced observer must prepare for the possibility of encountering an unknown fish some day.

If the fish is not known or shown in your fisheries identification guide, there are two methods that can lead to successful identification. One is photographing the fish. The other is retaining the fish. You'll never know when an exotic creature is going to land at your feet, so remember to bring along a camera on every single voyage. Strange as it may seem, there is an internationally accepted method for photographing fish! Etiquette demands that the head points to the



Bigeye sand tiger shark, *Odontaspis noronhai*, which had never been recorded in the Pacific before

left (as you look at it). The only exception to this is if the fish is damaged on its left side. This may sound a little bit academic, but maybe some day your photo of a rare fish will be the only one on record.

Some other tips for taking photos at sea:

- Keep the sun behind you.
- Avoid mid-day sun.
- Watch out for shadows (especially your own) covering the fish.
- Use a contrasting background. Blue and green tarpaulins are recommended.
- Allow for some space around the fish if using a disposable camera (the view-finder is somewhat misleading).
- Place a ruler in the photo so the size of the fish can be gauged.
- Number the photo.
- Record details of the photo in your note book.



Two PNG Observers, Jacob Eddie and Charles Hitolo, hard at work on-board the Filipino purse seiner F.V. *Dolores 832*, May 1999.

What age is that fish?

Did you ever wonder about the age of that tuna you were measuring? Here are some of the results that were revealed by reading tuna otoliths at SPC.

Age	Length, with approximate weight	
	Yellowfin	Bigeye
6 months	47 cm, 2 kg	45 cm, 2 kg
1 year	68 cm, 6 kg	65 cm, 7 kg
2 years	117 cm, 31 kg	95 cm, 20 kg
3 years	135 cm, 48 kg	120 cm, 40 kg

- Please note these figures are approximations only. The results were presented at the Twelfth Meeting of the Standing Committee on Tuna and Billfish, Tahiti, French Polynesia, 16-23 June 1999.
- 'Preliminary results on age and growth of bigeye tuna (*Thunnus obesus*) from the Western and Central Pacific Ocean as indicated by daily growth increments and tagging data'. P. Lehodey, J. Hampton and B. Leroy. Working Paper BET-2.
- 'Age and growth of yellowfin tuna (*Thunnus albacares*) from the Western and Central Pacific Ocean as indicated by daily growth increments and tagging data'. P. Lehodey and B. Leroy. Working Paper YFT-2.



A few words in another language

English	Japanese
Hello	Konnichi wa
Goodbye	Say-o-nara
Please	Dozo
Thank you	Arigato
Yes	Hai
No	ie
I am hungry	Onaka ga ksuike imasu
Good	Ee
Bad	Wah-roo-ee
What time is it?	Nanji desuka
My name is...	... to moshimasu
Okay	Okay
Where is the...?	...ha Doko desuka
How are you?	Ogenki sesuka
Fish	Sakana

English	Korean
Hello	m-ni-da
Goodbye	An-nyong-hi ka-se-yo
Please	Ship-shi-yo
Thank you	Kam-sa-ham-ni da
Yes	Ye
No	a-ni-yo
I am hungry	Bae ko-p' a-yo
Good	Jo-hun
Bad	Na-ppun
What time is it?	Myot shi im-ni-kka?
My name is...	Je I-rum-un...im-ni-da
Okay	Jo-sum-ni-da
Where is the...?	...o-di-e iss-sum-ni-kka?
How are you?	An-nyong-ha-shim-ni-ka?
Fish	Mulgogi

English	Taiwanese
Hello	Ni hao
Goodbye	Zaijian
Please	Qing
Thank you	Xiexie
Yes	Repeat the verb
No	Bu "plus the verb"
I am hungry	Keshi wo jintian weikou tai hao
Good	Hao
Bad	Bu hao
What time is it?	Shenme shihou?
My name is...	Wo xing...
Okay	Hao
Where is the...?	...zai nar?
How are you?	Ni hao?
Fish	Yu

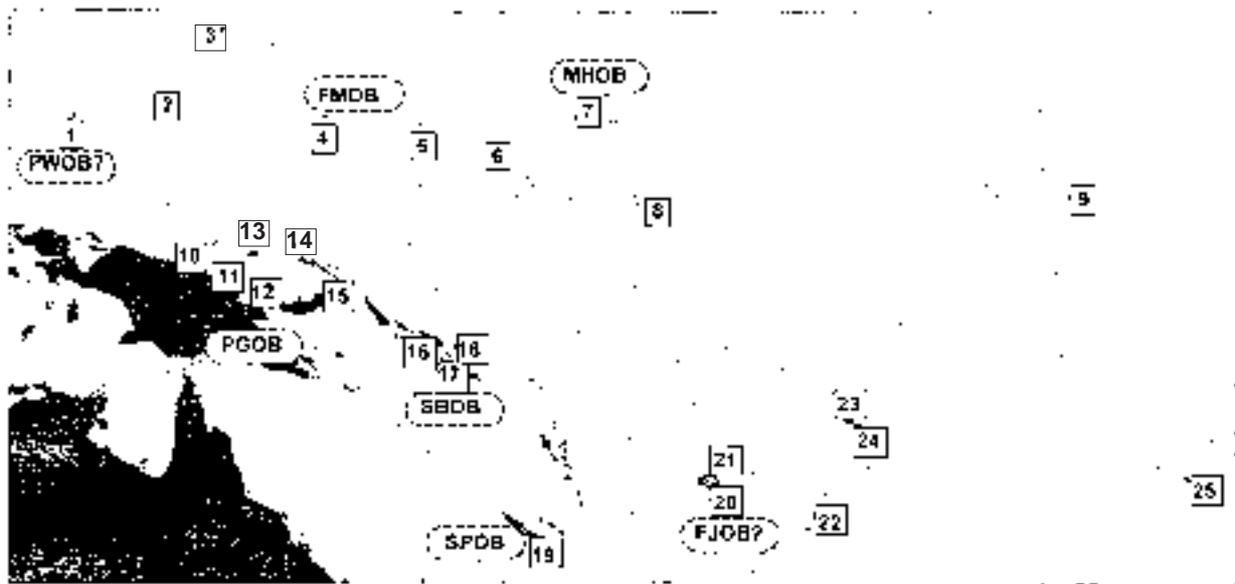
English	Indonesian
Hello	Halo
Goodbye	Selamak Jalan
Please	Tolong
Thank you	Terima kasih
Yes	Ya
No	Tidak
I am hungry	Saya lapar
Good	Baik
Bad	Tidak Baik
What time is it?	Jam berapa?
My name is...	Nama saya...
Okay	Baik
Where is the...?	Di mana...?
How are you?	Apa kabar?
Fish	lkan

Summary of data collected by port samplers in the region during 1998 (provisional)

Country	Port	Gear	Unloadings		Size Sampling							TOT
			Vessels	Trips	Vessels	SKJ	YFT	BET	ALB	OTH		
FSM	CHUUK	L	37	75	0	5,668	2,303	1	329	8,301		
		S	36	95	7	700	500	0	0	1,200		
	KOSRAE	L	52	271	46	6,168	6,096	2	489	12,755		
		S	10	13	0	0	0	0	0	0		
	POHNPEI	L	50	584	62	18,923	16,536	13	1,189	36,661		
		S	2	2	0	0	0	0	0	0		
YAP	L	4	4	1	47	114	0	0	161			
	S	1	2	1	63	32	0	0	200			
	TOTAL		192	1046	154	805	31,369	25,081	16	2,007	59,278	
FIJI	LEVUKA	L	33	48	31	0	0	7,014	0	7,014		
		P	1	12	0	0	0	0	0	0		
	S	4	7	0	0	0	0	0	0	0		
SUVA	L	20	72	25	7,752	5,558	7,563	702	21,575			
		58	139	56	7,752	5,558	14,577	702	28,589			
	L	9	47	12	103	77	73	257	510			
FRENCH POLYNESIA	KIRITIMATI	L	0	0	19	0	131	3,768	0	1	3,900	
		S	62	139	40	10,111	2,666	3	0	12,780		
	TOTAL	62	139	59	10,111	2,797	3,771	0	1	16,680		
MARSHALL ISLANDS	MAJURO	L	39	232	24	485	1,845	0	0	2,330		
		S	46	138	51	68,094	53,089	478	0	121,661		
	TOTAL	85	370	75	68,094	53,574	2,323	0	0	123,991		
NEW CALEDONIA	NOUMEA	L	10	216	10	4	6,387	3,690	18,042	4,475	32,598	
		L	52	107	141	0	25,375	16,402	126	3,552	45,455	
PAPUA NEW GUINEA	CARRIERS AT SEA (PH)	S	5	59	0	0	0	0	0	0		
		S	1	2	0	0	0	0	0	0		
	LAE	S	0	0	2	1,646	615	0	71	3,600		
		S	27	60	0	0	0	0	0	0		
	MADANG	S	9	25	11	1,788	1,247	115	0	3,150		
		S	42	146	13	3,434	2,515	730	0	6,750		
TOTAL		0	0	212	9,584	5,074	1,092	36,690	6,357	58,797		
SAMOA	APIA	L	0	0	11	0	2,628	3,707	4	214	6,553	
		S	41	120	51	6,504	9,140	247	8	15,899		
	TOTAL	22	752	21	29,356	5,020	0	0	0	34,376		
SOLOMON ISLANDS	HONIARA	P	5	15	6	5,352	3,498	0	0	8,850		
		S	3	46	4	1,879	21	6	0	3,785		
	TOTAL	71	933	93	43,091	22,165	3,975	18	214	69,463		
TONGA	NUKUALOFA	L	8	56	4	402	271	1,536	246	2,461		
TOTAL			589	3,199	829	135,129	157,513	62,970	71,078	17,882	444,572	



Location of unloading ports with port sampling activities and observer programmes



Unloading ports (port sampling activities are marked by squares)

- | | | | | |
|-------------|----------------|--------------|--------------|----------------|
| 1.- Palau | 6.- Kosrae | 11.- Madang | 16.- Tulagi | 21.- Levuka |
| 2.- Yap | 7.- Majuro | 12.- Lae | 17.- Honiara | 22.- Tonga |
| 3.- Guam | 8.- Tarawa | 13.- Manus | 18.- Noro | 23.- Apia |
| 4.- Chuuk | 9.- Kiritimati | 14.- Kavieng | 19.- Noumea | 24.- Pago Pago |
| 5.- Pohnpei | 10.- Wewak | 15.- Rabaul | 20.- Suva | 25.- Tahiti |

Observer Programmes:

- FMOB:** Federated States of Micronesia observer programme
- MHOB:** Marshall Islands observer programme
- PGOB:** Papua New Guinea observer programme
- SBOB:** Solomon Islands observer programme
- SPOB:** SPC observer programme
- FJOB:** Fiji observer programme
- PWOB:** Palau observer programme

? Not fully operational

