Fisheries Newsletter

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Editorial

Steve Beverly, the Fisheries Development Officer, has put on his samurai suit in this issue to help us discover all the facets of cutting "made in Japan" sashimi-grade tuna. His visit to the Osaka Fish Market revealed that the Japanese have a rather different technique, in comparison to the "Western" world, which involves the use of very long knives, or should I say, sabres to cut the tuna loins, which are then packaged and sold that same day on the local market.

The five-week SPC/Nelson Polytechnic practical training module was held in June and July in New Caledonia. As always, the trainees were able to put into practice all the techniques that they had learned during the 18-week classroom module in New Zealand. Two female trainees took part in this year's course, 'Asela Lausii from Tonga and Désirée Tukutama from Niue, and, believe me, they did not hesitate to put their hearts into the work. James Uan, a Training Associate with the Training and Information Sections, provides us with an overview of the module's activities.

Happy reading.

Jean-Paul Gaudechoux
Fisheries Information Adviser
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Lisa Williams

in This Issue

In it for the experience: 'Asela Lausii from Tonga (left) and Désirée Tukutama from Niue (right) working hard, hauling a mooring rope, during the practical module of the SPC/Nelson Polytechnic course, which was held in New Caledonia in June and July 2001

SECRETARIAT OF THE PACIFIC COMMUNITY
Prepared by the Information Section of the Marine Resources Division and printed with financial assistance from France.

FISHERIES DEVELOPMENT SECTION

The Section conducted two long-term technical assistance projects in the Commonwealth of the Northern Mariana Islands (CNMI) and Papua New Guinea (PNG). New Zealand will fund a three-year fish aggregating device (FAD) research project.

Technical assistance to CNMI

En route to CNMI, Fisheries Development Officer, Steve Beverly, stopped off in Osaka, Japan, where he visited the Osaka Central Market to observe fish handling and processing procedures (see feature article).

The purpose of Steve's trip to CNMI was to conduct several FAD fishing technique workshops with CNMI's Division of Fish and Wildlife (DFW) staff.

A total of four FAD fishing workshops were conducted, two on Saipan and one each on Tinian and Rota. Before the workshops started, several FAO-designed wooden handreels were constructed. A total of six reels were made: two were mounted on DFW's eight-metre (27–foot) Boston Whaler (Fig. 1), one was left on Tinian, one was left on Rota, and two were kept as spares.

During the workshops, monofilament vertical longlines, which were made using materials purchased from Hawaii, were loaded onto the wooden handreels. Rope vertical longlines were made, using tarred polyester rope, and then stored in plastic laundry baskets.

Branchlines for both types of vertical longlines were made using 1.5 or 2.0 mm monofilament and tuna circle hooks or Japan tuna hooks. Palu ahi lines were made to demonstrate a mid-water handline fishing technique.

All gear was made following instructions given in SPC's manual, *Vertical longlining and other methods of fishing around fish aggregating devices (FADs)*, which was given to all workshop participants. Nearly 50 CNMI DFW staff and local fishermen participated.

DFW's Boston Whaler, which could accommodate up to six participants, was used to conduct fishing trials. Several FADs are located around Saipan, Tinian, and Rota, and during the first workshop, fishing was conducted around FAD # 10, which lies just to the east of Tinian, but is accessible from Saipan. Two 18 kg yellowfin tuna were caught near the FAD using monofilament vertical longlines.

During the next Saipan workshop and the workshop on Tinian, fishing trials were conducted near seamounts, on reef drop-offs, and around FAD # 10. Fish proved to be scarce after the initial workshop, and no more tuna were caught near Saipan or Tinian, either near the FAD or on seamounts or drop-offs.

Fishing improved a great deal during the week on Rota. Fourteen yellowfin tuna were caught near FAD # 6 on the south side of Rota, 12 on the monofilament vertical longlines and one each on the rope vertical longline and the palu ahi line. The fish averaged about 15 kg each (Fig. 2).

After the workshops were completed, Steve accompanied DFW staff on one of their regular trips to the northern island, Farallon de Medinilla (about 50 nm north-northeast of Saipan), to gather data for a stock assessment study on bottom fish.

Steve Beverly

Figure 1: FAO handreel mounted on DFW's Boston Whaler — rigged with a monofilament vertical longline

After bottom fishing, DFW staff, using workshop materials and newly learned skills, set two monofilament vertical longlines on the drop-off east of Farallon de Medinilla.

Thirteen yellowfin tuna weighing about 15 kg each were caught on just forty hooks after a four-hour soak. The last day of fishing proved to be the best and made up for the poor fishing during three out of the four workshops.

DFW staff plan to continue using the FAD fishing techniques learned during the workshops, and will conduct more workshops for interested fishermen in the future.

Steve Beverly

Figure 2: Six yellowfin tuna caught on one vertical longline near the Rota FAD

Technical assistance to the New Ireland Commercial Fishermen's Association

The New Ireland Commercial Fishermen's Association (NICFA) was established to: unify the fishing and associated industries in New Ireland Province, PNG; promote fishing activities and related industries; and establish dialogue with PNG Fisheries and Marine Resources Authorities and parties interested in the development of fisheries in PNG. The association has 400 registered members with more expected to join as news of its existence spreads within the region.

NICFA, through the National Fisheries College (NFC), the National Fisheries Authority, and the PNG Department of Foreign Affairs, requested technical assistance to introduce offshore tuna and deep-water snapper fishing techniques to its members. NFC greatly assisted with the organising and operation of this project by making its facilities and equipment available. Training in a range of fishing techniques was provided over the three-month project.

Tuna longline fishing

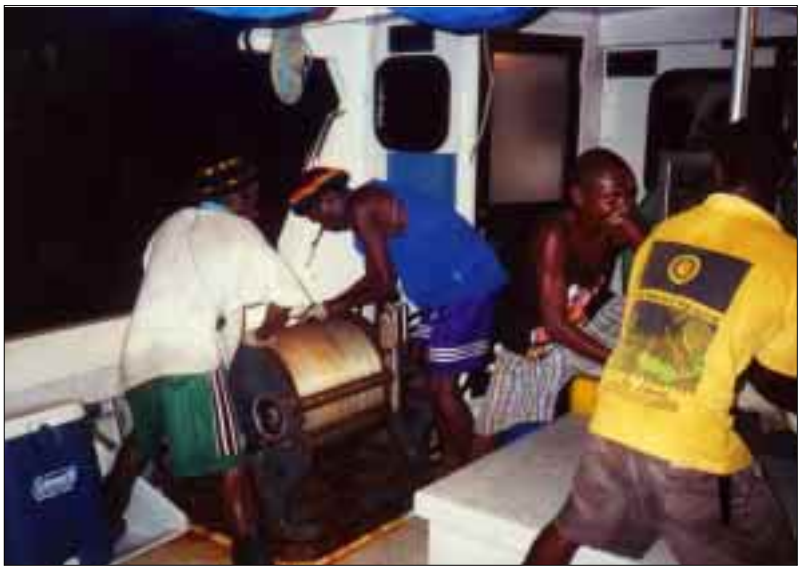
The first part of this project demonstrated horizontal pelagic longlining to 20 students who were completing their Certificate in Fishing Operations Course 1 (CFO 1) with NFC. The CFO 1 course is designed to give students the basic skills needed for employment as deck crew on commercial fishing vessels.

NFC's training vessel, FTV *Leilani* was used to carry out the horizontal longlining exercise (Fig. 3). Students were divided into two groups of ten. Each group was taken out on separate trips that lasted at least 28 hours, and designed to accommodate three sets. Line soaking periods during the day were filled in with trolling skipjack and yellowfin schools in the area.

The catch from the single set of 200 hooks came to 110 kg (gilled and gutted) and consisted of 4 yellowfin tuna, 1 swordfish and a snake mackerel (discarded). After three sets of 200 hooks each, the number and weight of gilled and gutted fish caught was 9 yellowfin (125 kg), 1 sailfish (25 kg), 3 barracuda (20 kg), and 2 blue shark (100 kg).

Students were grouped into three teams for the line setting operation. One team baited and attached the branchlines to the mainline, another group set out the floats and floatlines, while the third group prepared and topped up the bait bin. The arrangement was to have 25 hooks per basket (25 hooks between floats) and 8 baskets per set. The groups were rotated after each float was deployed.

As with line setting, each student was rotated to different duties after a float was retrieved during the hauling process. The duties involved unsnapping branchlines, restoring branchlines to the storage bin, hauling in and storing floats and floatlines, gaffing and boating fish, gilling and gutting fish (Fig. 4), and packing the fish in ice.



Steve Beverly

***Figure 3: Longlining operation on FTV* Leilani**

Fish aggregating device (FAD) site surveys, construction and deployment

Trolling for skipjack tuna and other pelagic species is one of the main fishing activities undertaken by the fishermen of New Ireland Province. This is mostly done from paddling canoes, outboard motor-powered banana boats (moulded fibreglass skiffs), and plywood punts. This mode of fishing is more often centred on the outer reef edges, inshore waters and the open sea.

In the past, the introduction of FADs aroused the curiosity of the local fishermen, and led them to pursue other methods that would effectively catch fish aggregated around these devices. Only a few people know of vertical longline fishing, small-scale horizontal longline and methods based on drop stone fishing.

Steve Beverly

Figure 4: Cleaning the catch from a longline set

The formation of NICFA has renewed interest in reviving commercial fishing activities beneficial to the development of fisheries in New Ireland Province. Discussions were conducted with representatives of NICFA to determine suitable areas for the survey of FAD sites. Four fishing grounds were identified as potential areas to deploy FADs.

A site survey of each of these areas, and an examination of the bottom topography helped identify the best location for deploying the FADs. Following the surveys, two sites were selected and two FADs systems constructed. The FADs were based on the Indian Ocean design (Fig. 5) but several modifications were made because of some of the SPC-recommended materials for FADs of this design were not available.

On 15 May a FAD was deployed off the northeast coast of Kavieng in 890 m of water. A second FAD was deployed on 25 May off the southwest coast of Kavieng in 1400 m.

Small-craft fishing workshops for artisanal fishermen

The workshops trained artisanal fishers in small craft safety and in operating banana boats for carrying out FAD fishing and deep-water snapper fishing techniques, and catching and supplying export fish species beneficial to support a commercial fishing industry (Fig. 6). Initially, this part of the project was to be implemented in two workshops of ten working days each. However, the large turnout of participants after the first workshop necessitated a third workshop. The remaining two workshops were rescheduled to be covered in six days each.

The three workshops were completed over four weeks and each workshop had 17 participants. Fifty one were trained.

While fishing methods such as palu ahi, drop stone fishing and ika shibi were discussed during the workshop, fishing methods such as vertical longline, horizontal longline and deep-water bottom reel fishing were elaborated on and practised.

Vertical longline fishing (Fig. 7) efforts around FADs caught 5 yellowfin tuna (212 kg), 1 bigeye tuna (62 kg), 1 bronze whaler shark (30 kg), 1 hammerhead shark (30 kg), and 1 opah (60 kg). A total of 19 vertical longlines were set over the three workshops with 20 hooks per vertical longline.

William Sokimi

Figure 5: Indian Ocean design FAD loaded on board FTV* Leilani *ready to take and deploy

William Sokimi

Figure 6: Banana boats heading to sea for practical fishing trials

Three sets of horizontal longline, with 50 hooks per set, caught 5 yellowfin tuna (211 kg), and 1 barracuda (9 kg). Trolling around the FADs caught 57 skipjack tuna (107 kg), and 3 mahi mahi (6 kg).

Deep-water bottom fishing at depths between 180 and 320 m resulted in 126 (500 kg). The deep-water bottom catch was of mixed species, including short-tailed red snapper (*Etelis carbunculus*), longtail red snapper (*Etelis coruscans*), gold-band jobfish (*Pristipomoides multidens*) rosy jobfish (*Pristipomoides filamentosus*), and small-tooth jobfish (*Aphareus rutilans*).

William Sokimi

Figure 7: Hauling a vertical longline from a banana boat

Bait catching methods

Catching and exporting tuna is expected to occur on a larger scale in the coming years. Bait for such fishing operations, especially tuna longline fishing, will be a major part of the expenses of such operations.

Several local fishermen showed interest in pursuing bait catching methods and requested that experiments be conducted with several net types as part of this project. Several species have been identified as possible baitfish for tuna longline. These are squid, scad, garfish and sardines.

A demonstration bouke-ami exercise was carried out using a 10.3 x 8.7 m bouke-ami net (Fig. 8) and an underwater light with dimmer switch. The dimmer switch used was insufficient to bear the load of the 1200 watt light used, and meant the preferred way of luring bait into the net could not be done. The operation was carried out though, to give the fishermen an idea of how the system works.

William Sokimi

Figure 8: Making up a bouke-ami net

After anchoring in a depth of 20 m, the bait light was streamed out behind the vessel and turned on. After three hours, ample baitfish could be seen circling around the light. The first set was done by luring the bait into the centre of the net with the lights at full glare.

Once at the centre, the signal was given to lift the net. This procedure allowed participants an insight into how the baitfish reacted to the net with no light dimmer.

The second set was performed with the current running, and participants had difficulty in hauling back and controlling the position of the net. The third set was attempted using an overhead kerosene lantern to lure the baitfish into the net.

Although baitfish were entrapped, the size was small and not suitable for tuna longlining.

Ideally, once baitfish have accumulated around the bait light and the current has eased, the light should be gradually dimmed to allow fish to congregate closer to it. Once the fisherman is satisfied that the baitfish are adequately concentrated, the net should be set and the baitfish lured in by slowly shifting the light to approximately the centre of the net. The light can then be dimmed further to around 20 to 30 watts, allowing the baitfish to circulate closer to the light as the signal is given to lift the net.

FAD research project for Niue and Cook Islands

In May 2001, the New Zealand Pacific Initiative for the Environment (PIE) granted funds for a three-year project to conduct research into FAD mooring designs. The project will be implemented in Niue and the Cook Islands. The objectives of this project are to:

- Develop a more cost-effective FAD mooring design with an average lifespan of at least two years, while reducing costs to a target unit level of NZD 4500 for deep-water FADs (1000 m depth) and NZD 3000 for shallow-water FADs (300 m depth);
- Conduct studies over the three-year life of the project with selected coastal communities, especially in areas where reef and/or lagoon marine protected areas (MPAs) have been declared and FADs deployed, to try to measure any benefits accruing to the communities and the usefulness of FADs as a management tool;
- Collect catch and effort data from fishermen involved in FAD fishing (by fishing technique), and conduct a cost-benefit analysis to estimate the benefits or disadvantages of using FADs; and
- Produce a technical manual and other literature, reports and articles to document the findings of the project, with the technical manual covering the new and recommended design for FADs based on the results of the project.

This project will commence in July/August 2001, with the development of a suitable catch and effort logbook, the design of a suitable survey questionnaire, a maintenance record sheet, and a sheet for recording the different aggregators to be experimented with.

Other Section activities

In Noumea, Fisheries Development Adviser, Lindsay Chapman, and Technical Support Officer, Marie-Ange Roberts, produced final drafts of all outstanding field reports for recent work undertaken by the Section. Most of these draft reports have been cleared, finalised and distributed.

In May, Lindsay travelled to Cook Islands where he attended the Forum Fisheries Committee meeting (FFC 48). While there, Lindsay also met with staff of the Fisheries Department to discuss the implementation of the FAD research project. These initial discussions focused on the materials that would be developed (logbooks, survey sheet, and the list of FAD materials). Consideration was also given to possibly undertaking work on Rarotonga and Aitutaki.

After his return to Noumea in June from CNMI, Steve began fishing with fisheries officer trainees, who were in Noumea for the Practical Fishing Module portion of the annual SPC-Nelson Polytechnic Pacific Islands Fisheries Officers Course.

Steve accompanied ten participants on fishing trips on Marine Marchande's 12-m catamaran, F/V *Dar Mad*. The highlight of the fishing was during a longline trip when the trainees caught a 66 kg bigeye tuna, using F/V *Dar Mad*'s monofilament longline gear. The fish (Fig. 9), which was caught just a few miles from the reef off Noumea, was exported to Japan where it fetched 44,000 yen. The course continued into July.

June was a busy month for the Section. Papers were prepared for the Heads of Fisheries meeting in July, including one on

Steve Beverly

Figure 9: A 66 kg bigeye tuna caught on the longline

bycatch from tuna longlining. Two posters on marine debris and derelict fishing gear were also presented. The Section is preparing a trolling manual, in both English and French, which will be placed on the Coastal Fisheries website.

June was also a sad month for the Section, as Marie-Ange has accepted a position with the SPC Health Programme. Marie-Ange has worked with fisheries for over ten years, and her services and skills will be greatly missed by all those in the Section. Unfortunately, changes that have been made to the budget will not allow the recruitment of a replacement for Marie-Ange's position, so the Section will now need to operate without the support, especially in desktop publishing and technical drawing, that Marie-Ange provided. All the staff of the Section wish her well in her new position at SPC.

■ TRAINING SECTION

Against the odds: women take on fisheries training

When 20–year old 'Asela Lausii signed up for the SPC/Nelson Polytechnic Pacific Island Fisheries Officers Training course, she had little idea of what an intensive course—split between Nelson, New Zealand and Noumea, New Caledonia—would expose her too. 'Asela, who is a fisheries extension officer in Nuku'alofa, Tonga, thought the toughest part of her job before leaving the Kingdom, was waking up to catch the early bus so she could get to work on time.

In July 2001, 'Asela returned to her job as a newly-certified diver, with enough sea-safety gear to start her own extension centre, and an abundance of experiences and memories. She reeled off a list of what she'd learned in 23 weeks of training: welding and engineering, net-making, navigation and chart-work, fish handling and quality control, report writing and practical fishing. All this in spite of the fact 'Asela gets very seasick.

The only other woman in the course, 27–year–old Désirée Tukutama of Niue, was not as badly affected by seasickness. What did the two women consider to be the highlights of their training? Learning a wide range of practical and technical skills, experiencing the ocean and lagoon, and opening their eyes to marine potential in the region. The down side for both was the lack of other women in the course, as they both felt the pressure of being the only females in a class of 9.

While the Nelson training has become a mainstay of practical fisheries training in the region and in 2001 entered its 22nd year, only a handful of its more than 260 Pacific Island trainees have been women – and the numbers are an indication of the industry rather than any bias. Tukutama says most fisheries officers in Niue are men although Lausii notes that desk staff in Fisheries in Tonga tend to be women.

(Source: Lisa Williams, Women's Communications Officer)

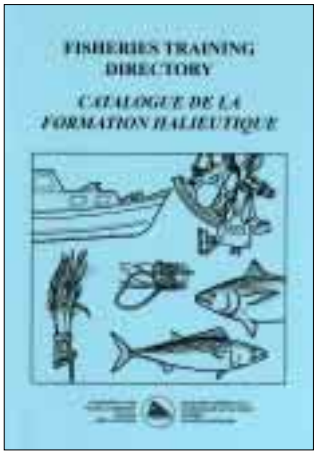
Fisheries Training Directory distributed

The Fisheries Training Directory lists opportunities available to the fisheries sectors of Pacific Island countries and territories and is available in hard copy, on database and more recently, on SPC's website at the following address

http://www.spc.int/coastfish/Reports/Training_Directory)

Helene Lecomte, Secretary to the Director of Marine Resources, coordinates the management of the Directory's database and updates institutions' entries in the database as well as to SPC's website.

At the end of June, a paper copy of the Directory was printed and distributed to fisheries contacts in the region and to participants of the 2nd Heads of Fisheries meeting in July.



SPC Nelson Polytechnic Practical Course

Nine students from the SPC/Nelson Polytechnic course arrived in Noumea on 17 June to undergo a five-week practical training on fishing techniques. The objective of the training was to expose participants to practical aspects of various types of fishing.

During their first week in Noumea they heard lectures by different SPC staff members on topics not covered during their time in Nelson. These lectures included port-sampling techniques offered by the Oceanic Fisheries Programme.

The Coastal Fisheries Programme taught fish aggregating device (FAD) fabrication and deployment, deep bottom fishing techniques such as longline and use of handreels, tuna longlining and trolling around FADs with baits and lures. Field visits were made to places of interest such as live reef fish operators' facilities, aquariums, a prawn farm run by IFREMER in New Caledonia and the Tjibaou Cultural Centre.

In the practical fishing session, participants used two boats, the 7-m catamaran, *Dar Mad* and the smaller 5-m skiff, *Pop*, generously provided by the Maritime Authority and the School of Fisheries (EMM). The latter also kindly allowed the students to utilise its fish-processing laboratory. SPC fully acknowledge these services.

Highlights of the fishing were tuna longlining when a 60 kg tuna (a record for this course) was caught by bottom longlining for deep-water snappers. The tuna was later shipped to Japan so participants could observe its preparation. SPC's Fisheries Development Officer, Steve Beverly, supervised all fishing operations.

Students were given an introduction to scuba diving (according to the French system) to enable them to do underwater visual census surveys. The course involved theory and a pool session followed by open-water practice. The next day students did an underwater visual census with the Reef Fisheries Assessment and Management section.

Staff from SPC's Health Programme gave participants an HIV/AIDS awareness lecture. Two trainees from Nauru and Niue stayed on and observed the Heads of Fisheries meeting where fisheries topics were discussed in more detail. Participants for this year's practical training course came from: Kiribati, Nauru, Tuvalu, Tonga, Niue, Samoa and Vanuatu.

Steve Beverly

Steve Beverly

Steve Beverly

The students were exposed to practical aspects of fishing

In brief

- Collaborative work with the Community Fisheries Section enabled the design of a regional course aimed at building a pool of national trainers of women engaged in small-scale post-harvest fisheries activities. This course, funded by NZODA, is scheduled for November 2001 in Nelson, New Zealand. It follows two consecutive regional courses, which trained women with managerial responsibilities in larger seafood enterprises (May 1999 and November 2000).

- In May, with funding assistance from New Zealand, a fishing industry study tour was organised for five senior fisheries managers. The two-week study tour consisted of visits to fisheries institutions and seafood enterprises in Wellington and Nelson to expose participants to New Zealand's approach to the co-management of its commercial fisheries resources. Of particular interest was the relationship between the Ministry of Fisheries and the various stakeholders. This study tour, the first of its kind in the region, was perceived as extremely useful by the five participants from Tonga, Papua New Guinea, Federated States of Micronesia, Samoa and French Polynesia

- Following the successful pilot Traineeship Programme for Pacific Island Fishers organised by the Section and the Australian Fisheries Academy (AFA) in 2000, AusAID has agreed to finance a similar programme in 2001. The course will again follow the format of the successful Wild Catch Traineeship Programme initiated by AFA during the mid-1990s. Eight carefully selected fishing deckhands from the Pacific will attend six weeks of shore training at AFA campuses in Adelaide and Port Lincoln prior to an invaluable four-week practical experience onboard Australian commercial fishing vessels. The programme, advertised in July, will run from October to December.

- Following the successful example of commercial fisheries co-management in Samoa, a strategy for the promotion of co-management principles has been developed. This includes the wide distribution of a manual in the region. The manual was written by the Samoa Commercial Fisheries Adviser and ex-SPC masterfisherman, Peter Watt. The Section has coordinated SPC's inputs into the drafting of the manual, which is expected to be available by the end of 2001.

- In Samoa, a tuna loining workshop was run in April for staff of three Apia-based fish exporting companies. The Section hired a tuna filleting expert from Tahiti as the resource person for the workshop. As a result of this training and the tuna grading workshop run in December 2000, local companies have diversified the marketing of their tunas, with exports of fresh chilled sashimi-grade yellowfin and big-eye tunas as well as albacore tuna loins having increased sharply.

- In Papua New Guinea, the Section has continued its assistance to set up the National Fisheries Authority (NFA) as the competent body for monitoring PNG exports of seafood products. Using AusAID funding, the Section hired, in May, a consultant to train staff of NFA's Seafood Audit and Certification Unit in auditing a large tuna cannery in Madang. This assistance follows an HACCP workshop organised for the same staff in October 2000.

- With funding assistance from France, a boat building training project began in May at the Santo boatyard in Vanuatu. A consultant/tutor from the New Caledonia School of Fisheries was hired to introduce a new boat design and teach local boat builders the West System construction technique. The first part of the training took place in May/June and was four week in duration. The second part, of two weeks, is scheduled for August.

- In June, three additional proposals were submitted to NZODA and Taiwan/ROC. Funding is sought from NZODA for the 2002 SPC/Nelson Polytechnic Fisheries Officers course and the 3rd regional course on vessel operation management and electronic aids for commercial fishing skippers. The proposal to Taiwan/ROC consists of a series of in-country USFDA/HACCP workshops for quality control staff of seafood enterprises. A funding proposal for aquaculture training will be submitted to the government of France in September. If approved, this project will enable several individual training attachments of aquaculture technicians from the region.

COMMUNITY FISHERIES SECTION

Chuuk and Yap workshops

In May the Community Fisheries Officer conducted two workshops for women involved in small-scale fisheries activities in Chuuk and Yap. The workshops were a follow up to surveys done in 2000, and followed recommendations made in the reports: *An assessment of the role of women in fisheries in Chuuk, Federated States of Micronesia* and *An assessment of the role of women in fisheries in Yap, Federated States of Micronesia*.

The reports recommend that more training programmes be provided to those involved in subsistence and artisanal fisheries, particularly women. The SPC Community Fisheries Section agreed to assist in running workshops in both states, targeting those involved in small-scale fisheries activities for the local market, with no previous access to fisheries training.

The workshops for Chuuk and Yap were the final part of work begun in FSM two years ago. In 1999, FSM requested assistance from the Community Fisheries Section in assessing, documenting and subsequently training women involved in small-scale fisheries. This work was done with the assistance of national counterparts, Estephan Santiago (National Fisheries Section) and Anne Luior (National Women's Interest Officer). It was agreed that, because of differing cultural and fishing practices in each state, separate visits and reports would be undertaken for Pohnpei, Kosrae, Chuuk and Yap. State-level counterparts were identified to assist with each visit.

The efforts of the National Women's Interest Officer, Anne Luior, in initiating and supporting this work in FSM is acknowledged here with sadness — Anne passed away in December 2000, before the completion of the work in her home state of Yap.

The Community Fisheries Section work in FSM has resulted in the production of four assessment reports, followed by small-scale fisheries training, for all FSM states. The work reflects a commitment by the FSM National Fisheries Section to ensure both men and women are considered in the management and development of the domestic fisheries sector.

Successful development of the medium– and large-scale fisheries sector is dependent on having a broad base of people with experience and training in all sectors of the industry: harvesting, processing and marketing. Those currently involved in the small-scale fisheries sector are the people that development efforts should target. In most Pacific Island countries, women are involved in post-harvest and marketing activities and, when commercial fisheries develop, they are often employed in various capacities onshore. Basic

Lyn Lambeth

Lyn Lambeth

Processing fish during the workshop in Chuuk

Lyn Lambeth

Closing ceremony of the Chuuk workshop

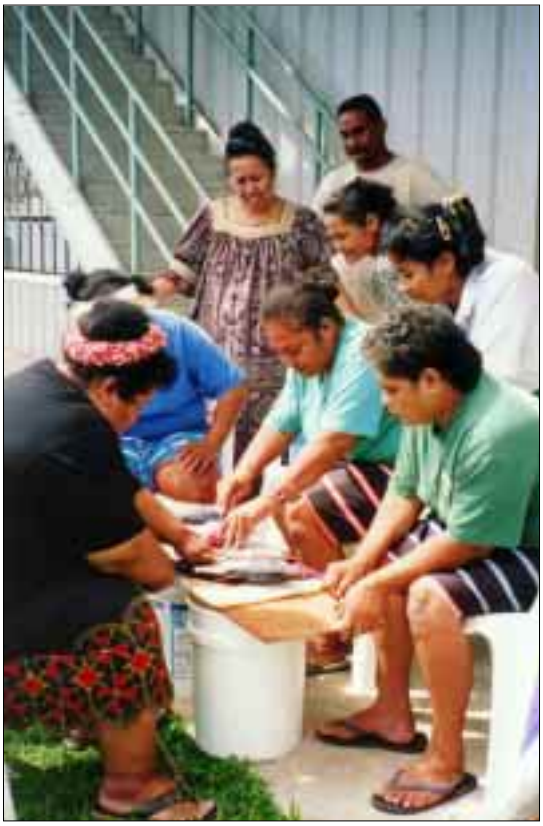
training in seafood quality, spoilage, handling, processing, preservation, business and marketing is often lacking.

Topics covered at the Chuuk and Yap workshops included seafood quality control, fish processing and handling, small-scale marketing and business skills, seafood preservation, and fisheries management. During the workshop, participants built and tested a small fish smoker.

Follow-up activities recommended include:

- further training for Yap, and the outer islands of Chuuk, to be provided by national fisheries agencies, with SPC support as needed. Training should include practical fishing and harvesting activities to emphasise correct handling from capture to market;
- continued support form SPC with the production and distribution of relevant training material;
- increasing awareness on pollution issues in Chuuk and Yap; and
- supporting key participants identified by the Community Fisheries Section for further regional training opportunities. The Section will liase with regional agencies and other sections within SPC in the selection of participants for further training.

The Chuuk workshop trained 34 women, including one staff member of Chuuk Marine Resources and two from COM-Land Grant. Tanseny Reynold (Special Assistant for Women's Affairs) was the main counterpart, assisted by Ramio Osiena (Deputy Director of Marine Resources) and Shinobu Poll (President of the Chuuk Women's



Lyn Lambeth

Processing fish before smoking in Yap

Advisory Council).
shop venue was the waterfront patio of the Truk Stop Hotel. Apart from the topics covered by the Community Fisheries Officer, presentations were also given by Ramio Osiena (fisheries and marine environmental regulations of Chuuk), Julita Albert of the Environmental Protection Agency, and Bernard Billimont from the Mayor's Coordinating Office (traditional fisheries and marine resource protection). During the evaluation at the conclusion of the workshop, everyone agreed that all the topics were useful, with small business skills and conservation and management singled out as being especially useful.

The Yap workshop trained 16 women and three men, including one staff member of the FSM Fisheries and Maritime Institute, two COM-Land Grant staff and one from the Yap Community Action Program (YapCap). Three other staff of the FSM Fisheries and Maritime Institute also attended the sessions on conservation and management of marine resources. Denitha Palemar of Yap Women's Association provided organisational support for the workshop, assisted by Yap Marine Resources and Management Division, YapCap, and Com-Land Grant. The workshop was held in the YapCap conference room, with practical sessions conducted outside the Small Business Centre.

The timing of the workshop coincided with a visit to Yap by Francis Itimai, Head of the National Fisheries Section. Francis gave participants an overview of fisheries from the national perspective, and discussed the work of the National Fisheries Section. Andy Tafileichig, Chief of Yap Marine Resources and Management Division, presented the state perspective, with a talk on the role of the Division, and marine resource management issues in Yap. Seafood quality and handling, and marine conservation and management were considered the most useful topics by participants at the conclusion of the workshop.

Lyn Lambeth

Building the smokers in Yap

Forum Fisheries Committee Meeting (FFC 48)

In May 2001, the Community Fisheries Adviser (CFA) travelled to Rarotonga, Cook Islands, to attend the Forum Fisheries Committee Meeting. The primary objectives of the travel were to: discuss the SPC Community Fisheries Section with interested heads of fisheries, hold discussions with FFA on the section's work on gender issues in tuna management plans, and learn about the Cook Islands **ra'ui** system.

The CFA was fortunate to meet with the President of the Koutu Nui (body of traditional chiefs), and initiator of the **ra'ui** Marine Protected Areas (MPAs) in Cook Islands, Te Tika Mataiapo Dorice Reid. Mrs Reid knows a lot

The work-

about the traditional system that require Cook Islands communities to undertake obligations for the management of MPAs, under the guidance of traditional chiefs. More interesting was her view on the need for village rules to be accorded legal recognition. She spoke against the phenomenon of legal recognition which is true in the case of small island countries like Cook Islands.

The CFA also met with Jaqueline Evans, coordinator of the WWF South Pacific Program in the Cook Islands, who played an important role in raising public awareness of the **ra'ui** MPAs. The discussion was very useful in light of her own views about the **ra'ui** and the involvement of the Ministry of Marine Resources. The contribution of the Ministry of Marine Resources, through its technical advice and assessment of the **ra'ui** MPAs was deemed appropriate and important in many aspects.

There are eight **ra'ui** MPAs throughout Rarotonga covering about 42% of the Rarotonga lagoon area (Evans 2001) with different terms and conditions determined by the various communities for their management.

Publications and Information

The reports, *An assessment of the role of women in fisheries in Chuuk, Federated States of Micronesia* and *An assessment of the role of women in fisheries in Yap, Federated States of Micronesia* have been printed as field reports and distributed to relevant agencies at the state and national level. These and other publications may be found in pdf format (and html for the Women in Fisheries bulletins) on the Community Fisheries Section homepage at:

http://www.spc.int/coastfish/Sections/Community/index.html

Publications are also available from SPC's Publications Distribution Assistant:

Secretariat of the Pacific Community
BP D5 - 98848 Noumea Cedex
New Caledonia
Telephone: +687 262000
Fax: +687 263818
E-mail: Publications@spc.int

A series of eight community training manuals are currently being developed by the University of the South Pacific and the SPC Community Fisheries Section. Originally designed to serve the needs of the fisheries module delivered each year to students at SPC's Community Education and Training Centre, the manuals are now being developed for use throughout the region.

When finished, they will provide a training resource for community training at a level similar to the workshops held in Chuuk and Yap. The first three or four manuals in the series should be printed in the coming months. The complete set of manuals will cover the following topics:

1. Fishing
2. Seafood in our Meals
3. Sea Plants
   - 3.a Guide to common edible and medicinal sea plants in the Pacific Islands
   - 3.b Sea vegetable recipes for the Pacific Islands
4. Seafood Spoilage and Sickness
5. Seafood Handling
6. Seafood Processing and packaging
7. Business Skills
8. Fisheries Management

REEF FISHERIES ASSESSMENT AND MANAGEMENT SECTION

Training the trainers workshop

Rapid assessment techniques of fisheries and biodiversity resources using Fishbase tools (Noumea, New Caledonia, 7–9 May 2001)

The purpose of the workshop was to train trainers in techniques for rapidly assessing fisheries and biodiversity resources using the tools contained in FishBase. The workshop mainly targeted officers of organisations and research agencies that operate at a regional level, and who, through their work, would be likely to promote the use of these tools.

The three-day training workshop held at SPC headquarters, was attended by nine participants from five different organisations: ICLARM, University of the South Pacific, IRD (French Institute of Research for Development), University of New Caledonia, Secretariat of the Pacific Community

The programme of activities was discussed by Maria Lourdes Palomares and Pierre Labrosse before the workshop, to determine participants' areas of interest and concern. In addition to an update on FishBase 2000 functions, three main topics were covered: distance updating of countries and common fish name data; technical sheets; and TrophLab.

Each topic was followed by examples of practical applications, which came, wherever possible, from the participants themselves.

The end of the workshop was devoted to a discussion designed to elicit participants' impressions of the presentations and work carried out in relation to their own activities. This discussion also provided an opportunity to assess future needs regarding to the use of FishBase 2000 and its related functions.

SPC Pacific Regional Live Reef Fish Trade Initiative

Introduction

During the second quarter of 2001, several field trips were undertaken as part of SPC's Pacific Regional Live Reef Fish Trade (LRFT) Initiative work activities. It was the first time that actual fieldwork was conducted since funding was approved for this initiative from the Asian Development Bank (ADB) in December 2000.

Activities

The activities conducted consisted of three field trips and one workshop. Details of each of these activities are described below.

Following a regional collaborative workshop in Honolulu, which addressed issues and problems of the live reef fish trade, SPC's Live Reef Fish Specialist, Being Yeeting, discussed funding opportunities with representatives from the MacArthur and Packard Foundations. As a result of these discussions, a project proposal was submitted to the MacArthur Foundation requesting funding to continue and extend the present SPC Pacific Regional LRFT Initiative. Present funding support from ADB ends in January 2002.

The proposal requested USD 638,000 for a two-year period to cover salaries of two SPC based-LRFT staff and their activities in countries throughout the Pacific. The MacArthur Foundation sent formal approval for the proposal but less than the amount requested – USD 300,000 for three years. The section is hopeful that the Packard Foundation will come through with the remaining portion of the requested funding in their next year's budget. Funds will be used to maintain SPC's assistance to its member countries and territories in addressing live reef fish trade issues of concern.

Ujae and Lae (Marshall Islands) Ciguatera Fish Poisoning Surveys

Ciguatera fish poisoning is a serious problem for many Pacific Island countries. It is a major threat to local fishing communities that depend heavily on coastal fish resources, as well as to those countries that wish to develop reef fish export trades to generate income. A better understanding of the situation and extent of the problem in the region is imperative, both for local communities and entrepeneurs.

In the Marshall Islands, ciguatera fish poisoning is a common threat to fisherfolk. Some atolls, such as Ujae and Lae atolls, however, are uninfected or have at least insignificant incidences of poisoning.

In June 2000, due to the sudden increase of ciguatera cases in Ujae and Lae, the mayor and senators of the two atolls requested SPC to look at the problem. Between 08 and 22 March 2001, the Live Reef Fish Specialist visited the atolls and conducted a survey.

With logistical support from the Marshall Islands Marine Resources Authority (MIMRA), algae samples were collected from various sites within the atolls (20 samples from Ujae and 16 samples from Lae). These samples were processed on site and taken back for counting and analysis. Historical information on ciguatera poisoning came from interviews with local communities, and medical reports of past fish poisoning incidences came from the Health Department in Majuro.

After spending time with the island communities, it became apparent that there was generally a poor understanding about ciguatera fish poisoning, especially its causes and effects. Community meetings were,

therefore, organised to give a simple explanation of the technical aspects of ciguatera and its implications to fish and people. To facilitate dialogue, a ciguatera poster, produced by the SPC Fisheries Information Section in collaboration with IRD, was used. The poster helped tremendously, but fact sheets or information leaflets about ciguatera fish poisoning, which people could take home to use as a reference or a reminder, would also have been useful. This would also give local fishers the opportunity to read and study the contents of the fact sheets on their own time.

A report describing the results of the survey is being prepared, and will include recommendations and strategies for minimising the incidences of ciguatera fish poisoning. The report also details a ciguatera monitoring program for MIMRA.

Regional Technical Assistance (RETA)

Lau Islands LRFFT Resources Survey

The purpose of this work was to conduct a baseline biological assessment of potential live reef food fisheries resources of selected islands of the Lau Group, Fiji, in response to a request from the Lau Provincial Council through Fiji Fisheries Division of the Ministry of Agriculture, Fisheries and Forestry. This assessment would be used to make recommendations for the formulation of a management plan for this potential fishing industry.

The study was undertaken from the 19 August to 2 September 2001. The study team included: SPC's Live Reef Fish Specialist, Being Yeeting; Dr Terry Donaldson (Senior Scientist of International Marinelife Alliance (IMA)); Steve Why (IMA South Pacific Director); and Gerry Reyes (IMA staff), who video of the field work. Iliapi Tuwai from Fiji Fisheries accompanied the team. With the permission of the Director of Fisheries in Fiji, SPC was able to organise and fund the participation of a Tongan Fisheries Officer, Mr Sione Mailau to observe and learn the survey methods.

The survey team conducted 16 timed underwater visual transects at two fixed depths (10 m and 20 m) in selected habitats in the Bukatatanoa and Reid reef systems. The amount of area surveyed was determined by using global positioning system (GPS) coordinates. The number of individuals of a species observed along each transect was counted. Estimates of body size (total length), habitat association, and habitat quality were also made.

The data collected will provide estimates of density, relative abundance, length-frequency distribution, biomass, and diversity of target species (primarily groupers, Serranidae: Epinephelinae, and humphead wrasse, *Cheilinus undulatus*, Labridae). These estimates may be used to predict potential levels of sustainable harvest, and provide a basis for the development of management strategies.

Papua New Guinea LRFFT Awareness Workshop

The workshop was held at the Mohonia Na Dari Research Station, Kimbe Bay, West New Britain, PNG, and was organised by TNC. It was the first step in the Live Reef Food Fish Trade (LRFFT) awareness activities in the region. The main purpose of the workshop was to bring together fisheries officers, information specialists and others to discuss the issue of awarness regarding the LRFFT. The primary aims were to determine the main message and the most effective way to deliver that message, and to identify the target audience.

Participants of the workshop included SPC's Live Reef Fish Specialist, Being Yeeting and Fisheries Information Specialist, Aymeric Desurmont; two staff from the International Marinelife Alliance (IMA); two staff from The Nature Conservancy (TNC) and a TNC hired consultant; one staff member from Papua New Guinea National Fisheries Authority (NFA); one from World Wildlife Fund (Solomon Islands); and one from Mahonia Na Dari – PNG.

At the end of the workshop a list of awareness materials to be developed was agreed on. The list includes:

1. Information sheets, giving a simplified overview of the LRFFT and describing some simple concepts of resource management and the biology of fish targeted by the trade.

2. Fact sheets
   - Simplified overview of trade;
   - Management options and monitoring;
   - Resource biology/ecology – simplified;
   - Chain of custody and pricing issues;
   - Talking points to quiz industry; and
   - Monitoring and enforcement.

3. A 5–10 minute video targeting government decision-makers.This will take the form of an interview between a scientist who has a good knowledge of the LRRFT, a head of a regional fisheries department, and a journalist. Video footage of fishermen using destructive

techniques and some of the bad practices of the trade would be shown during the interview.

4. Video – theatrical play by Wan Smolbag, a Vanuatu group. This video will target communities. Wan Smol Bag team was met by Steve Why prior to our workshop. They were looking for fisheries-related subjects, and told Steve that they had money to produce videos and theatrical plays.

5. Feltboard kit that would include all materials, instructions on how to assemble, how to use, and a number of prepared stories for awareness. This would be used mostly for school kids.

6. A 10-minute Powerpoint presentation that can be used for government officials, boards, etc.

7. Fish ID Cards for field workers, fishermen and industry staff.
   - A-4 size page with 10-15 main target LRFFT species with scientific name, common name and a blank space for local names to be added by locals. (waterproof); and
   - Flip Cards – all above and also biological/ecological facts, 1 species per card (waterproof).

8. Manuals in form of a series. 3 to start with but list to be added:
   - Best practices targeting industry and community leaders;
   - Monitoring targeting government; and
   - Management options and guidelines.

9. Fish poster summarising the information given on the flip cards

Assessment of Aquarium Resources and the Trade in Christmas Island, Kiribati

The aquarium trade on Christmas Island started in the early 1980s with just one locally owned operation. To date, there are nine registered local operators. This has triggered some concern within the Kiribati Fisheries Division, especially considering there is no knowledge of the extent of the resources, and no management plans or measures to control the industry. In addition there have been quite a number of diving casualties that have caused a financial burden on the Government of Kiribati in terms of treatment costs and hospitalization in Honolulu.

In early 1999, the Government of Kiribati requested SPC to examine the aquarium fish trade on Christmas Island and to assess the resources and develop management guidelines.

A two-week trip was made to Christmas Island from 17 June to 2 July and involved the SPC Live Reef Fisheries Specialist and three staff members from the International Marinelife Alliance and staff from the Fisheries Division on Christmas Island.

An assessment of aquarium fish resources was made using underwater visual census methods. Information on the trade was collected through meetings with operators, export data from the Fisheries Department, and through interviews with local aquarim fish collectors.

The outcome of talks and discussions with the operators, collectors and government officials was very promising. There was strong agreement and support among the different interest groups on the need for good management policies and measures to control the aquarium fish trade. This is an important requirement for developing a workable management plan.

Data from the surveys are being processed and analysed to get first estimates of stocks. A report discussing the extent of the resources and recommendations for a management plan to control the trade will be submitted to the Government of Kiribati. Several of the recommended plans of action for establishing a managed aquarium fish operation on Christmas Island will be incorporated in the future work activities of the SPC Pacific Live Reef Fish Trade Initiative and will form the basis of follow-up trips in 2002.

Future Plans

The following gives a general idea of what future activities include. These activities will be funded by ADB RETA and are expected to becompleted by the end of January 2001. There are various activities besides the current planned fieldwork that also need to be accommodated in the very tight work schedule. It is therefore planned that a no-cost, three-month extension for the project will be requested.

- Acquisition of information and materials for regional LRFFT database;
- Establishment of LRFFT regional database;
- Vanuatu aquarium and LRFFT surveys;
- Tonga LRFFT resource survey;
- Launching of regional LRFFT database;
- Solomon Islands LRFFT management meeting;
- Marshall Islands LRFFT resource survey; and
- PNG LRFFT resource survey and monitroing of spawning aggregation sites.

OCEANIC FISHERIES PROGRAMME

For the past few months, the OFP has been involved in a study on the tuna's ecosystem in the west-central Pacific. In addition to tuna, the study will examine other animal and plant species in the same environment, including phytoplankton, zooplankton, crustaceans, cephalopods (squid, octopus), fish, turtles, marine mammals and birds. The study's long-term objective is to acquire an adequate amount of information on the species involved in the ecosystem in order to propose ecosystem-based tuna resource management.

Currently the tuna management tool used in the west-central Pacific is based on single species stock assessments, which treats exploited species as if they were isolated from one another and the rest of the ecosystem.

In order to achieve this ecosystem-based management, biological information must be gathered on all the species involved. The initial information to be collected will include predator-prey relationships that exist between various species in the ecosystem. Identifying and quantifying these relationships will make it possible to create a food chain model with tuna as a large predator and "fishing" as a super-predator. In order to acquire the information needed to establish this model of the trophic network, a vast sampling campaign will be set up over the entire west-central Pacific region with the assistance of the national observer programmes of the various countries in this area. Observers will collect stomach and muscle samples from all fish species harvested by longline and purse seine fishing, the two main types of tuna fishing gear used in the region.

Valérie Allain

Unloading the catch of a purse seiner

Stomach contents will be analysed at SPC in Noumea in order to identify the kind and quantities of prey species consumed. Muscle samples will be subjected to in-depth chemical analyses (stable carbon isotope and nitrogen levels) in order to determine the exact trophic level of each species, i.e. where each one is situated along the herbivore – super-predator gradient.

Two ocean campaigns were conducted to determine sampling protocols by taking into account the problems observers will face. The first was carried out on the *Keitre*, a New Caledonian longliner from the Navimon Company, in New Caledonian waters for a period of 10 days. The second expedition took place onboard the *Elspeth*, a Korean purse seiner from Dongwon Industries, in the Federated States of Micronesia and the Marshall Islands over a span of three weeks.

These two campaigns allowed initial samples of 367 stomachs and 271 muscles to be collected from 23 different species. They also made it possible to determine a sampling protocol, which will be presented in the form of a leaflet with explanations and photos illustrating the various sampling stages. As soon as these leaflets are ready, they will be distributed to observers, who will then be able to begin sampling.

CONGRESS BANS SHARK FINNING

A congressional bill to amend the Magnuson-Stevens Fishery Conservation and Management Act, which prohibits the landing of shark fins without an accompanying carcass, was signed into law on 21 December 2000. This new law will have the following consequences:

- Ban on finning sharks (discarding carcass) from US fishing vessels throughout the exclusive economic zone (EEZ) or on the high seas;
- Ban on foreign fishing vessels transshipping fins through US ports;
- Possible prohibition on foreign vessels possessing shark fins to refuel and reprovision at US ports; and
- Possible prohibition on US imports of shark fins by conventional cargo vessels.

The anticipated impact on the Hawaii-based longline fleet will probably be minimal. Finning activity ceased almost entirely within the state after the Hawaii Legislature passed a bill in May 2000 banning the landing of shark fins without carcasses, said Gary Moniz, chief of the Hawaii Division of Conservation and Resources Enforcement. The effects of the federal law on the Asian restaurant and apothecary trade are still not known.

(Source: *Pacific Islands Fishery News* • Spring 2001)

SHARKS: THEIR ROLE IN THE HUMAN/MARINE SPECIES INTERACTION

Among the fishes, sharks are unique in several different categories. These include their skeletons and sensory organs, their methods of reproduction, and their ecosystem niches, especially their feeding and migratory patterns.

In one way or another, each of these categories has some role in sharks' current biological status, and the likelihood of them being reasonable candidates to support a sustainable fishery for human communities. For the purposes of this article, 'sharks' is a generic term meaning a group of similar fishes: sharks, rays, and skates.

Sharks are fish that are located at the top of the food chain. They are excellent predators, feeding adaptively on other fish, and sometimes smaller sharks of their own and other species. Being at the top of the food chain generally implies fewer numbers of animals and a susceptibility to changes in their food base.

These animals are known, as a group, to have extended migratory routes and the ability to follow local environmental changes such as oceanic current changes under El Niño conditions. An implication of their migratory flexibility is that sharks occupy a wide range of oceanic and coastal niches, often at different times of the year or lives. This flexibility accounts for the high species diversity in tropical environments and their extension to niches in polar regions.

These observations suggest a group of species with the ability to adapt to ecosystem change and natural selection. Despite their adaptability, the question of how they will react to not being at the top of the food chain, but instead being heavily hunted, remains unanswered. Will the species as a group be able to compensate for the increased harvests by changes in their life histories?

The reproductive patterns employed by sharks are also diverse but, as a group, can be categorised as involving high parental care and low reproductive rate. It is unknown whether shark species will be able to adapt to the decreased density of smaller fish due to increased fishing mortality by humans.

A major reason that sharks are considered a different type of fish is that they do not have bones. Their entire skeleton is constructed from cartilage.

Furthermore, the sensory organs of sharks are unbelievably complex and efficient. When these long-range sensory organs are combined with high migratory capability, it suggests that most species will live essentially solitary lives. While sharks are often observed milling around in clusters, this is likely associated with a local feeding source that has become available for a limited time.

In terms of their exploitation by humans, their non-schooling behavior protects them from being harvested in large numbers as are tuna. But, their long-range ability to detect food makes them susceptible to chumming and other artificial types of lures.

A combination of the above three categories: migration, reproduction, and sensory sensitivity leads some species to use bays, estuaries, and coastal regions within 10 miles of shore as nursery areas for juveniles. The separation of mature and juvenile animals from each other reduces juvenile mortality.

Though this also raises juvenile mortality from humans who focus on large numbers of juveniles clustered in smaller areas. At the moment, the impacts of the removal of large numbers of pre-reproductive (juvenile) animals will have on the whole population is unknown.

From the viewpoint of fisheries in developing countries, the already observed decreases in the number of juveniles available for harvest is a source of concern. The last category of interest is shark skeletons, skin, and organs, and their growth rate.

Two decades ago shark meat was low on the list of desirability in most fish markets, but in the last decade has become desirable. Reasons include decreasing supply to the established shark markets, decreasing abundance of other fish in the primary and secondary categories, increasing desirability as a delicacy (European, and US markets), and some sharks are ued eitl1er for shark fin soup or as an aphrodisiac (primarily in Asian markets). The increase in the number of markets makes the animal worthy of targeting by fishers everywhere. Another factor is that sharks are extremely slow growers and reach sexual maturity at any age between 12 to 70 years.

Worldwide, and more locally in Central America, food security based on shark captures alone is an unlikely situation in general. Food security based on shark captures as a part of the management of a general marine fishery is an attainable goal, within bounds. Fisheries management is usually partitioned into the parts dealing with human institutions and their policies, and those concerned with stock assessment.

The best predictive models of shark populations are quite similar to those used for marine mammal populations. The analogy is a useful one to keep in mind since the biology and ecosystem role of sharks are more closely related to mammals than to most fishes.

Annual worldwide shark, skate, and ray catches reached 800,000 metric tons (about 2 billion pounds) in year 2000. Their capture occurs as a result of:

- Being targeted by artisanal fisheries in developing countries;
- Being targeted by small, semi-industrial fisheries in both developed and developing countries in coastal environments from tropical to temperate waters;
- Being taken as incidental catch in larger, industrialized fisheries where tuna, swordfish, or related species are targeted.

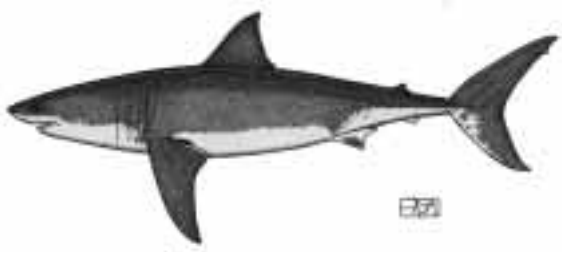
While the distinction between targeted-catch and bycatch is often made, there is evidence that many fisheries target sharks during the part of the year when the tuna or swordfish are not available.

Nicaragua and Costa Rica were the two Central American countries that first sustained commercial shark harvests for both export and domestic markets. The pattern spread to other Central American countries as supplies to the traditional domestic fisheries of snappers, croakers, etc., were strained, and as supplies to the export market on shrimp were also strained.

Different countries have different utilization rates of the various shark parts. These parts are categorized as fresh meat, dry meat, salted meat, fresh fin, dry fin, cartilage, liver oil, jaws, and skin. Depending on the category, nearly 100 per cent could be for export, while others will be retained for domestic consumption. The point here is that the value of the meat and fin markets probably approaches USD 100 million and is growing.

From 1987 to 1997, the fin market in Costa Rica alone increased by 236 per cent. In Central America, the removal of the income from the shark catches would be sorely felt by the fishers, the owners of the large corporations, and the national treasuries via taxes. It cannot be denied that these human needs must be considered when shark species' conservation needs are considered.

The point of the statistics on catch is not only the big numbers. The point being made is these catches are distributed over ages that range from juvenile, and thus will never become



reproductive, and large, old sharks that took decades to become reproductive.

In other words, by definition, a sustainable fishery for any species is based upon the premise that the harvested biomass removed is balanced by the biomass added from natural reproduction. While no conclusive statistical evidence exists, it appears that too much of the harvest today comes from the mature segment of the population, thus shrinking the source from which juveniles are added to compensate for the removals (delayed by the 12 to 70 years to become reproductive).

Also, the removal from the juvenile stock by artisanal fisheries actually removes some fraction of the juveniles that did result from natural reproduction.

Thus, most stock assessment models assume that only 'surplus production' is being harvested, thus allowing an equilibrium or sustainable harvest to develop. However, current and predicted shark harvests appear to be contributing to the likelihood of future stock failures. In agricultural terms, these harvests are analogous to consuming the seeds this year for next year's wheat crop.

In summary, the statistics provided for Central American shark fisheries do nothing more than indicate that similar data would be needed for the fishing activities in South America, Southeast Asia, Africa, and many other locations around the globe. The future is dire for both the shark species and the human dependencies that have built up around the associated market places for shark products.

(Source: article by Vincent Gallucci published in *InterCoast* • Winter 2001)

NEW WTPO AGREEMENT

In early March 2001, tuna boat owners gathered at the 3rd WTPO (World Tuna Purse seiners Organization) meeting in Guayaguil, Ecuador, and agreed to continue their reduction measures on the global catch of skipjack tuna.

Of the countries represented, Philippines, Spain, France, Japan, Venezuela, Colombia, Panama, Taiwan, Korea, Mexico, Ecuador officially signed the new WTPO agreement.

In the agreement, an explicit exception was made for the IATTC vessels fishing skipjack in the eastern Pacific Ocean. All IATTC vessels are allowed to fish at normal capacity up to June, since currently the tuna purse seiners, in this ocean, are experiencing a dramatic drop in skipjack catches of 40% compared to last year.

Also, skipjack catches in the Western Pacific have been declining, not only due to execution of the reduction measures but also because of natural factors.

Despite the reduction of skipjack volumes caught over the last 3-4 months, and increased raw material prices, the boat owners concluded that continued reduction measures were needed to June to ensure a balanced supply and demand, and to create a normalised market.

The reduction period up to June 2001 was found especially needed because yearly catch and market data show, that in the western Pacific (world's most important skipjack resource) skipjack catches from April to June tend to be higher than average. In order to preserve the positive trend of restoration of the balance between supply and demand, and the improved frozen tuna prices, tuna boat owners found it necessary to continue reduction in the western Pacific during this high season.

(Source: INFOFISH *Fishing Technology Digest* for Asia-Pacific • Jan–Mar 2001)

GETTING SERIOUS ABOUT CIGUATERA

What are the gaps in knowledge about ciguatera, the poisoning caused by eating neurotoxins sometimes present in the flesh of tropical marine fish?

Staff from Seafood Services Australia (SSA), the Queensland Department of Primary Industries Centre for Food Technology and the National Centre for Environmental Toxicology, organised a workshop in Brisbane to identify the research priorities.

The aim was to generate interaction between researchers and other stakeholders to resolve issues resulting from ciguatera.

Participants agreed it was the first coordinated effort to develop a strategy to manage the risk of ciguatera to the community.

The problem

Significant contamination of high-value reef and pelagic fish by ciguatoxin occurs in northern Australia and other tropical waters.

This creates a threat to public health and also to the fishing industry in terms of product quality and sales. The recent destruction of big quantities of potentially ciguatoxic fish in Hong Kong has highlighted the threat to Australian fish exports.

Workshop participants included acknowledged Australian ciguatera experts, representatives from major universities, researchers, industry representatives, health professionals, the Australia and New Zealand Food Authority and SSA.

Bill Aalbersberg from the University of the South Pacific gave a South Pacific Ocean perspective. Richard Lewis from the University of Queensland detailed current knowledge and outlined some of the gaps. Among research needs identified:

- A cheap, quick, simple, non-destructive test kit to identify low levels of ciguatoxin, suitable for use on fishing boats;
- A supply of purified ciguatoxin to help develop this kit;
- Performance in Australian conditions of rapid test kits developed overseas;
- Relationship between ciguatera and species, size, toxic characteristics etc;
- Relationship between time and toxicity in fish – anecdotal evidence suggests fish can self-depurate;
- Possibility of testing fishes' feeding environment for presence of the toxin;
- Markers to test for other than the toxin; and
- New treatments for people poisoned.

Reg Warren from Queensland Health said that epidemiological data were difficult to interpret because of poor information-gathering strategies. This was endorsed by Mike Capra from the Queensland University of Technology, who outlined survey results showing that understanding of ciguatera was low in the community and in the medical profession.

Clarrie McGibbon from M & M Fisheries told of an acquaintance affected by ciguatera who now could eat neither seafood, pork, nor chicken – raising new questions about directions for research.

A working party was formed to develop a strategy to attract research funding. Participants are continuing work in their areas of expertise and will report progress at a second meeting next month.

(Source: *R & D News*, volume 9, number 1 • January 2001)

■ FRENCH POLYNESIA'S FISHING INDUSTRY MAY TRIGGER REVOLUTION

Over 150 tuna fishing vessels are expected to be operational in French Polynesia's economic waters within the next five years with an anticipated yearly catch of 35,000 tonnes, daily newspaper *Les Nouvelles de Tahiti* reports.

In an interview with *Les Nouvelles*, joint venture Tahiti Nui Rava'ai general manager Pierre Teriitehau said the fleet will mainly fish in the north of French Polynesia's exclusive economic zone (EEZ), which covers an area of some five million square kilometres.

Teriitehau said since the number of fisheries-related available jobs (direct or indirect) will be multiplied by three, this is "a true economic, social and cultural revolution" French Polynesia would face shortly.

As part of its economic reconversion after French nuclear tests ended early 1996, the French territory plans to radically beef up its fishing capacity and build 56 new vessels.

Tahiti Nui Rava'ai was set up especially for that task. During a "private" stop-over early April in Tahiti, Chinese President Jiang Zemin and his French Polynesian counterpart Gaston Flosse mentioned a possible deal to build the vessels in Chinese shipyards.

"We talked about possibilities for French Polynesia to order a whole fleet of fishing vessels," Teriitehau recalled. "This is about a hundred tuna fishing vessels. This is part of a plan of our government to set up a proper tuna fishing industry within the next five years.

"Why China?" he asked. "Because we have issued a request for tenders and it seems

China is the country that would be in a position to provide good quality and cheap boats. On this subject, the President has invited me to visit China at a convenient time."

In the region, Fiji Islands shipyards had also expressed interest in bidding for the lucrative market. Soon after international tenders were issued, the first contract was signed early January 2001 between Tahiti Nui Rava'ai, and Chantier Naval du Pacifique Sud (CNPS, South Pacific Shipyards).

Teriitehau said the whole fleet will be made of three types of vessels: 14 will be l5 metres long, 10 will be 25 metres long and 32 will be 26 metres in length. The first two categories are to be built locally by CNPS, but the 26-metre type (to be equipped with freezers) is to be built by an overseas shipyard.

Authorities said an international tender would be launched soon, calling for builders to express interest in the multi-million dollar market.

Tahiti Nui Rava'ai was formed last September with a capital of nearly two million US dollars for the purpose of boosting tuna fishing in French Polynesia's territorial waters.

French Polynesia President Gaston Flosse is a strong advocate of the project (funded by the European Investment Bank, the French Development Agency (AFD) and a private bank, Socredo). The vessels should also benefit from a tax exemption granted to structural and development investments in French overseas territories.

The ultimate goal is to increase the yearly tuna catch volume by 15,000 tonnes.

According to plans, 23 vessels should be built in 2001 and 2002 for a total of 2.5 billion CFP (around 20 million US dollars).

The remaining 33 vessels would be built between 2003 and 2005 for a total funded value of over four billion CFP.

Tenders for local builders are expected to close by the end of March. The international call for bidders has raised interest from many builders, including China, France, Spain, Romania, Poland, but also in the region: Australia, New Zealand and Fiji.

Last year, Shipbuilders Fiji Limited shipyard completed a first series of 13-metre fishing vessels for French Poly-nesia under a European-funded project.

(Source: Oceania Flash, 19 June 2001• SPC)

FEASIBILITY STUDY ON COASTAL FISHERIES MANAGEMENT AND DEVELOPMENT TO BEGIN

A project for the Coastal Fisheries Management and Development in Papua New Guinea is being developed and feasibility studies are now in progress.

Mr Robert Lindley, a specialist on Institutional Strengthening and Human Resource Development, is in the country to commence preparatory and planning work on the proposed project.

A team of technical specialists and advisors will be arriving in July 2001 to carry out an extensive study into the anticipated loan project. They will have consultations with fishery participants and stakeholders, including representatives of the public sector, the private sector, resource users, and custodians and non-governmental organisations.

These and other interested groups will be consulted during the course of the study and will be encouraged to become full participants in the development of the anticipated loan project. Joint meetings and workshops will be convened both in Port Moresby and in the provinces to help share information and reach consensus on important issues.

Initial consultations and research will focus on a national assessment of fishery development potential and constrains. This will be used to select provinces that appear most appropriate for targeting during the study.

A thorough investigation of customary marine tenure issues, and ways in which they can be accommodated within the proposed project will be an essential part of the study.

The project will be funded by the Asian Development Bank and will concentrate mainly on:

- Institutional strengthening at the provincial and local levels;
- Rural fisheries development; and
- Infrastructure development.

A number of issues have been identified within the area of provincial and local-level institutional strengthening to which special attention will be paid.

The issues are:

- Establishment of provincial and local fishery advisory committees;
- Promotion of stakeholder associations;
- Small business development;
- Capacity-building within governments;
- Co-management; and
- Enhancing the role of non-government organisations.

Mr Lindley said the final report on the project proposal will be presented to the Asian Development Bank in September.

(Source: *Fishing Line*, issue no. 2 • June 2001)

THE PAPUA NEW GUINEA NATIONAL OBSERVER PROGRAMME

The Programme was established in 1996 in recognition of the need to coordinate and improve the level of monitoring in Papua New Guinea's expanding tuna fisheries. Prior to this, there were only a few scattered observer trips carried out in various fisheries by the National Fisheries Authority (NFA) and Fisheries Technicians.

With the recent restructuring of the National Fisheries Authority into a service provider, it was recognised that domestic as well as foreign fisheries must be monitored. Therefore, the National Fisheries Authority must now ensure that there is sufficient quality data that can be made available to the researchers it contracts to meet its stock monitoring needs.

The management team will develop policies and procedures to ensure that Observer Programme objectives are fully supported.

These objectives are:

(a) To develop national standards and policies to improve quality of data collected;

Deirdre Brogan

Deirdre Brogan

Observers at work, collecting biological samples and measuring fish

(b) To develop funding and support mechanisms; and

(c) To pr
for timely delivery of data to appropriate parties.

The Manager of the Observer Programme Team is Mr Noan Pakop based at NFA headquarters in Port Moresby.

Two Senior Observers are based at each of the six major fishing ports in the country: Wewak, Port Moresby, Rabaul, Kavieng, Madang and Lae. These Senior Observers are supported by several Fisheries Observers at each port. The number of observers allocated to each port depends on the level of fishing activities. Senior Observers and Fisheries Observers contract their services to the NFA on short-term contracts.

To be eligible for recruitment as an observer, the individuals must meet the minimum levels of education and training that are described in a recently prepared manual called "Papua New Guinea National Standards for Training and Certification of Fisheries Observers and Port Samplers."

This manual aims to provide a framework for training and certification of Fisheries Observers and Port Samplers. It facilitates the acquisition of reliable technical, regulatory and scientific data for use in the management of fisheries under the jurisdiction of Papua New Guinea.
It promotes the principle of improved performance through transparent competitive procedures The guidelines also address the role of regional structures, concepts of regional harmonisation and respect for the concerns of the fishing industry.

The Role of the NFA Observer Manager

His role includes budgeting, reviews and evaluations of existing programme activity with respect to cost efficiency, effectiveness and coverage levels. The Manager also examines standards for insurance, data confidentiality and storage, hiring, training, safety and contracting.

Efforts are undertaken:

1. To modernise data collection techniques;

2. To achieve a suitable balance between the needs for data and the cost to industry of its collection; and

3. To integrate observer data with other programmes.

Future goals of the NFA Observer Programme

The NFA Observer Programme will open the process to include all stakeholders and create partnerships with agencies to meet common data needs; it should provide for a timely and widespread dissemination of observer data to the fishing industry and the public; it must work toward creative cost recovery mechanisms and the development of standards and policies that enhance effectiveness and minimise costs.

Why do we need Observers?

We need Observers to:

- Provide quality data on all aspects of fishing activities (biological, environmental and socio-economic) for fisheries science and management;

- Monitor vessel compliance with PNG's Fisheries Regulations and other environmental laws; and

- Provide a means for verifying the data collected from other sources such as logbooks and landing reports.

The Work of Observers

Observers provide data on species-composition of catch and bycatch, estimates of gear, vessel and gear characteristics, fishing locations, biological samples, and environmental parameters for normal fish stock monitoring purposes.

Observers may also assist in the National Fisheries Authority sponsored research projects, collecting biological samples for stock assessments and genetic studies, tagging and releasing fish and also in a variety of other research activities when not directly monitoring fishing operations.

The various PNG fisheries currently fuctioning with Observer coverage include, both foreign and domestic single purse seine and mothership purse seine operations, domestic longlining, prawn trawl and lobster fisheries, and experimental scad fishing. Observers were also monitoring live reef food fishing activities. They were also monitoring the shark longline fishery until the moratorium was imposed in December 2000.

(Source: *Fishing Line*, issue no. 2 • June 2001)

omote mechanisms

HOOKED ON CANNED TUNA

Food fads come and go as quickly as a summer rainstorm, but tuna salad has staying power. Sandwiched between two slices of bread, this all-American favorite is as popular today as it was in the 1950s. "Tuna is an American staple," said Michael Mullen, spokesman for Heinz North America, owners of StarKist tuna. "We love our tuna."

Sales figures back the claim. Americans consume one-third of the 2.2 billion cans of tuna sold annually across the world, which equates to 500 million pounds of canned tuna eaten every year in the United States, according to StarKist, the world's largest supplier of packaged tuna.

"It's better-tasting than other canned foods, and it's something you can keep in a kitchen cabinet and pull out for lunch or dinner," said Barbara Pool Fenzl, owner of Les Gourmettes Cooking School in Phoenix. "You don't have to run to the store if your refrigerator is empty."

It was 80 years ago that Americans opened their first cans of tuna. The original oil-packed fish was eaten plain. Open the can, drain the oil and place the tuna between two slices of bread. Although inexpensive and nutritious, the original sandwich was an underachiever. This changed in the late 1940s after marketing executives from the three top tuna canneries — StarKist, Chicken of the Sea and Bumble Bee — decided tuna could use a little something extra.

In a never-to-be-repeated collaboration, representatives of the three tuna giants experimented with mixing mayonnaise with the fish. Voilà — the classic American sandwich was created. This mayo-tuna mixture quickly became a Friday regular in school lunchrooms, and a perennial favorite in diners and kitchens nationwide.

"Most of us grew up eating tuna salad sandwiches, so it's actually a comfort food," said Robert McGrath, award-winning chef and owner of Roaring Fork Restaurant in Scottsdale. "It's one of those foods that even people who don't like eating other fish like."

Tuna sandwiches enjoyed popularity and an unblemished reputation until a public scolding in 1995 by the Center for Science in the Public Interest. The consumer watchdog group called the sandwich, with 43 grams of fat, a heart clogger. Unfazed, tuna lovers shrugged and opened another can for lunch.

"We never saw sales decrease by the (bad) publicity," Mullen said. "People just aren't willing to give up their tuna, and they understand you can cut back on the fat by using low-fat mayonnaise or dressing. It's not the tuna that's unhealthy."

According to health experts, tuna is one of nature's best sources of omega 3, a "good" fat that may be beneficial by helping to lower the risk of heart disease. A 2-ounce serving of high-protein albacore tuna has 1 gram of fat, compared with 4.5 grams of fat for chicken breast and 10 grams for lean ground beef.

Tuna straight out of the can remains a high-protein, low-fat favorite of bodybuilders and dieters. Most of us, however, add mayonnaise and other ingredients, such as celery, hard-boiled eggs, onions, water chestnuts, pickles, relish and olives. Mayonnaise dressing is perked up with mustard or spices such as dill, summer savory, paprika, lemon balm, parsley, thyme or cumin. For additional variety, change the bread, from sourdough to toast, pumpernickel to rye, onion roll to pita. Consumers now have a record number of tuna styles available. There are albacore and chunk white. There's tuna packed in spring water or oils.

"Those that are health-conscious go for the tuna in water, while chefs concerned about taste go for tuna in oil," Mullen said.

Food experts generally agree that tuna packed in canola oil has a better flavor and texture profile than tuna packed in water. And here's a surprise: Tuna packed in canola oil mixed with 1 tablespoon of mayonnaise is actually lower in fat than tuna packed in spring water and mixed with 2 tablespoons of mayonnaise.

Choices for consumers increased last year when StarKist introduced the latest version of the standby — tuna in a vacuum-packed pouch. This tuna is fresher, tastier and requires no messy draining from the can. At about US$ 2.99 for a 16-ounce pouch, it is more expensive than tuna in the can, but Mullen said consumers appear willing to pay the price for the convenience. Tuna ranges from 39 cents for a 6-ounce can on sale to US$ 3.19 for a Bumble Bee pack containing tuna, dressing and crackers.

"Consumers keep telling us how important convenience is to them," Mullen said. "Now they don't have to mess with opening a can and draining tuna. The convenient food is getting more convenient."

(Source: *WorldCatch*, 8 August 2001)

THE SAMURAI FISH CUTTERS OF OSAKA CENTRAL MARKET

by Steve Beverly,
Fisheries Development Officer,
SPC, Noumea,
New Caledonia

While passing through Osaka, Japan, on his way to Saipan, CNMI, Fisheries Development Officer, Steve Beverly, called in at the Osaka Central Market and observed some unique fish cutting techniques.

Sashimi tuna fish cutters are somewhat like tuna fishermen, each has his own style and techniques, although the end result is usually similar: plenty of fish and plenty of good sashimi. Western methods of catching sashimi tuna are largely borrowed (and modified) from the Japanese longline fishermen.

The Japanese style of cutting sashimi tuna, however, is very different from anything that Steve has seen before, other than in Hawaii. For one thing, the fish cutters in Osaka use long, sword-like knifes for most of the cutting. These knives, in addition to being long (up to 36 cm) are sharpened on one edge only and have relatively long handles. They look similar to samurai swords.

Westerners tend to use smaller butcher-type knives that are sharpened on both edges. The other major difference is in technique. Most of the Central Market fish cutters placed the fish on one side and left it in that position for all of the loining cuts. In other words, the top loins were removed skin-side up, while the bottom loins were removed skin-side down, after the frame had been removed.

Most Western fish cutters would turn the fish over after removing the two quarter-loins from one side. In Tahiti, fish are hung by the tail and the loins are cut away from the hanging frame (see *Fisheries Newsletter* #90). The following sequence of photos shows the entire process of quarter-loining a sashimi tuna—Osaka style.

Steve Beverly

Sashimi grade tuna fresh from the auction floor

Steve Beverly

First, the gill cover is cut down to the skull

Next, the head is removed with a tuna saw

Steve Beverly

Steve Beverly

The pectoral girdle (gill colar) is then removed from the trunk

The belly quarter loin is removed by first cutting along the belly to the backbone going from the tail forward

Steve Beverly

Steve Beverly

Then a cut is made on the side to the backbone following the lower boundary of the blood line and pin bones and going from the tail forward

The result is a clean-cut quarter loin

Steve Beverly

Steve Beverly

The top quarter loin is removed in much the same way except that the pin bones are cut through and then removed from the quarter loin afterwards along with the blood line

The dorsal and anal fins and finlets are then cut away from the remaining half loin, without turning the fish over

Steve Beverly

Steve Beverly

The frame is then cut away from the remaining half loin by cutting through the pin bones, again without turning the fish over

Steve Beverly

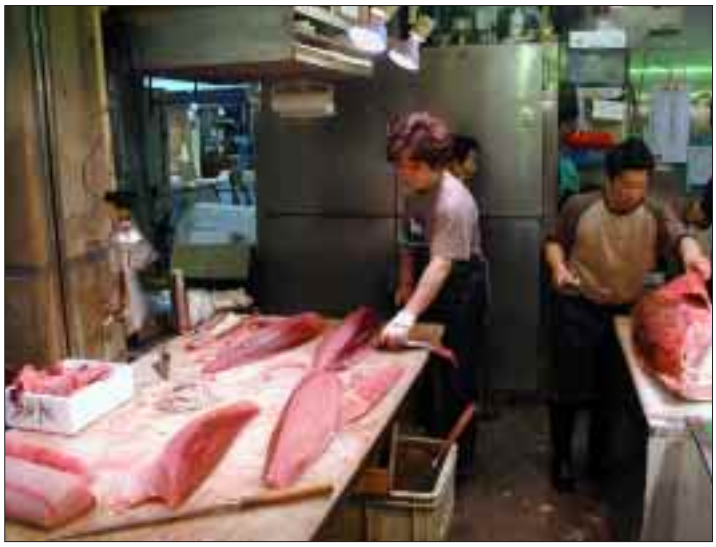
Next the half loin is split into two quarter loins

Pin bones and blood line are cut away from these two loins as well

Steve Beverly

Steve Beverly

The belly flap is cut from the lower loin



Steve Beverly

After trimming, the quarter loins are ready for packing

Steve Beverly

Before being shipped, each loin is wrapped in absorbent paper and placed in a plastic bag. A small vacuum is used to remove all air from the bag.

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