

Journal of
MICRONESIAN FISHING

Fall 2009

**Successes and challenges
of community-based
marine protected areas**



INSIDE: Tuna Fishing on Saipan: *A Look Back*
How Old is that Fish?, Fishermen Talking Story and More



(Above) A military government fishing boat prepares to offload its catch of skipjack tuna, circa 1946. Photo courtesy of the U.S. National Archives.

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It is dedicated to working in partnership with Pacific nations, states, and communities to assess, monitor, and manage their precious biological resources for sustainable use.

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Cover Photo:

*Dedication of surveillance
platform by the Nimpal Zone
communities - July 10, 2009*

Photo Courtesy of Nimpal Project

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EDITOR'S PERSPECTIVE: MARINE CONSERVATION

For numerous years now, scientists have been reporting that reserves, also commonly identified as Marine Protected Areas, or MPA's, are necessary, but not sufficient for marine conservation. This expresses the philosophy shared by many Pacific Island societies that encompass a traditional, ecosystem-level approach towards managing resources. Although it is essential to establish reserves, further measures to reduce overfishing and pollution are necessary to best prepare our coral reef ecosystems from two major cascading stressors: 1) CO₂ input into the atmosphere, and 2) economic demands of a growing human population. Both represent ratchets, or self-reinforcing mechanisms that build upon themselves.

Herbivorous fish and urchins are key. Science continues to report that without sufficient grazing by herbivores, reef assemblages take much longer times to recover from natural disturbance cycles, or may not even recover at all. An example of how traditional knowledge and management incorporates these concepts comes from Tommy Remengesau, the Vice President of Palau at the time of the extensive and severe coral bleaching event of 1997/98. He placed a request in the Palauan newspaper to the citizens, asking them to reduce or stop their take of herbivorous fishes during this critical time. In this way, the citizens of Palau were asked to make a broad-scale effort to facilitate coral recruitment and recovery. The Palauan reefs looked very well recovered in 2005.

A similar process occurred in Bermuda where extremely high uptake of CO₂ in the North Atlantic has decreased



(Above) Editor's Perspective author, Charles Birkeland. Photo courtesy of Charles Birkeland. (Right) Herbivorous fish at work. Photo courtesy of John Starmer.



the ability of coral to grow and reefs to form (25% reduction in the past 50 years). However, the reefs are doing fine. Herbivorous reef fishes are abundant because in 1990, the Bermuda Chamber of Commerce convinced the government to take measures that protected parrotfish and other herbivores.

In July of last year, the 11th International Coral Reef Symposium (with over 3,000 coral-reef scientists from 75 countries) gave a Call to Action for a worldwide ban of the harvesting of herbivorous reef fishes for sale and commercial consumption in an effort to enhance coral-reef resilience in the face of climate change and ocean acidification.

Together, Micronesian societies must encourage greater responsibility in managing reef resources. Political will and motivation for responsible management can be restored when the local community is given authority to make management decisions. Over the past few years on some Pacific islands there has been a restoration of community-based resource management and resistance to global economic domination. Vanuatu recognizes customary marine tenure of villages in its constitution. Independent Samoa recognizes village regulations as legal

bylaws. Indonesia, Philippines, Papua New Guinea, and the Solomon Islands have decentralized resource management authority, empowering local communities to take the lead role. Inside this issue we learn of a similar story on Yap Island where traditional leaders are taking the initiative, and empowering the community, to adapt to the main stressors described above. However, what does the future hold for the rest of Yap and Micronesia?

Over the years I recall several Micronesians stating, "The resources of our island do not belong to us, we are borrowing them from our children and our future generations". The bottom line is that, yes, there is a need to improve our global focus upon reducing CO₂ emissions and the demands that larger human populations encompass. While maintaining a vision of these large-scale ratchets, local actions must be taken to increase the number and effectiveness of marine reserves, reduce sedimentation, overfishing, and pollution. This will best be accomplished through empowering management decisions at the local level.

- CHARLES BIRKELAND
Adjunct Associate Professor
Department of Zoology,
University of Hawaii at Manoa

How old is that *Naso unicornis*?

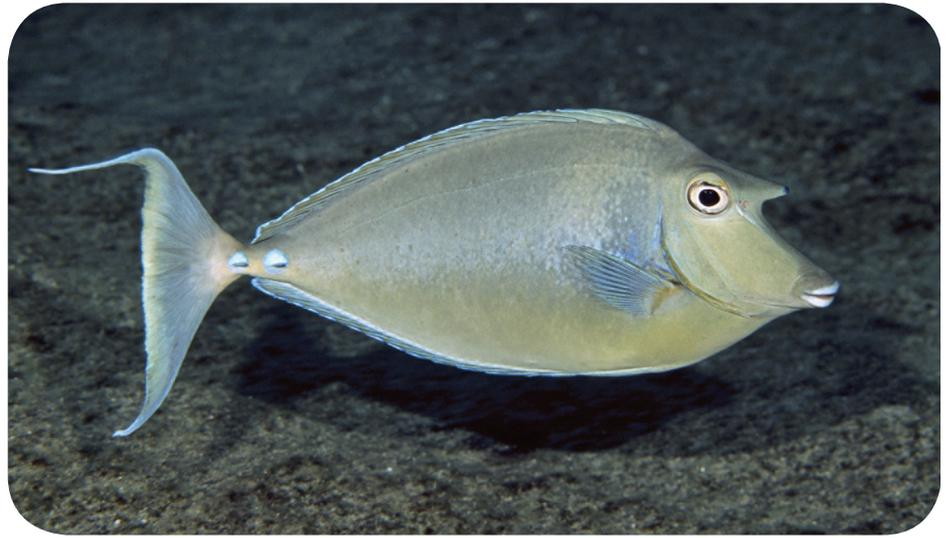
BY JEFF A. EBLE

I was astonished by what we had just found: a 58 year old blue spine unicornfish! For the past several months we've been working with Hawaii's Division of Aquatic Resources to learn more about unicornfish including how fast they grow, when they become sexually mature, and how long they live. We knew some fish, like California's orange roughy, can live to be over 100 years old but we didn't know what to expect for this popular fish since so few tropical species have been studied.

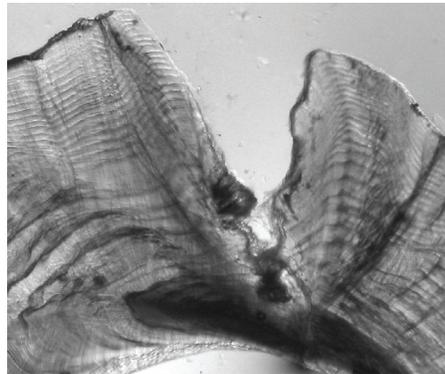
Come to find out, our 58 year old unicornfish wasn't alone. Out of the nearly 200 fish that we looked at we found another that was 51 years old and a dozen that were in their 30s, all of them collected commercially off windward Oahu.

In a way, fish are like trees; you can tell how old they are by counting their rings. Every year as temperature and food availability changes with the seasons, a pattern of dark and light bands form within the fish's ear bones. These bones are called "otoliths" and while they are designed to help the fish hear, they also can help scientists discover how many years it will take for a fish to reach its maximum size.

This is important because fish tend to have a maximum size, after which they generally stop growing. Instead of getting longer, they usually just get fatter, kind of like us humans. For unicornfish, the maximum size appears to be around 20-inches from tip of the nose to middle of the tail, a measurement called fork length. It will take an average unicornfish about 6 or 7 years before they reach 14-inches fork length and 15 years before they reach their maximum size.



(Above) sub-adult blue spine unicornfish. Photo courtesy of Keoki Stender*; (Below) Prepared section of an otolith from a 25-year-old unicornfish. Photo courtesy of Jeff Eble.



But here's where it gets tricky. While male and female unicornfish grow at more or less the same rate, they don't mature at the same age. Males are generally ready to spawn by the time they are 4 years old but females mature more slowly and aren't ready to spawn until they are 7 or 8 years old, which equals about a 15-inch fork length.

Luckily, not all reef fishes take so long to mature. Drs. Alan Friedlander and Paul Dalzell reported that giant trevally will first spawn at 3.5 years and that blue-fin trevally are ready to spawn as early as 2 years. One thing trevally and unicornfish do have in common is that as they grow bigger they spawn more frequently and produce more eggs per spawning event.

Professor Charles Birkeland has highlighted recent research indicating "older fish produce exponentially more eggs". As an example Birkeland pointed to trevally where one 27-inch female will produce as many eggs as eighty-six 14-inch fish. And it's not just that one big fish will produce more eggs than a boat-full of small fish; Dr. Birkeland noted that they also produce better eggs that in turn leads to larvae that grow faster and have a higher chance of survival.

So what does this all mean? A recent survey of twenty-five different kinds of marine fishes found that a population will produce more young and therefore sustain more fishing if it is made up of big old fish rather than lots of smaller fish that have less reproductive capacity. Their conclusion— if we want a sustainable fishery we should aim for the mid-sized fishes and let the really big ones go.

This work was supported by the **Hawaii Division of Aquatic Resources** and the **Fisheries Local Action Strategy**. Funding was provided by the **Federal Aid in Sport Fish Restoration Program**. *Photo credit: www.marinelife-photography.com

Fishermen Talking Story

*Interview with
Roman C. Benavente*

Fisherman from Saipan

INTERVIEWED BY
PETER HOUK

Who taught you:

Dad – Dad was fishermen, farmer, and some governmental-job income. Been fishing with my father, myself, and now my kids for nearly 40 years. I learned by going out with my dad and just quietly watching and learning, and doing what I was told. This is similar to the way I taught my kids.

What types of fishing did you mainly do with your dad:

In the beginning we were focused upon all kinds of fishing – nets, spears, night, day. One unique style of fishing we practiced was called ‘Sulu’. This is when you go out and get a bamboo, break the ‘inbetweens’, and fill it up with kerosene to make a torch. This was very traditional, we only did this at the extreme low tides when no moon was out.

I think the knowledge surrounding when to use this technique has been mostly lost.

If there was unwanted texture on the water while searching for fish you would chew coconut and spit onto the water, and the oil would smooth the water and enhance our sight of the fish.



(Above and Right opposite page) Roman Benavente Talaya fishing at Laolao Bay. Photos courtesy of David Benavente.

What was your personal fishing practice of choice:

Currently, my primary fishing technique is throwing net “Talaya”. I like it, it’s a sport, I feel relaxed while doing it, you have to learn patience and skill. Its like a stress reliever for me.

“I have seen the consistent decrease in the amount and sizes of fish being caught since the 1990’s.”

Can you think of a time when an outstanding catch was made:

About 5-7 years ago. Out in the front beach near San Antonio village, out on the reef crest. For some reason

the school of rabbitfish, each 12” long, was aggregated together. I had a 14’ and a ~10’ net both. I saw this huge school coming over from far away, about 14’ in diameter, and the line of fish seemed to continue forever. I positioned myself in the channel to block it, then cocked my big net.

Once they were close enough I tossed the net, which open up to a 28’ diameter....the entire thing was filled with black! The remaining school didn’t even run that far, they just seemed to regroup and head again towards me.

I continued to block the channel, and cocked my smaller net....the entire thing was again filled with black. My cousin and I were killing and picking fish from the net from 4 p.m. until well beyond dark, altogether ~300 lbs in two net throws. I never experienced anything like that in my lifetime.

Do you sell your fish:

Just about all the time I do not, and have not, sold fish. I prefer to pass it out to my family because it tastes best when its fresh.

Have you noticed change over time in your fishing spots and catches:

I have seen the consistent decrease in the amount and sizes of fish being caught since the 1990's. The rabbitfish, some surgeonfish, and adult goatfish are two that are most noticeable.

This change was most pronounced between the late 1980's and early 1990's. Some of the strongly seasonal fish, such as 'Tataga', or unicorn fish, you still can catch, but you have to know the time, tide, season, and moonphase. I attribute this to the increase in net fishing, not just the 'Talaya' fishermen (thrown nets), but the long nets too.

"I like it, it's a sport, I feel relaxed while doing it, you have to learn patience and skill. Its like a stress reliever for me."

What type of management do you think would best help our fishery resources:

Well the protected areas do a good job of improving our stocks in the specific location, but there is no access for fishermen, and we are not seeing more fish on surrounding reefs, so of course not everybody is happy. So, perhaps create rotational protected areas whereby seasonal harvesting can be conducted, and then the areas will be closed for the remainder of the year.

Any other comments or problems you see with our fishery:

One of the major problems with our local fishing industry here is that I think some people are still using SCUBA to catch more than their share of our fish.

I think enforcement has to be more strict to manage that concern. Also, perhaps consider limiting the sizes of the fish people are catching.

One positive example is the gill net ban. Ever since fish and wildlife banned the gill nets it has helped a little to improve our stocks, that is what I see.

We need more beneficial management.



Sharing the success and challenges of community-based marine protected areas

Nimpal Community, Yap



BY BERNA GORONG

Over the years, fishermen from Okaw and Kaday villages, that together encompass the Nimpal community, watershed, and channel, observed a decline in the abundance of fish within their traditionally-owned fishing grounds. As the years and discussions rolled by, the observed decline continued.

Clearly the community fishing grounds were being fished out. But what was the main problem? The root is the decaying of traditional practices and norms. Traditionally, regulations existed for all community members that dictated where and when fishing could occur and the type of fishing methods that could be used.

Nowadays everyone who has the means and desire to fish does so as they like. Even further, community members are no longer just fishing for personal consumption or community obligations; but rather the fish being taken from the fishing grounds are often sold to earn an income. Tradition

alone was no longer able to protect the fishing grounds.

So in 2005 during one of the men's village meeting it was highlighted that if the situation continues and nothing is done to address it, future generations will no longer have anything left in their fishing grounds to sustain them. It was decided to look outside the communities for viable mitigation solutions.

In 2006 with the technical assistance of the Yap Community Action Program and their partners, an effective design for a conservation area was agreed upon by the Okaw and Kaday villages that included the Nimpal Channel and adjoining inner and outer reefs. This area accounts for approximately 77.5 hectares, or a about a third of the two villages traditional fishing grounds put together. The area was designated by the communities as a no-take zone until such time that the communities so decide to change the status.

In May 2008, an official step was

taken by the two villages to publicly announce their decision, and have the village chiefs officially sign the Nimpal Channel Marine Conservation Area Declaration.

Despite the official demarcation, it has not been easy to gain the full support of the fishermen in the community.

When the conservation zone was first demarcated in 2006 there were still reports of fishing, evidenced by the lights in the MPA at night. Certainly the buoys were hard to see at night, however, no one in the community was taking it upon themselves to patrol the area at night. Even though a village decision was passed down, there were still a few within the communities who try their luck since they know no one was really patrolling the area. The community did not own a boat or other means to fully observe and enforce the no-take policy.

Although small grant funding secured in 2006 was used to get our actions this far, the funds were not

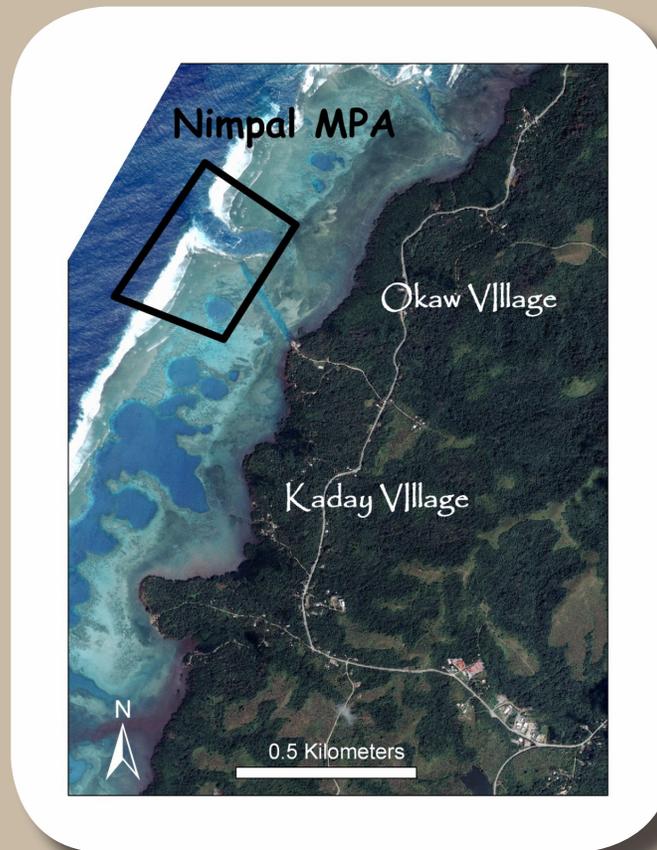


(Above) Dedication of surveillance platform by the Nimpal Zone communities - July 10, 2009 - Photo courtesy of Nimpal Project; (Below) An aerial view of the marine protected area. - Photo courtesy of Peter Houk.

enough to support the procurement of an enforcement boat. Yap is a small island community and most fishermen know who owns boats and where they are located. An MPA area without an enforcement and reporting boat assigned to it is open invitation for poachers.

Over the next two years the MPA continued to gain community support, however the occasional poachers were persistent but infrequent. Despite the low level of poaching, within two years of the community closure fishermen were already talking about a positive effect in regards to the fish being caught in the surrounding areas, and the joint community-YapCAP monitoring data supports that fish are returning to the MPA, statistically so.

Striving for complete closure of their MPA from fishing, the community group was able to secure a grant from



NIMPAL COMMUNITY MPA
CONTINUED ON PAGE 10

the Conservation and Environmental Protection Program (Funded by the European Union and administered by the Micronesia Conservation Trust) to support surveillance and enforcement in 2008.

With the funding, the community has been able to:

1. Build a surveillance platform that can be moored near the zone for surveillance teams.
2. Activate joint-community surveillance teams to monitor the site, especially at night when more fishing activities took place, and
3. Install solar lanterns on the corners of the no-take zone to improve visibility of the closed area at night.

This helped reduce the chance of unintentional intrusion by community fishermen fishing at night and it also improved monitoring of the site by community surveillance teams.

However, the community group continues to search for means to acquire a boat to support surveillance and enforcement activities.

In retrospect, we often wondered why some MPA's around Yap and other Micronesian Islands where our families live, work, and some don't seem to.

“The root (of our problem) is the decaying of traditional practices and norms.”

We believe the design of the conservation area is a preliminary key for effectiveness to be achieved.

But equally important is the community commitment to the decisions made, as long as community support and leadership remains, conservation efforts will continue to succeed. Keeping everybody informed and involved was our ultimate key to success.

However, we are well aware that our

work is not done. Changing lifestyles within the community is an issue that needs to be addressed since it is directly linked to the root cause.

As people continue becoming more dependent on a cash economy to support their lifestyle, many will continue to exploit the only available resources to them to get cash.

Educating our community as to the consequences of these new lifestyles is something that looms big for traditional leadership to undertake. Creating alternative income generation activities that are environmentally sustainable is one ongoing effort that helps.

Times are changing and our people's needs and mindsets are changing. Active community leadership with a vision and community cohesiveness is vital.

(Below) Two communities working together to build a surveillance platform. (Opposite page) Nimpal MCA Core Group during monthly project implementation meetings.- Photos courtesy of Nimpal Project.





Commercial Tuna Fishing on Saipan: *A Look Back*

BY SCOTT RUSSELL

Most people will tell you that commercial tuna fishing started on Saipan in the 1970s with the advent of fiberglass boats and outboard engines. Only a few elderly residents who grew up during the Japanese administration know that commercial fishing actually began just after World War I, and that the equipment and techniques originally employed were much different than those used today.

The industry was established by Okinawan fishermen who migrated to Saipan in the early 1920s, only a few years after the Northern Mariana Islands had been awarded to Japan as a part of a League of Nations mandate. Fishing was an attractive business for hardworking men of modest means in depression-ravaged Okinawa because it did not require a large outlay of capital to get started. All a group needed was a wooden boat, basic fish-

(Above) Fishermen work a school of skipjack tuna circa June 1945. Photo courtesy of the U.S. National Archives.

ing gear, and a spot on shore where the tuna could be processed. These pioneering fishermen were aided by financial subsidies offered by the Japanese colonial administration as a part of the government's efforts to stimulate economic development in the newly acquired territory.

For the first ten years or so these independent fishermen had the industry to themselves, but by the mid-1930s they were eclipsed by a number of companies which became involved in commercial fishing on a more substantial scale. The largest among these were *Nankō* (South Seas Development Company), *Nambō* (South Seas Trading Company) and the *Nan'yō Bussan* (South Seas Products Company). These companies were attracted by the NMI's untapped marine resources and were prepared to invest

the necessary financial resources to significantly expand the industry.

By the late 1930s, Saipan's fishing fleet comprised a dozen diesel-powered fishing boats measuring roughly 60 feet long and 12 feet wide. These wooden craft weighed about 20 tons empty and were fitted with retractable masts that could be used in cases of engine failure. The fleet was maintained by professional shipwrights who were employed by the fishing companies that were based in Garapan, Saipan's principal settlement.

Although there was some long line fishing for Yellowfin, the bulk of the catch was made up of skipjack tuna (*Katsuwonus pelamis*) called *katsuo* in

COMMERCIAL TUNA
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(Above) A diver plunges into rough waters to set an anchor line. Photo courtesy of the U.S. National Archives.

Japanese. A typical day of *katsuo* fishing started at 2:00 a.m. when a boat headed out to capture anchovy bait-fish (*Engraulididae*) that congregated in waters along cliff-fringed stretches of Tinian and Saipan. This dangerous task was carried out by loincloth-clad divers, equipped with only a pair of eye goggles, who swam along the rugged coastline in search of anchovy schools.

Once a suitable school was located, the divers anchored their boat parallel to land by a pair of ropes that they secured to rocks atop tide shelves that were often swept by large waves. These same skillful divers then deployed a large net from the side of the boat which was used to haul in the bait. Anchovies trapped inside the net were carefully scooped up in buckets and placed in bait tanks located amidships.

With sufficient bait on board, the captain set course for the fishing grounds, the best of which were located 10-40 miles to the west and north of Saipan. Once a flock of birds was located, the boat maneuvered across the head of the school and a team of men dipped anchovies from the bait tank and threw them into the water near the boat to attract and hold the fish.

Katsuo were caught by up to 14 fishermen, equipped with bamboo poles, who were positioned along both sides of the gunwales and at the stern. They used feathered hooks at first when the excited tuna struck at anything in the bait-filled water and then switched to barbed hooks baited with anchovies once the initial feeding frenzy waned. These men, who fished from a seated position, routinely held several extra anchovies in their lips to speed the baiting process. Most boats

also possessed a series of nozzles that sprayed water onto the surface of the ocean to encourage the fish to continue feeding.

An experienced fisherman was capable of catching nine to twelve tuna per minute when the run was at its height. Although the action rarely lasted for more than an hour, on a good day the boat's crew might bring in two tons of tuna during that period. With a full hold, the boat would head for home. Upon entering the harbor, the crew ran up large colored flags emblazoned with Japanese characters to signal the size of their catch.

While some tuna were sold to markets and restaurants, the bulk of the catch was processed for export to Japan as *katsuobushi* (dried, fermented tuna fillet). This required that the fish be cleaned, boned and boiled, and then dried and smoked for several weeks. The finished product was a rock-hard

block of fish, the shavings of which were used by Japanese housewives in soup and as a topping on boiled vegetables. *Katsuobushi* from Micronesia gained a reputation in Japan for its superior quality, and by the late 1930s it ranked among the top export items from the *Nan'yō Guntō* (Japan's South Sea Islands).

Although sugar cane agriculture generated the bulk of export revenues in the Northern Mariana Islands, by the late 1930s fishing had become an important industry in its own right. Saipan's fishing fleet brought in 25 tons of tuna a day during the prime season and employed several hundred workers including boat crew, shipwrights, and factory workers. By this time, larger fishing vessels, based in Japanese ports, were also exploiting the region's substantial marine resources. These boats would spend weeks fishing to the north of Saipan before returning home with their holds full of tuna.

War came to the Pacific in December 1941 following the Japanese attack on the American naval base at Pearl Harbor. During the early years of the war, the Saipan's commercial tuna fleet was able to continue fairly normal operations. This came to an abrupt end following the American air attacks launched against Saipan in February and April 1944. Saipan's fleet was subsequently destroyed dur-



(Above) Divers deploy the bait net near a school of anchovies. (Below) Returning with the day's catch. Photos courtesy of the U.S. National Archives.

ing the heavy bombardment of the island that preceded the American amphibious assault on 15 June 1944.

Japanese and local civilians who survived the savage three-week battle for Saipan were placed in internment camps run by the U.S. military. Feed-

ing thousands of internees proved to be a challenge as most of the food had to be procured locally. In an effort to provide adequate protein, the military government decided to resurrect the fishing industry, albeit on a much reduced scale.

The first task was to re-float sunken fishing boats scattered in the shallow waters off Puntan Muchot. Several damaged hulks were taken to the military shipyard where they were repaired and refitted with new American diesel engines. The reconditioned fleet operated out of the Military Government Fishing Base established just south of the old Japanese government pier in Garapan. This base consisted of an office building, cleaning



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COMMERCIAL TUNA CONTINUED FROM PAGE 13

shed and a small rubble pier that the Navy constructed to accommodate the fishing boats.

Daily operations were nearly identical to the pre-war routine. The only difference was that the fishermen now took their orders from a young American naval officer who served as the Officer-in-Charge of fishing. The fresh tuna brought in by the boats was a welcome addition to the camp diet that for the first few months following the battle had consisted primarily of canned foods.

In 1946 all Japanese nationals on Saipan were repatriated to their home islands. That same year a group of Carolinian men who were employed by the naval administration as policemen established a cooperative which was named the Saipan Fishing Company. The cooperative operated out of the former Military Fishing Base in Garapan and had at its disposal two reconditioned pre-war Japanese fishing boats and two small naval landing craft. Most of the Carolinian coop members had received training from the Okinawan fishermen before their repatriation and utilized pre-war techniques for catching tuna.

Skipjack tuna comprised roughly 80 percent of the cooperative's catch. The remainder included mackerel (*atuli*) and a variety species caught within the reef. The fish were sold to local markets and the remainder was exported to Guam. The cooperative continued operations until 1950 when bankruptcy forced its dissolution. A number of problems led to this end including reoccurring mechanical problems with the old Japanese boats, a lack of managerial expertise, and the inability to get fish to the major markets on Guam.

Following the failure of the Saipan



(Above) Crewman throws baitfish into the water to keep skipjack tuna near boat. (Below) Headquarters of the Saipan Fishing Company circa 1946. Photos courtesy of the U.S. National Archives.



Fishing Company, fishing on Saipan reverted to a traditional subsistence level undertaken largely within the fringing reef. Commercial tuna fishing would not re-emerge for another quarter-century until the advent of the modern tourist economy.

Today, the only reminders of these early days of commercial fishing on Saipan are a few faded photographs, the ruins of the old pier, and the name

“Fishing Base” still used by locals to refer to the Garapan dock.

Although their deeds may be forgotten, the spirit of these bygone fishermen is kept alive by a new generation of anglers that works hard to keep Saipan supplied with tasty treats from the sea.

From Catch to Kitchen

Contributed by Trina Leberer

adapted from the book "Taste of the Pacific" by Susan Parkinson, Peggy Stacy, and Adrian Mattinson"

Kokoda (from Fiji)

Ingredients:

A pound or so of yellowfin, wahoo, mahi, or whatever firm fish you like best cut into small cubes

Lemon or lime (or calamansi, etc.) juice enough to cover the fish. Marinate overnight in the refrigerator

Add:

One medium-sized onion, finely chopped

Tomatoes and cucumbers, diced (amount to taste)

Hot peppers (to taste)

Salt and pepper (to taste)



Chill for at least an hour for the flavors to blend, the longer the better.

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Contributions can be as simple as photos of your catch or as detailed as a transcribed interview. Mainly we are looking for stories (600-1200 words long) about fishing, cultural importance of fishing, management, community efforts, history, why Uncle Semo is the best fisherman ever, and related topics. JMF has an editorial staff that can help ensure that your message comes across clearly.

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Images may be sent as .jpg or .tiff files. English language submissions: 600 and 1200 words. Local language submissions up to 600 words.

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Science to help people effectively manage resources.



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