

The background of the cover is a photograph of a sunset over a calm body of water. The sky is filled with warm orange and yellow light, with some clouds. The water is still, reflecting the light from the sky. In the lower right, a small silhouette of a person stands in the water, creating ripples. The foreground is dark, with the silhouettes of trees and foliage.

Journal of
MICRONESIAN FISHING

Spring 2010

Fishing in Palau
over the years
a perspective from
Clarence "Obak" Kitalong

INSIDE: Local perspectives on traditional marine resource management, fishermen talking story, learning from our fish markets, and more

CONTENTS

Journal of MICRONESIAN FISHING

Cover Photo:

Cast net fisherman in Palau;

Photo Courtesy of John Starmer

Editors:

Peter Houk

John Starmer

Contributors:

Clarence Kitalong

Peter Houk

Lino Olopai

Cecilio Raiukiulipiy

Andrew Rapo

Gasma Nedlic

Sam Sablan

Page Designer:

Lisa Huynh Eller

This journal was prepared by PMRI under award NA07NMF4630113 from NOAA Coral Reef Conservation Program, U.S. Department of Commerce.



The statements, findings, conclusions, and recommendations are those of the authors and do not necessarily reflect the views of the NOAA Coral Reef Conservation Program or the U.S. Department of Commerce.

Printed by Elite Printing in Saipan.



Fishing Palau: Where a passion for fishing permeates. But are our fish stocks sustainable?
PAGE 6



Market-based Fish Surveys
PAGE 10

Local Perspective
PAGE 3

Letters to JMF
PAGE 4

Fishermen Talking
Story PAGE 14

From Catch to
Kitchen PAGE 5

LOCAL PERSPECTIVE:

Merging traditional knowledge, scientific insight, and marine resource management

By *Lino Olopai, Cecilio Raiukiulipiy and Andrew Rapo*

Throughout the Outer Caroline Islands, affiliated with Pohnpei, Chuuk, and Yap, resource management is simply a part of life and culture. There are no books of laws and regulations, no police, and no judges as modern society knows them today. Rather, there is a great deal of respect for each other, people care about people. This forms the roots for our way of life that inherently keeps management and conservation in mind. This is exactly why it is extremely difficult to answer the question that is so often asked to us, “what are the most common forms of traditional resource management that are practiced”?

We can tell you about how on Satawal, if you catch a prized and somewhat uncommon resource (a turtle or big Napoleon Wrasse), one must bring it to the chief and he will decide who, when, and where it will be prepared and consumed. Or, we can tell you about how all resources have a distinct seasonality, and our culture has ceremonies and taboos that manage these special events when food becomes plentiful. But the bottom line is that our ancestors have lived for thousands of years on these tiny islands in a sustainable manner, and no single rule can explain successful, happy life.

Modern times, a cash economy, newer technology, and of course, the individualism that goes with it all have greatly changed our perception of marine resources, especially on the main islands with airports and harbors. Unfortunately with greater western influence, western styles of marine resource management emerged, and all too often don't consider the wealth of traditional knowledge that exists throughout Micronesia. Instead, resource management throughout much of the populated centers of Micronesia is rooted with



(Above) *Lino Olopai, Cecilio Raiukiulipiy, and Andrew Rapo. JMF photo.*

“scientific-based decision” or “political will.” While science is certainly important, and beneficial, we’ve seen many examples where scientists appear to study some aspect of our islands for a short period of time, and then a report with recommendations that do not necessarily agree with what we’ve practiced for thousands of years emerges. In this sense, we are against the unilateral digestion of scientific trends for setting resource management policies. After all, isn’t traditional knowledge regarding the migrations and reproductive timing of marine resources science? And our “datasets” encompass thousands of years and not weeks!

While we strongly believe in Micronesia’s traditional knowledge, we are realistic in terms of understanding the changing world in which we live. For example, tasking somebody with the harvesting and husking 100 coconuts when they “illegally” fish in “closed” waters may be effective on Satawal, but not on Saipan. Conversely, confiscating all of the fishing equipment from an “illegal” fisherman on Satawal would be harmful for the

society that depends upon fishermen to provide protein to the community. But, we strongly believe there needs to be a stronger bridge between traditional resource management and western policies and laws that continue to grow. This bridge should be rooted in the underlying concept that people care more about people than money or politics. It follows that resource management decisions need to be discussed among the people, especially those who have a wealth of traditional knowledge.

Unilateral decisions by agencies, heavily influenced by politics or limited scientific insight, will only harm the sustainability of our marine resources. This is the unfortunate situation for most, if not all, of the main islands of Micronesia today. Greed finds the loopholes in legislation, and illegal activities find magical ways to avoid penalties. Society has to be involved for positive change. In Micronesia, society inherently includes traditional resource management knowledge. Laws and scientific study will always be needed in today’s world, we just need to re-focus them.

Letters to the Journal



(Above) Sun setting over Satawan Atoll, Chuk State, FSM. JMF photo.

CONNECTING PEOPLE

I just read and listened to Kesta's interview (from Namu Atoll, Marshall Islands, JMF Issue 2). It makes me proud and I am more motivated to assist him in his marine resource management endeavors. His atoll has been selected as one of CMAC's project sites for the upcoming year.

In addition, a HF radio will be provided as a means of alleviating the communications constraints that the atoll has had to deal with in regards to reporting illegal fishing and also project reporting.

I am also planning a second round of summer coral monitoring courses for the outer island participants and this will involve Scuba diving.

The initial equipment that we provided to the outer islands through these trainings (especially the underwater camera) are all being put to great use.

I am receiving photos of coral bleaching, COTs, algae blooms and other notable events to improve our understanding of the outer

island coral reef ecosystems.

Komol tata!
Jeff Zebedy, Marshall Islands Conservation Society

MORE PRESERVATION?

Greetings, I like what you are doing regarding the Micronesian Fishing magazine -- but I would start sending a stronger conservation message instead of Big and More is best... reminds me of the Great Barrier Reef in the 1950s where take all was a normal practice. Preservation for the future is necessary.

Robert van Woosik
Professor, Department of Biological Sciences, Florida Institute of Technology

GETTING GEAR IN MAJURO

My wife and I enjoy your magazine very much. Being from Portland, OR, we miss our "Sunset" Magazine.

I would like to know where to contact Mike Lizama "Speargun from Tinian," page 9 of JMF Issue 2. I would like to buy one to use here

in Majuro, MH.

Keep up the good work,
Jack Frost
Majuro, MH

A PROMISING PROJECT

What a magnificent journal, advocating local responsibility as the most promising path to sustainability! Congratulations on a job well done! It is beautifully produced. Excellent layout and well-worded.

Best regards,
Charles Birkeland
Hawaii Cooperative Fishery Research Unit, University of Hawaii at Manoa, Department of Zoology

GOT SOMETHING TO SHARE? WE WANT TO HEAR FROM YOU! DROP US A LINE:

Journal of Micronesian Fishing
c/o Pacific Marine Resources
Institute
PMB 1156 PO Box 10003
Saipan, MP 96950
Or email: jmf@pacmares.com

From Catch to Kitchen

SPICY CUMIN TUNA WITH GREEN SALAD AND CURRY SAUCE

Contributed by Sam Sablan

PREPARE THE TUNA

- 1 6 oz. Yellow Fin Tuna Loin
- 2 tspns. Ground Cumin
- ½ tspn. Korean Ground Pepper
- ½ tspn. Turmeric Powder
- 2 tspns. Salt
- 2 tbspsn. Olive Oil

Mix dry ingredients together and season the tuna loin. Heat the olive oil in a pan and brown each side of the tuna for 1 minute each side. Let the tuna rest on a plate and chill.

PREPARE A SIMPLE VINAIGRETTE

- ½ shallots or 1/8 red onions, chopped
- 2 oz. White wine
- 2 oz. Champagne
- ½ oz. Rice Vinegar
- 1 tspn. sugar
- 1 oz. Canola Oil
- Pinch salt/pepper

Combine shallots, white wine, champagne, Rice Vinegar, sugar, salt, and pepper in blender and slowly pour in canola oil.

PREPARE THE CURRY SAUCE

- ½ cup Coconut Milk
- ¼ teaspoon Lemon juice
- 2 tablespoons Curry Powder
- Salt/Pepper to taste



Combine ingredients in a bowl and mix well; chill.

PREPARE THE SALAD

- ¼ Green Leaf Lettuce, cleaned, chopped, and spinned;
- 3 oz. Spinach
- 1 Red Radish, thinly sliced
- ½ bunch Cilantro leaves
- 2 slices Lime, peeled
- 1 tspn. Dried Currants or Raisins and Golden Raisins
- 3 oz. Sliced Almonds

Entrée Set-up

Slice tuna into ¼" slices. Spread tuna slices on a plate. Combine lettuce, spinach, radish, cilantro, lime, and currants in a bowl. Mix in prepared dressing with greens. Mix well. Gently pile salads on top of tuna. Drizzle top of salad with curry sauce and sprinkle with sliced walnuts.

WORKING WITH *THE MICRONESIAN FISHING JOURNAL*

ADVERTISEMENT & SPONSORSHIPS:

JMF is distributed as hardcopies throughout Micronesia on a quarterly basis and issues are archived at www.micronesianfishing.com.

Advertising space is available, help spread the good word. Please email inquiries to jmf@pacmares.com.

WRITE TO US:

Journal of Micronesia Fishing

c/o Pacific Marine Resources Institute
PMB 1156 PO Box 10003
Saipan, MP 96950

VISIT OUR WEBSITE:

www.micronesianfishing.com

A perspective on Fishing Palau over the years



By Clarence “Obak” Kitalong

(Above) Obak and the catch of the day in the waters nearby Airai State’s rock islands. JMF photo.

I’ve come to appreciate all of the fishing I’ve done over the past 50 years. I’ve caught big emperors, white snappers, and groupers on hand lines that have left cuts and marks on my hands providing permanent memories. I shot wahoo, jacks, red and white snapper, and groupers with spearguns. I even shot bump-head parrotfish and Napoleon wrasse when it was still legal to do so here in Palau. But, even spearing small rabbitfish, or ‘klesebuul’, is the sport that I love and am addicted to.

I first learned how to fish by tagging

along with the older boys; following my firm belief of education by “doing” rather than “instruction.” Actions do speak louder than words. While I can easily write and talk about fishing, you have to get out there to understand it. That is how you really learn, like me, as a small boy with a passion for fishing. It was common for the older boys to simply throw the younger boys into the deep waters to teach them how to swim, and I learned to swim – fast. In actuality, it was the entire community that taught me most of what I know about fishing, but every now and

then I figured a thing or two out.

While all of the different fishing techniques I’ve used give me a similar level of satisfaction, nothing compares to the art of the throw-spear. I learned this technique before entering the first grade, when I was about 5 years old. The fishing grounds for young fishermen were the inner reefs, during the low tide. This is where my passion began, with the rest of the kids who ranged in age from six-to-twenty years old. The older kids would position themselves furthest from shore, leaving



the shallow waters closest to land for us youngsters. It didn't matter then though, there were lots of fish to spear and we had luck on our side.

(Above left to right) A fishing boat offloads its daily catch at the Malakal Fish Market, circa 1960's. Fish Market of Malakal, Koror. Photos courtesy of the TTPI archives. (Below) A nice catch from Ngetkib, Airai State boys in 2010. JMF photo.

Hitting a moving fish requires mental calculations that are fine-tuned by practice. Through dedicated, daily fishing your body and mind strengthen as you learn the patterns and behavior of the fish under different conditions. The learning curve can be frustrating at times, like when you hit coral and have to bring your spear in for repairs, shortening your fishing activity and giving you night time repair "homework." Through it all, one thing is absolutely certain, the art of throw-spear fishing is in your mind constantly, you dream about it at night. Eventually, your mental calculations of when and where to throw your spear synchronize, and the fish become easier targets to hit. Once you become so sharp and accurate in your aim that



OBAK FISHING
CONTINUED ON PAGE 8



(Above) Prized fish like the Napoleon wrasse are highly desirable food items, demanding top dollar in restaurants. Here, the wrasse is seen marking the entrance to the Palasia Hotel Restaurant in Koror, Palau. JMF Photo.

you keep hitting your target consistently, the people start to truly believe you are married to 'Esiu' or the goddess of fish!

Naturally, you would start to throw your spear at bigger game fish using a bamboo raft, canoe, and in later years, motor boats. Gamefish for throw-spear fishermen are mostly bumphead parrotfish and Napoleon wrasse that come in to feed on the productive shallow reef and later migrate to deeper waters. At this stage of expertise, many begin to use larger and heavier spears to hunt turtles and occasionally big trevally (jacks) and giant groupers.

FROM PAST TO PRESENT

Unfortunately, these days, most of the larger game fish are becoming less-and-less in numbers, and rarer to see. As a result, traditional fishing styles, such as my beloved throw-

spear are disappearing, being replaced with more efficient techniques. Even I had to adapt over the years.

rounded with traditional knowledge that would limit our catch rates. Now, people can search beyond the shallow

“Things like marine protected areas are now becoming more common in Palau, but their traditional counterparts, the ‘buls’, declared no fishing zones by village chiefs, are much more respected and successful.”

Over the past decade or so, I have been fishing mainly with spearguns, both day and night. I can tell you from first-hand experience how influential the underwater flashlight, or “torch”, has been to our fish stocks. This has been the most powerful tool introduced to local fishermen in Palau, providing access to the sleeping grounds of many fish. With this technology, harvesting fish is less dependent upon moon phases and tides, representing natural cycles sur-

habitats at night to find where the fish are resting. For the fishermen that have been taught traditional knowledge regarding fish migrations and spawning, the assistance of the flashlight can make them rich if they wish to combine the two resources for financial gain.

In my early years I could fill a cooler of fish in a few hours time. Since I started fishing I estimate that my catch rate has decreased at least

10 fold. The common fish I see big declines in are 'um', the unicornfish, 'erangel', the orange-spine surgeon fish, and 'meas' the rabbitfish. I have also noticed big reductions of 'kemedukl', the bumphead parrotfish, and 'maml', the Napoleon wrasse. Today there are laws to protect both these species, and in some places I am seeing more, but not like before when there were hundreds in many places.

Things like marine protected areas are now becoming more common in Palau, but their traditional counterparts, the 'buls', declared no fishing zones by village chiefs, are much more respected and successful. Even if a little child said they saw someone violate the 'bul' that person was punished. Now it's more difficult as people have less respect for modern

laws and regulations.

The key to traditional management success is a mutual respect for the chief's decision. When I reflect, the decline in fish abundances can be summarized through my three-prong spear. I used to use my three-prong spear for night fishing in shallow waters, but now I use it more for getting lemons from the tree.

Today, I prefer fishing techniques that offer me a mental challenge and a tasty reward. I'm not focused upon size and quantity, and actually never sold my catch for direct, continuous income.

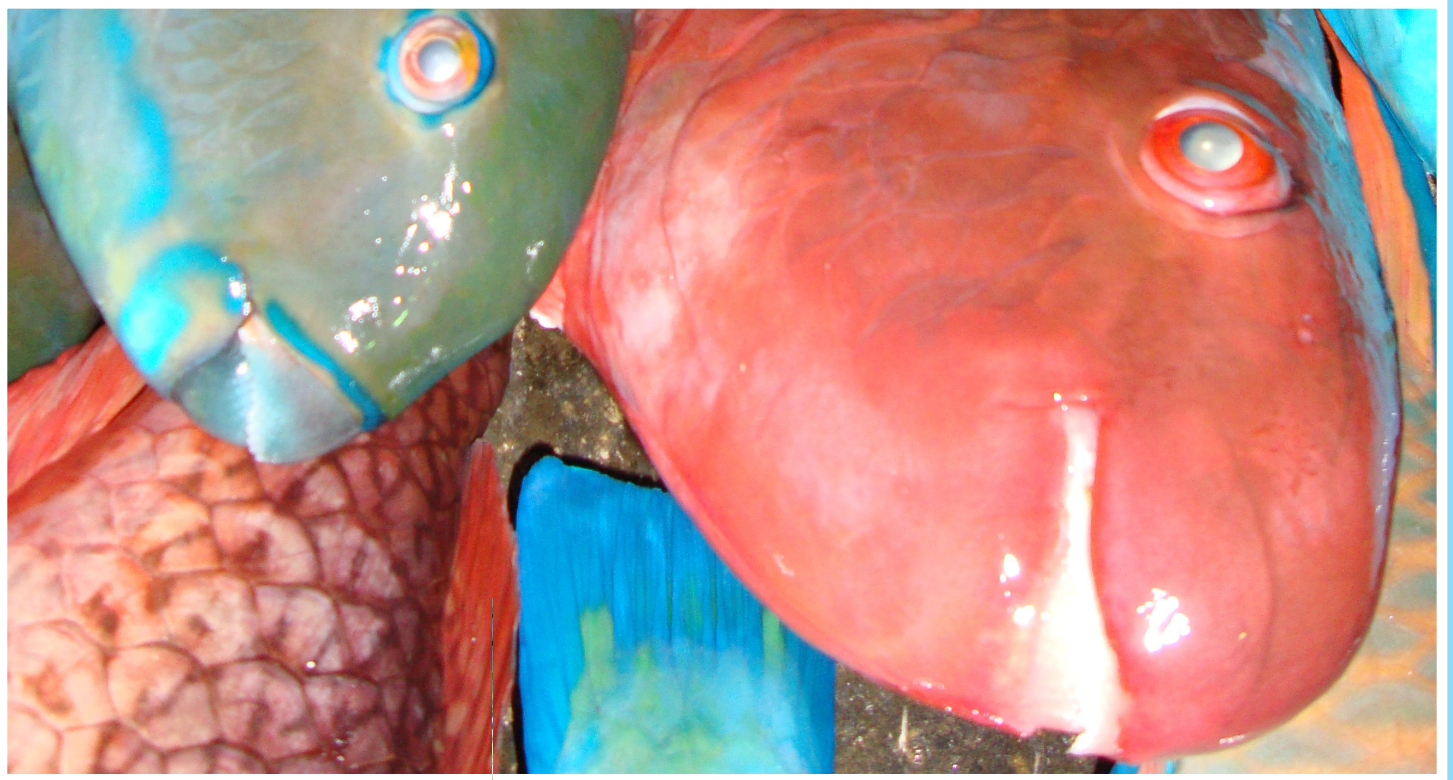
Besides keeping my daytime spear-gun fishing skills sharp, I have begun to take up cast net fishing. Airai is

well known for 'meas', a tasty rabbitfish that migrates to spawn in the spring but can be seen year round. Before, many men would line up with their cast nets to catch their share. The fishermen have said the 'meas' were so full of eggs and sperms that just by netting them and getting them into our canoe the water would be milky white from their ripe gonads.

Now we have seasonal regulation on when we can catch the 'meas', and you have to be a patient and accurate cast-net thrower to get your share.

In a sense, I reflect back to my throw-spear fishing days, and the similar mental challenges, and I realize why I am becoming to enjoy my cast net so much.





Market-based Fish Surveys

A Wealth of Information for
Micronesia, But Are We
Applying the Knowledge?



BY PETER HOUK

Any scientist will tell you that the most important aspect of designing a successful study is replication, replication, and replication. The more times you test a theory and gain support from the data, the more (statistical) confidence you have, and the more people you can convince that you are right. Some ecologists measure thousands of trees in forests, count hundreds of coral colonies on a reef, or follow flocks of birds relentlessly through a forest. However, when it comes to measuring reef fish one big problem often arises, we just can't stay underwater long enough to count the fish we need to.

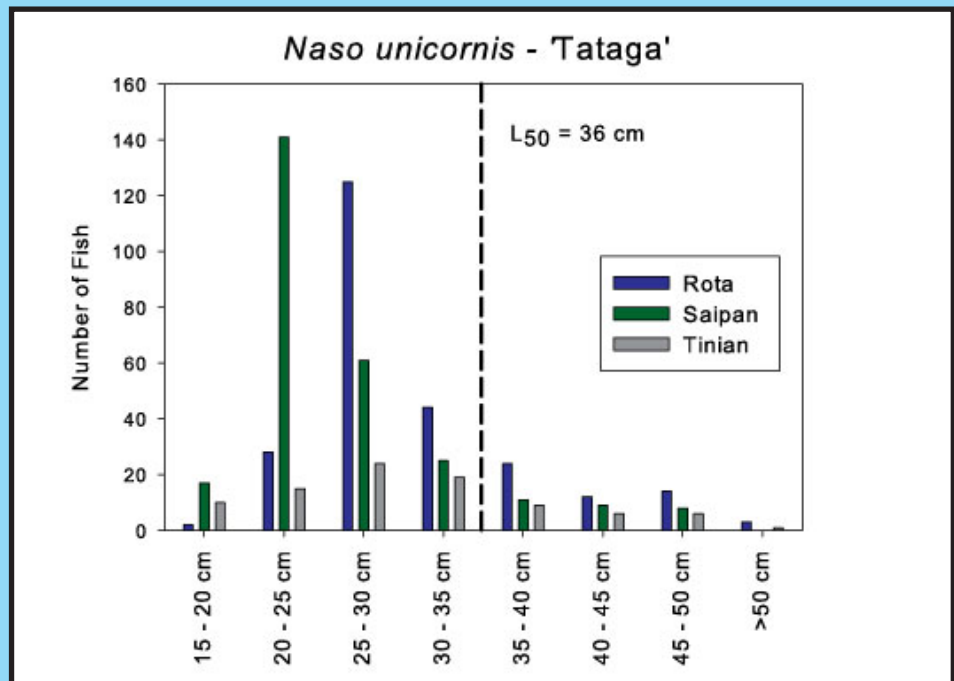
No matter how slowly you breathe the air in your SCUBA tank, it will eventually expire. The roving nature of most coral reef fish species requires a lot of replication to generate ideal statistical estimates, but most can't afford the time. This has been the root of much debate surrounding fisheries worldwide.

One solution often used to improve our understanding of fish populations is to compliment information taken from dive surveys (i.e., estimates of what exists out on the reef) with catches sold in the markets (i.e., estimates of what the fishermen are taking).

WHAT CAN WE LEARN FROM THE DATA?

1) What is the composition of the catch?

Not all fish are the same. Some eat plankton, others algae, coral, invertebrates, and even smaller fish. The larger, predatory fish usually take longer to grow and typically reproduce later in life. However, algae- and plankton-eating fish are an important base for numerous food webs in the marine environment. Through market-based surveys island nations can



Photos opposite page: (Clockwise from top) Parrotfishes for sale; salesperson at the market; fish on measuring board. This page: Unicornfish on measuring board. Photos courtesy of Jose Quan. Data for graph provided by market surveys from Rota, Saipan and Tinian.

examine 'how far down the food chain' their stocks are, and use numerous studies for comparison. Equally important, they can estimate how many of the important predatory fish exist in the fishery. A healthy functioning reef needs all types of fish to thrive. Fishing too far down the food chain can disrupt the balance of energy flow on coral reefs, and increase the likelihood for the establishment of reef and fish assemblages that are less

able to absorb the impacts of natural disturbances. The end result can be a compromised ecological system, and less food security for the societies which rely upon health reefs for the protein in their diets

2) Are fish able to reproduce before being caught?

This is a basic question that is readily answered by identifying and measur-

ing lots of fish. In a previous issue, the L50 was introduced (the size when fish typically start reproducing). Simple comparisons can be made between the most desirable fish species and their size at first reproduction. These results can help us understand how, when and where fish are being caught, and whether too many small fish are in the catch. This information can help guide size restrictions that reduce the capture of small fish and harmonize the stock and catch rates.

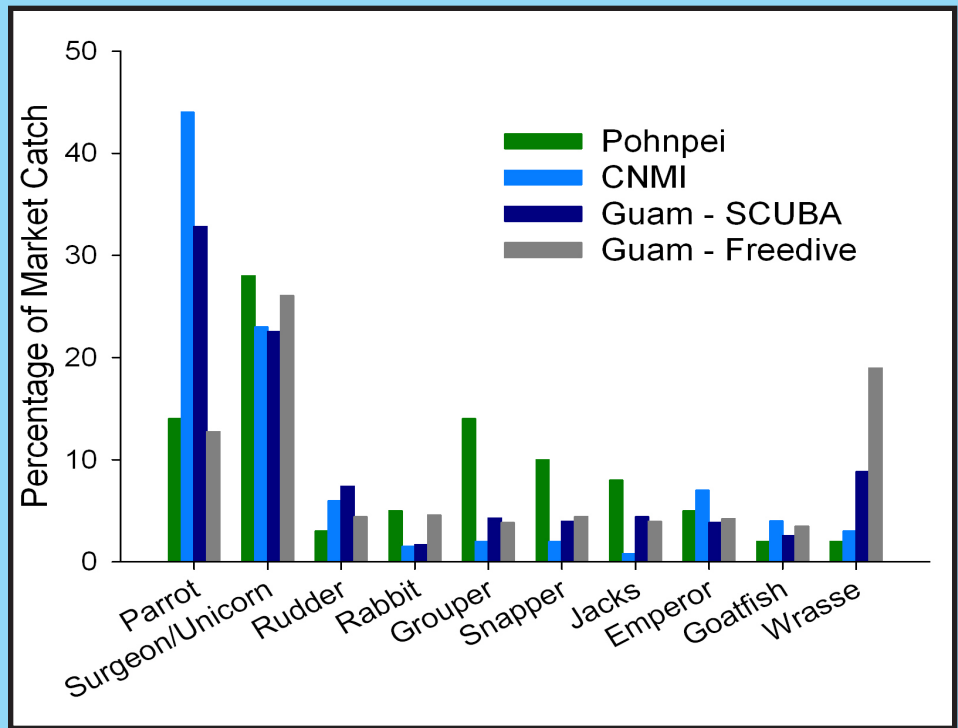
3) What are trends in catch rates?

Market-based surveys estimate the total biomass (weight volume) of fish being harvested, and on a yearly basis, can generate trends. Trend analysis typically relies on multi-year data to be considered reliable and few, if any, islands throughout Micronesia have enough consistent, annual market data to establish these trends yet.

CURRENT EFFORTS

Throughout Micronesia intensive market surveys have been conducted for numerous jurisdictions. Data, reports or current efforts exist from Pohnpei, Yap, Palau, CNMI, and Guam.

While islands are all different, the removal of carnivorous fish is one common result of increased fishing pressure. While common throughout Micronesia, the decrease in carnivorous fish seems most prevalent in the Mariana Islands based upon the currently available data. Pohnpei and Palau have a ban on the sale of groupers (one of the most dominant carnivorous fish on coral reefs) for two months during the peak spawning season. While these management practices benefit trophic stability (a healthy ratio of carnivorous and herbivorous fish both) the data show that total fish catch rates do not decline during these 'protected' months. Rather fishermen make up the difference in



(Above) Fish on measuring board. Photo courtesy of Jose Quan. Data for graph provided by market surveys from Pohnpei and Saipan, and fishermen interviews conducted by Guam Department of Aquatic and Wildlife Resources.

weight by catching more algae-eating fish, particularly unicornfish and parrotfish. This is a reflection of fishermen needing to maintain income (and catch volume) regardless of the fish targeted.

The popularity of unicornfish and parrotfish among consumers has also fueled these trends. In Saipan and increasingly in Pohnpei, data show the majority of unicornfish, and several

other species, are being caught at small sizes before they can reproduce. Targeting under-sized fish inhibits populations from maintaining themselves or recovering from overfishing. Clearly, without adults, populations can only decline when fishing continues.

In other cases, market surveys found extremely low numbers of key species, such as the bumphead parrotfish

and the Napoleon (humphead) wrasse that may require special attention. In Pohnpei, estimates suggest big parrotfish are already beyond “economic extinction”, meaning it takes more fuel and effort to catch the fish than fishers can get in return for fishing them. Napoleon wrasses are rapidly moving in the same direction.

Based upon these findings recommended management actions have included establishing minimum catch sizes, protecting key species during their major spawning events, stopping the harvest of species with extremely low populations, and regulating the gear used. All of these techniques are similar to the traditional methods used prior to European colonization.

While monitoring every fisherman would be impossible, the markets and restaurants typically make up a large proportion of the catch that is sold for financial profit. So, a simple start is to: 1) discuss the benefits and problems with potential policy actions among all stakeholders, 2) agree upon targets and goals for management

activities, and 3) begin by instituting policies that can be enforced through sales.

In support, several market owners I have worked with while collecting data understand the need to have a continuous supply of fish for their profit; however they have little choice but to purchase whatever fish the fishermen choose to catch and sell. One owner explained to me, “if we don’t consistently buy their catch they will find another market to sell to, and we may lose their future business, and ours.”

RECONCILIATION

While market-based surveys can’t answer all of the complex questions that fishery agencies and managers face, they provide a great starting point. Some key challenges are to maintain and improve data collection, availability, and translation. Yet, lots of data already exists, and little action has been taken.

- Perhaps part of the problem lies

in translating the information to the stakeholders, who ultimately, provide support for and can demand management action.

- Perhaps part of the problem is designing management strategies around the knowledge that exists.

- Perhaps part of the problem lies in convincing the small proportion of people that catch the greatest percentage of the fish, using the best technology, that our stocks are not unlimited.

- Perhaps part of the problem is convincing our lawmakers to pass relevant legislation.

Clearly, part of the solution resides in having a sound set of information upon which management can be judged, and market-based surveys are an important means towards this goal.

However, few localities have yet to act decisively upon the available information.



(Above) Jess from Asin’s Fish Market. Photo courtesy of Jose Quan.

Fishermen Talking Story

Gasma Nedlic

*Fisherman from
Lelu, Kosrae*

How many years have you been fishing?

I started fishing when I was a kid around 7 – 8 years of age. Then, I spent 15 years in the United States, that's the time I stop fishing. But after I came back to Yepanu, my home sweet home, I started fishing again, just the day after I arrived. I missed it so much. So I would say I have been fishing for nearly 25 years.

Who taught you to fish?

My dad was a fisherman. He taught me a lot about fishing. But really, most of my family members are fishermen, who also taught me.

What techniques do you most commonly use?

Trolling and bottom fishing are my specialties.

Is there a method of fishing that you used to use, but no longer do so?

I used to spearfish but I quit after I saw the JAWS movie. I could not stop thinking of it everytime I went underwater.

Do you typically fish during the day or night with these techniques?

Day time, under our hot sun.



(Above) Fisherman Gasma Nedlic. Courtesy Photo courtesy of Osamu Nedlic.

Do you use a boat when fishing or fish from shore?

On the shore I usually walk and sometimes I use a canoe.

What type of fish do you target?

All types of fish, but my favorite are the rabbitfish.

What year would you say was your biggest catch ever?

One time when trolling we caught over 100 pieces of tuna, that was back in 2001.

How many people were involved in catching that amount?

Just me and a friend.

Why do you fish?

Fishing is my beloved hobby. Other than that fishing is also the main source of my daily living.

What do you do with your fish?

I sell them when there is a good catch. I also always provide some for my family and relatives. I don't want them to spend money on fish. The worst thing about fishing is when you catch nothing.

How much do you make per pound? Has this amount changed over time?

Tuna has increased to one dollar a pound recently. This big increase is due to fuel prices. It used to be only 35- 50 cents a pound.

How important is income from fishing to you?

The income from fishing is in fact shouldering my daily living cost.

Does your fish catch vary with season, moon phase, rainfall, or other yearly weather patterns?

Moon phase mainly.

Since you started fishing, has your fish catch been consistent in terms of the amount of fish harvested? If no what change has occurred?

Back in 70's to 80's, it was easy to catch huge amounts of fish, and many different types of fish. For example, I could catch 50 – 70 pieces of emperor near the Lelu causeway back then. Currently the amount of catch in the reef flat areas is declining as well. The other thing I have noticed recently is the growing number of invasive species, or things we never saw common in the past.

Since you started fishing, has your fish catch been consistent in terms of the type of fish harvested? If no what change has occurred?

Comparing to the glory years in the past, rabbitfish and goatfish are hardly seen these days.

Do you fish alone or with partners? How many? Same partners over time?

Most of the time I go with my relatives and friends. I never go alone at night because I'm afraid of ghosts. I have a friend who always prefers to go fishing alone at night, Stain George, but I don't want to be like him.

Do you share your fishing knowledge with other fishermen? Family members? Community members? Government resource management agencies?

Family, friends, and now starting to



(Above) A young boy in Kosrae learning how to spearfish as the sun sets. Photo courtesy of Fran Castro.

“Back in 70's to 80's, it was easy to catch huge amount of fish... any types of fish. In the past days, I could catch 50 – 70 pieces of emperor near the Lelu causeway. .”

pass on to my kids.

Are there any areas you have stopped fishing? Why?

Yes, the reef flats areas near the causeway due to water quality and overfishing.

Are there any that you used to fish for that you no longer do?

Goatfish.

How far will you travel to catch fish?

Trolling, 7-8 miles off shore. Around the island though, I can go everywhere.

Overall on your island, what is the current status of fish population? (Rank 1 to 10, 10 being the highest).

I would say 7.

Has the type of fish being caught changed? How? Size changes of particular fish?

Yes, the size is getting smaller especially the rabbitfish.

In your opinion, are you aware of any management practice(s) that are helping to improve fish populations?

I have heard about the proposed MPAs. To me personally, I support this management strategy. We definitely have to consider the changes that have occurred in these days compared to the past. But surely, some people don't like the idea of no-take, protected areas.

In your opinion, what are the best management options to keep high fish populations year after year?

Set aside sites to be protected, size limits, and gear restrictions.

HEALTHY REEFS HEALTHY FISH



A MARIANAS ORIGINAL

THE YELLOW CROWNED BUTTERFLYFISH

This fish is found only in the MARIANAS- nowhere else in the world! It lives in and depends on the reefs for food and shelter. When we take good care of our reefs, we help protect the health of this rare species- A Marianas Original.



RARE
Inspiring conservation