

ORIGINAL : ENGLISH

SOUTH PACIFIC COMMISSION

JOINT FFA/SPC WORKSHOP ON THE MANAGEMENT OF
SOUTH PACIFIC INSHORE FISHERIES
(Noumea, New Caledonia, 26 June - 7 July 1995)

GUAM COUNTRY PAPER

by

Division of Aquatic &
Wildlife Resources
Agaña
Guam

GUAM COUNTRY REPORT

Status of Fisheries 1995

Introduction

Guam is the Southernmost island of the Marianas Archipelago. It is located in the Western Pacific at 13°29' N. latitude and 144°45' E. longitude. Guam is volcanic formation with a limestone cap on the Northern half of the island. It is approximately 214 sq. miles in size and has the general dimensions of 30 miles long by 8 miles wide. Guam is an Unincorporated Territory of the United States of America (U. S.) and has several significant U. S. military bases on the island (Navy and AirForce). Guam is surrounded by narrow fringing coral reefs and has a typical tropical climate. It is an ideal location to receive Pacific Ocean travelers as it is within 3 hours or less flying time to Japan, the Federated States of Micronesia, Republic of Belau, and the Philippine Islands. It is also a major flight path from Hawaii.

Nearshore fisheries resources have long been and remain a valuable component of island life on Guam. The oversight or management of nearshore fisheries resource is delegated to the Department of Agriculture but in many ways this responsibility is shared by a number of other agencies. Respective Departments within the Government through their enabling legislation have been granted authorities that protect the marine environment. Their role is equally important in long term health of the fisheries resources. The agencies and their respective role in fisheries management are:

The Department of Agriculture is responsible for the management of resources in general and therefore has a broad authority in the regard.

The Department of Commerce handles monitoring of commercial fisheries.

The Environmental Protection Agency is responsible for managing the potential impacts to resources most closely related to development.

The Department of Parks and Recreation manages the island's park systems and the recreational activities.

Since Guam is a U. S. Territory there are also federal mandates which are monitored locally for compliance through the Bureau of Planning, which oversees the Coastal Zone Management Plan.

Finally, there are two use plans which review proposed projects and identify permitting needs for coastal and terrestrial areas. These programs are administered by the Department of Land Management.

Each of these parameters will be expanded to better describe their function, successes, failures and future if known.

The Department of Agriculture, Division of Aquatic and Wildlife Resources (DAWR) is involved with all aspects of water and terrestrial resources. Within this Division, the Fisheries Section and Technical Assistance units deal with fisheries assessment, management, and environmental impact. Additionally, there is a separate Law Enforcement Section within the Division.

The Fisheries Section is funded by Dingle-Johnson and Wallop-Breaux grants which collect taxes on fishing equipment and motor boat fuels in U. S. jurisdictions. These funds are then distributed among the states and territories by a formula. These funds are limited to research, monitoring, enhancement, and education on recreational finfish.

The DAWR Fisheries Section is 100% federally funded and these funds do not allow any work on commercial fisheries, legal matters or species other than finfish. This remains a major problem in the current program since there are many important non-fish species that can not be managed and without a strong legal instrument to manage resources the data collection is futile.

DAWR has long recognized the need for fisheries data to manage the resources and has had an inshore fisheries monitoring program since the early 1960's. Catch interviews and participation surveys have established one of the better near-shore fisheries historical databases in the Pacific. The primary objective of this program are : 1) To establish annual time-series catch quantity, composition and effort values, 2) To identify trends in species composition and fishing effort which can be used to direct specific research or implement management needs.

Because it is not practical to have staff out collecting nearshore survey data on a daily basis, the survey technique employed is an expansion approach where random surveys are used to determine average values for the various methods and areas. These values are then expanded to generate annual estimates. This approach provides acceptable trend information and will identify potential problem areas. It will however need to be supplemented with specific studies on species or resources to determine their status. The nearshore survey integrates overall fishing participation with catch interview data to calculate the estimated annual harvest of finfish and invertebrates on Guam. The island is divided into three areas that is randomly surveyed four times a month (catch and participation) by motor vehicle. The remaining inaccessible areas are aerial surveyed twice a month (participation only) to supplement the other three areas.

Fishing participation surveys include the numbers of fishermen, gear units, location, and methods to estimate the level of fishing activity within the three accessible areas. Catch interviews provide participation data, fishing time, location, type of bait used, species composition, and total weight of reef fish harvested for each method. We can identify trends in the catch per unit of effort (CPUE) of various fishing methods, fish families and species, and island-wide participation based on this data.

In addition, seasonal catch data is an important aspect of the nearshore survey. Bigeye Scads, juvenile rabbitfish, and juvenile fusiliers exhibit highly sporadic recruitment and do not appear to be as vulnerable to over fishing as other reef fish species. On the other hand, juvenile jacks and juvenile goatfish have suffered drastic reductions and this is expected to be largely because of the heavy fishing pressure on the species both as new recruits and as adults.

Short-case Study

Scientific research is an important component of an effective fisheries management program. Due to the design of the inshore survey, we can identify potential collapses within the fishery and hopefully gain some insight towards a long-term management plan.

One such project identified an alarming decline in the annual catch of the yellow stripe goatfish, *Mulloides flavolineatus*. A biological survey (DAWR project number FW-2R-28) was conducted during fiscal year 1985 in order to assess the need for intensive management of this species of reef fish. Results indicated that the population structure was skewed toward juvenile size classes, therefore reducing their reproductive potential and population structure. Management suggestions included the development of marine preserves and legislation to increase minimum gill net mesh sizes.

The Fisheries Section helps provide information which the Government can use to strengthen statutory and regulatory authorities, conduct resource specific research and enhance coastal fishing areas by providing boat ramps, piers, fishing platforms etc.

One of the major difficulties experienced on Guam with monitoring reef fisheries has been the constant evolution of changing fishing methods. Over the last 15 years there have been major swings in participation greatly due to the introduction of new gear and declining resources. This makes it very difficult to compare years because the methods are not the same. The CPUE is often meaningless because the method is so much more effective that it is not a reflection of the stock. If compared, it can give the false impression that there are more fish than during previous years.

One discovery that has recently emerged from the data is something that can easily be overlooked with nearshore fisheries if only stock information is being analyzed. In most countries there are a number of locations which are only accessible by boat. This has provided some relief from human impact but two things have changed this aspect of things on Guam. The economic surge has afforded more people boats, so more fishermen are venturing to remote areas. Development also created shoreline access to many areas that could not be easily entered previously. This has further complicated the declining resource issue because many of the naturally protected areas are now being heavily exploited.

A final component of the fishery which again is recent and has had a major impact on Guam is commercial reef fishing. The demand for fish on Guam has grown tremendously. This has resulted in small groups of fishermen, predominately night spear fishermen harvesting and selling reef fish on nearly a full time basis. The more they could catch the more money they can make. They became less selective and will take just about anything they think they can sell. They also cover large areas on a repeated basis. This type of fishing has nearly decimated certain fish species in shallow reef areas (example, some of the parrotfish). Now as a result of difficulties in catching fish, many have switched to night SCUBA spear fishing. This has added the additional problem of taking large terminal phase fish which has a great impact of reproductive contribution within a population.

Guam's coastal resources have been showing strong signs of potential collapse. There are many factors contributing to this situation and steps are being taken to recover some of these losses. Biological surveys and data collections are an essential element in the management process and enable us to gain a better understanding of our finfish and invertebrate resources. Present data collections show the problem and now this data needs to be applied to manage the resource. A reasonably extensive proposal has been developed and is going through the required steps to be submitted to the legislature. The proposal addresses requirements for commercial nearshore fisheries, licensing, import and export of fisheries products, establishment of five marine preserves and refining of many existing regulations.

Throughout the Pacific and other ocean areas it has been fairly well accepted that marine preserves are the most practical means to protect the whole of fisheries resources on coral reefs. One issue which continues to haunt this approach is the larval recruitment aspect that these preserves rely on. It has to be presumed that the resulting increased egg production from protected fish will have some direct benefit to the island. This has really not something that has been proven yet. To the devil's advocate, this is the major weakness in this strategy even though recovery of resources through preserves has been documented in some areas, their recruitment process could be different.

The laws and regulation protecting resources are only as good as the public's understanding and support of these measures. This has placed a strong need on an aquatic education program. The present aquatic education program focuses on school visits but the demand has exceeded the staff and therefore the program is moving toward training for teachers. The teacher will gain continuing education credits, be provided with training material and be able to integrate aquatic education throughout the school year. Hopefully this will also allow this program to expand to new audiences.

The existing program has proven very valuable to law enforcement and the public has informed our officers on many occasions of people committing illegal acts.

DAWR Law Enforcement

DAWR also has its own law enforcement unit of sixteen officers, which deal exclusively with the enforcement of aquatic and wildlife statutory and regulatory authorities. They are full fledged police officers and carry weapons while on duty.

There are currently no license fees, size restrictions, or bag limits for the harvest of reef fishes on Guam. Regulations have been established on size restrictions of invertebrates subject to intense fishing pressure. Laws have also been passed to eliminate abusive fishing practices, which include use of dynamite and/or any chemical to indiscriminately kill marine life and specific restrictions in the use of gill nets and weirs.

Some of the more typical offenses include the abandonment of gill nets, taking of live coral, harvest of under-sized lobsters (usually gill netted or speared) and trochus shells, and the use of the local "derris" plant poison or bleach to damage the reef and kill fish.

From a lessons learned perspective there are few pointers that should be shared.

1. After a number of failed prosecutions, it pays to be diligent in defining key words used in laws clearly and decisively. We have lost a couple key cases on interpretation of a single word.
2. We have a number of laws which are reasonably old that do not have any real foundation for the size limit or quantity limit established. Additionally, the particulars are very difficult for a law enforcement officer to establish in the field on sight. An example of this would be setting a weight limitation for harvesting lobster. Lobster can be speared on Guam and basically what this forces the fisherman to do is shoot and kill the lobster first and then determine if it is heavy enough. If it is not, they discard the now dead lobster. This is just not smart! This could be solved by having length measure which could be marked on the spear and used before shooting the animal. This could be further improved if the lobster could not be speared and caught by hand or some other device that does not damage the animal until determined to be legal for harvest. Another example is using weight the number of shells one can harvest.
3. One of Guam's greatest problem presently is the legal use of small mesh gill nets or throw away nets as they are often referred to on Guam. It is detrimental enough that the use of small mesh gill nets, sometimes as small as 1/2 inch are legal, but because these nets are not very costly and get easily damaged; fishermen get lazy and leave them out on the reef once they have caught enough. The nets continue to catch fish, and then the captured fish are attacked and capture other fish which get caught. This cycle can continue for a long time. There needs to be a strong message sent about this non-selective fishing method, but several attempts thus far have failed.
4. One of the best deterrents Guam law has is the ability to confiscate all paraphernalia, vehicles, vessels and weapons associated with the crime. Once an aquatic or wildlife crime has been committed, if it can be proven the item was involved in any way with the crime it becomes the property of the Department. This has been a great deterrent and helped the Department. This is even more important to Guam since most of the fines are petty misdemeanors and have a maximum fine of \$500.
5. Our policy at DAWR for callers reporting illegal incidents, is that they can remain anonymous if they choose. This helps more people to feel comfortable

in calling because it protects them from getting more involved if they do not want to. This is particularly important in small countries where everyone knows each other or come from big families.

6. Finally, it is well known that if the public does not support the management of resources, enforcement will be difficult if not impossible. Be sure to get public input to develop laws. Public education is a strong tool.

DAWR Technical Assistance

Along with fisheries specific resource assessments comes the need to monitor human activities both on land and in the seas. It is easy to see that activities on land effect our oceans. The Technical Assistance Program along with staff from the Fisheries and Wildlife Sections review proposals for various types of development. These reviews are part of the permitting requirements established within other agencies. The rapid economic growth that Guam experienced in the mid to late 80's was hard on the environment. Poor land management practices increased soil erosion, storm runoff, increased solid and hazardous waste. These parameters are also expected to be major contributor to the decline of coastal fisheries resources. DAWR is also the lead agency for reviewing impact to wetlands, which again are critical to the health of coastal areas.

Department of Commerce

The lead agency in commercial fisheries. Guam's nearshore commercial fisheries are small scale from a business perspective but still represent a major impact from a resource perspective. Presently this Department's program focuses on commercial vessel transshipments since there is no legal large scale commercial fishing within Guam's waters. This Department monitors large scale commercial fish imports which is almost entirely tuna transshipments caught outside Guam's jurisdiction for marketing in Japan.

Guam Environmental Protection Agency

Water, Air, Land and Sea are all the responsibility of this agency. All monitoring, initial review and approval of proposals, approval of environmental impact assessments fall within this Agencies mandate. When Guam entered the rapid growth period, it was unrealistic for this agency to maintain control of the monitoring and enforcement of development projects. They were understaffed and developers could work faster than they could be monitored. This resulted in significant problems with erosion and sedimentation as well as runoff. In response to this problem changes have been made in the review process and in the standards regulating activities. The slowing of the development has also afforded more time for review.

Department of Parks and Recreation

The management of Parks and Recreation has become an ever increasing job and of great importance to coastal management. In addition to the normal management of coastal park areas which provide public access and fisheries opportunities, the strong emphasis in the tourism industry has brought many new water related activities. Tourism is the number one industry and generated over a million visitors in 1994. Guam experienced a tremendous economic development boom that started in 1984 and continued for several years. This boom brought rapid structural development and raised the per capita income significantly. This economic boost had a significant impact on coastal areas as more residents could afford to invest in recreational vessels or water gear. Additionally, rapidly growing tourism industry became a driving force in introducing new water recreations to the island. Since the main attractant for tourist to Guam is the tropical weather and beautiful surrounding coral reefs, this all seems natural.

In 1986, a small group of water-jet propelled single operator craft (often referred to as a jet-ski) began operating on a shallow reef flat near Guam's main business district. From the onset quite a few fishermen expressed frustration while trying to fish in the vicinity of these craft. They claimed the operators had no respect for their activity and they also were scaring the fish. In a short time many other users, swimmers, snorkelers, board sailors, other boaters, also began to express frustration. This was not the first new recreation which impacted other more traditional uses of our oceans but was the first that was so incompatible. The particular bay which most of the encounters were occurring is a traditional harvest area for seasonal recruiting juvenile rabbitfish. In 1988, 29 metric tons of this fish were harvest island-wide and 50% of the harvest was derived from this bay. Due also to the fact that these fish are highly prized culturally, tension became very high between the fisherman and the jet-ski operations. Initially when the government fisheries agency raised concern the comment was there is no hard proof. It took a year to gather sufficient information but by this time the commercial operations had expanded extensively. Finally the Government established a group to develop a reef user plan, the Recreational-Water-Use-Master-PLAN (RWUMP). It was obvious that there were many more usership issues which also need to be addressed at the same time.

The RWUMP committee consisted of a variety of Government Agencies seen to be important to development of such a plan: The Bureau of Planning (Chair), Guam Environmental Protection Agency, Department of Parks and Recreation, Guam Police Department, University of Guam Marine Laboratory, Attorney General's Office, Division of Aquatic and Wildlife Resources, U. S. Coast Guard, and Guam Port Authority. As is most Governments there is a prescribed method to develop laws and regulation. In this case agencies with the appropriate delegated authority were used to promulgate regulations (Department of Parks and Recreation and the Guam Police Department). This was necessary because both the recreational and law enforcement aspects of the plan could be activated.

A plan was developed which includes a regulatory document with supplemental maps of coastal areas. The maps delineate user areas and the regulation provide the working framework. This plan has worked well in minimizing conflicts and increasing use.

Bureau of Planning

The Coastal Zone Management ensures that Federal Consistency is met. This requires that all permits and approvals for the Army Corps of Engineers (permits required for filling more than 10 cubic yards, driving piles in coastal or wetland areas, earth moving activities, construction of permanent structures), 401 water quality certification (meet federal water quality standards), Endangered Species Act (may require and environmental review more commonly known as a Section 7 consultation

Department of Land Management

Two distinctive commissions operate through the Department of Land Management: The Territorial Land Use Commission (TLUC) and the Territorial Seashore Protection Commission (TSPC). These are Governor appointed members of the community from selected backgrounds that must be confirmed by the Legislature. There are seven members and they serve on both Commissions. The TLUC reviews land based zone changes, conditional uses, hotel or large development projects. The process requires an application to be submitted and reviewed by a whole host of Government agencies. The Government Agencies meet through a forum call the Development Review Committee (DRC) and determine appropriate actions. Each agency submits a written position statement. Once an action has been agreed upon, the application is put on the TLUC agenda, the position statements are presented and the applicant appears before the Commission. The Commission will determine whether to approve, disapprove,

conditionally approve or return the application to DRC. The TSPC uses the same process but the area covered is only from 10 meters above the mean high tide mark to the ocean contour of 10 fathoms or 60 ft. This area is protected under the Seashore Protection Act as public domain. Any development, removal of material, filling, dredging, proposed business operation must get a permit. The Seashore Protection Act has been quite effective in maintaining public access and minimizing structural development.

One of the shortcomings of this system was not having a master plan to follow. This would have helped to guide the public in pursuit of potential land or ocean activities. This would have reduced applications and removed some of the politics. More recently, Agencies have been given additional authorities in review and commenting on application by requiring agency approval for special documents under their direct authority. An example would be an environmental impact assessment, which must be approved by the Environmental Protection Agency prior to being heard by the rest of the Government. Another area where this approach could be improved would be to require the applicant to pay the Government to obtain a consultant to perform work so the consultant did not feel obligated to report information in the interest of the applicant. This process is not as simple as explained but if additional information was of interest, the laws and permit requirement can be provided upon request.

Although only one of six agencies discussed actually deals directly with nearshore fisheries, all six play a vital role in its health. Guam has suffered significant habitat losses from sedimentation caused by uncontrolled development, wildland fires, off road vehicle use and acts of nature. Without clean clear tropical seas the fisheries are all at risk. As with all management strategies they are only as good as they are enforced. Presently, this appears to be our biggest problem. Once conditions and standards are established, money and manpower will have allowed full enforcement.

Summary

Guam is a small island by comparison to many of the other countries and has a very limited marine resource. The once seemingly endless supply of fish has already been affected drastically. Presently there are four major areas that Guam has to address to effectively manage the fisheries.

1. Use of marine resources is a way of life and slowly but surely many privately owned areas have now made it impossible for the public to gain easy access to that sector of shoreline. The Government needs to work hard to keep easy public access to beaches and reefs.
2. There are many more users on the water now than before. All these groups should be able to co-exist along as they recognize each other and the limitation of their activity. The Government has established a user plan which is only partially completed. This plan needs to be completed in its entirety.
3. The Government needs to take stringent measures to deal with the stock depletion issue. The present proposal to overhaul the fishing regulation is a great first step but this will only deal with the regulatory control. The statutory measures are still in great need of revision.
4. The only way in which these first three issues will work is if the public understands the need for them. This will require a persistent education program. The present Aquatic Education Program needs to be expanded. The shift to teacher training and expanding other audiences must also be approached.