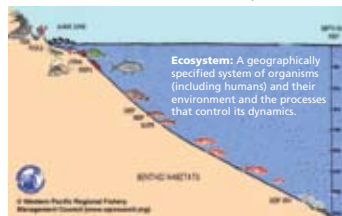




Progressing from a Species-based to an Ecosystem-based Approach to Managing Fisheries in the Mariana Archipelago

What is an ecosystem approach?

- > It is adaptive and geographically specific
- > It accounts for ecosystem knowledge and uncertainties
- > It considers multiple external influences
- > It strives to balance diverse social objectives



Ecosystem: A geographically specified system of organisms (including humans) and their environment and the processes that control its dynamics.

How is the change taking place?

- Management measures for the insular fisheries in US exclusive economic zone (EEZ) waters surrounding Guam and the Northern Mariana Islands have been taken from the Bottomfish, Crustaceans, Precious Coral and Coral Reef Ecosystem Fishery Management Plans for the Western Pacific Region and are now contained in a single document—the Mariana Archipelago Fishery Ecosystem Plan (FEP). The Western Pacific Regional Fishery Management Council approved the FEP in December 2005.
- A Mariana Archipelago Regional Ecosystem Advisory Committee (REAC) has been created and the Council's Advisory Panel and Standing Committees have been restructured to provide enhanced local knowledge and input into the management process.
- Managers are increasing their understanding of a range of social and scientific issues, which will be used through adaptive management to advance the implementation of ecosystem science to manage the fisheries in the Mariana Archipelago.



What are ecosystem issues?

- > Appropriate management objectives
- > Biological and trophic relationships
- > Effects indicators and models
- > Ecological effects of non-fishing activities on the marine environment
- > Cultural and social components of the environment
- > Involvement in management, especially by people who rely on the environment for their livelihood, social relations and cultural identity

Historical Overview of the Fisheries



Prehistoric Chamorro harvested sea turtles, shellfish and invertebrates and likely sharks and dolphins. Under Spanish colonization in the 1600s, destruction of large canoes and canoe houses led to the loss of pelagic fishing. By the mid-19th century only 24 outrigger canoes remained on Guam for fishing inside the reef only.

Under European colonization, the number of Chamorro in the Mariana Archipelago was drastically reduced from an estimated 40,000 persons in the late 17th century to about 1,500 persons a hundred years later. Inshore fishing for invertebrates and reef fish and reef gleaning were the main means for obtaining marine protein.



Carolinians (Rafaelwusch) settled on Saipan in the 1840s. They are known for their seafaring and fishing skills. Fishing centered on lagoon and reef species. They sometimes paddled small canoes to fish a short distance outside the reef.

After the US acquired Guam in 1898, it held training programs to encourage local residents to participate in offshore commercial fishing. However, the native people lacked the capital to purchase and maintain large enough boats, so inshore fishing continued to be a subsistence base for native people.



During the Japanese rule (1914-1944), the Chamorro and Carolinians continued to rely heavily on subsistence use of inshore species. After WWII, the US military assisted several Guam villages to develop an inshore commercial net and trap fishery. The first year a pelagic species was included in a catch report to the postwar Guam civilian government was 1956.

In the 1970s, a group of Vietnamese refugees on Guam fished commercially for reef fish, bottomfish, tuna and mackerel. The Guam Fishermen's Cooperative Association began operations. In CNMI, several boats

over 25 feet in length were actively engaged in commercial fishing by 1980, primarily for bottomfish and pelagic species.

Today, the Guam Fishermen's Cooperative's membership includes more than 180 full- and part-time fishermen. However, most of these and other fishermen in the Mariana Archipelago continue to harvest primarily for subsistence, barter and cultural sharing purposes, such as for fiestas and food exchanges with family and friends.

Non-fishing Impacts on Marine Fisheries and Resources

Human Impacts

- > coastal construction
- > soil erosion & sedimentation
- > industrial pollution
- > hazardous waste
- > nutrient loading (sewage/eutrophication)
- > tourism & recreation impacts
- > overuse
- > urbanization

- > vessel groundings, anchoring & oil spills
- > marine debris
- > aquatic invasive species
- > security training

Non-Human Impacts

- > weather cycles
- > hurricanes
- > flooding
- > environmental changes

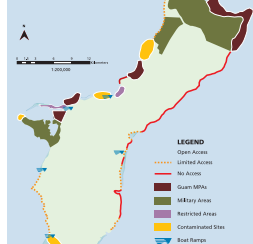
Photo courtesy of Guam Fishery and Soil Resource Division



Many near-shore reefs on Guam have been degraded by natural and human impacts, especially sedimentation, tourism and overharvesting. The reefs at Guam's offshore banks and coral reef fisheries in the CNMI appear to be generally in good condition.

Map (upper right): The Mariana Archipelago Regional Ecosystem Advisory Committee on Guam has made recommendations on a variety of non-fishing impacts, such as limited coastal access, marine protected areas, water quality, tourism, overdevelopment and military buildup.

Coastal Access on Guam



LEGEND
Open Access
Limited Access
No Access
Military Area
Restricted Area
Contaminated Site
Base Range



The natural and cultural environment of the Mariana Archipelago faces a major challenge with the relocation of about 8,000 military personnel and their families (40,000 total) to Guam from Okinawa along with 12,000 foreign construction workers. Increased military training will likely occur CNMI as part of the military realignment.

Mariana Archipelago Fisheries Today

Coral Reef Ecosystem Fishery

Recent information on noncommercial catches of coral reef resources is not available.



In CNMI, most fishing is in nearshore areas. Finfish and invertebrates are the primary targets. Small quantities of seaweed are taken. Commercial landings include parrotfish, surgeonfish and goatfish. Six of the Northern Islands have been fished commercially. Currently moratoriums exist for sea cucumber and topshell.

In Guam, primarily shore-based fishermen harvest more than 100 species of fish. Less than 20% of the coral reef resources harvested are taken in the EEZ. Most offshore banks are deep, remote, shark infested, subject to strong currents and accessible only from May to September.

Crustacean Fishery



Spiny lobster is hand harvested by subsistence and recreational divers in nearshore waters of the inhabited southern islands of CNMI and territorial waters of Guam. In the CNMI Northern Islands, bottomfish fishermen at Farallon de Medinilla occasionally night dive for lobster within 3 miles of shore, mainly for personal consumption. The reported annual commercial harvest is <500 lbs. in CNMI. Unreported commercial and non-commercial catch could double this figure. Four vessels hold federal lobster permits for the US EEZ of the Mariana Archipelago.

Deep-water shrimp are sporadically trapped throughout the Pacific. This fishery operates in CNMI near steep banks at depths of >350 meters, mostly around Saipan and Tinian, in the 1990s.

Bottomfish Fishery

Fishermen operating in waters <500 feet are the largest sector. They include small-scale commercial, recreational and subsistence fisherman targeting red-gilled emperor in CNMI and reef-dwelling snappers, groupers and jacks in Guam. Vessels are generally less than 25 feet in length with trips limited to one day and within a 20-mile radius. In CNMI, about 150 skiffs fish the islands and banks from Rota to Zealandia Bank north of Saipan. In Guam, less than 20% of the harvest is outside 3 miles and charter fishing is about 15% to 20% of all bottomfishing trips. An unknown portion of bottomfish landings are shallow-water snappers, emperors and groupers, which may be considered part of the coral reef ecosystem.



A smaller sector of primarily small-scale commercial fishermen operate in waters >500 feet for snappers and groupers. In CNMI, 8 to 43 vessels ranging 29 to 70 feet make midday trips to the Northern Islands, focusing effort from Esmeralda Bank to Zealandia. In Guam, three commercial bottomfish vessels are believed to be active.

Precious Coral Reef Fishery

Little is known about the presence of precious coral in the Mariana Archipelago waters. The available habitat is limited because of the steep topography. Reports of a pre-WWII fishery suggest large quantities of high quality *Corallium* spp. were taken north of Pagan Island, CNMI. Since then, no precious coral harvests have occurred within EEZ waters around the CNMI. There has been no reported landings from EEZ waters around Guam.



To become involved, contact the Council at (808) 522-8220 or at info.wpcouncil@noaa.gov in Guam, John Calvo (671) 649-3150 or 688-6400; and in the CNMI, Jack Ogunmoro at (670)-322-9830 or 287-9482.

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