

# **Fishing methods of the Mariana Islands, Micronesia**

Compiled and annotated by

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*Dângkolo na Saina Ma'åse!*



## **SUMMARY**

This report provides an up-to-date summary, taken primarily from the literature, of fishing methods used in the Mariana Islands, Western Micronesia from prehistoric times to the present. The provided tables give information on the native names of the methods, the primary target species of each method, estimated timeline of use, and the main habitats in which each method is employed in the Mariana Islands. Some techniques have not been exhaustively covered, such as those for harvesting invertebrates. Nevertheless, based on this list, 51 different fishing techniques appear to have been used or are still used in the Marianas. About 40 (78%) of these techniques appear to have been in use during prehistoric times. Of these indigenous methods, about half are still in use. Another ten methods or so (10%) have been introduced, usually after World War II.



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## INTRODUCTION

Guam is experiencing unprecedented rates of decline in many of its marine natural resources. Several once common and highly esteemed food fishes such as **atuhong** (*Bolbometapon muricatus*) and **tanggison** (*Cheilinus undulatus*) are now quite rare, ostensibly due to overfishing. Management and conservation measures relating to fishing, particularly when it could curtail traditional fishing practices, have understandably become of intense public and professional interest.

Hence, I thought it would be useful for resource managers and local artisans seeking to revive traditional practices to have a summary of the fishing methods, both traditional and introduced. Most of this information was extracted from what is by far the most authoritative recent assessment of fishing techniques from the Mariana Islands, the now out-of-print book *Fishing on Guam* by Amesbury, Cushing and Sakamoto (1986). The book is based on extensive first-hand experience, observations and interviews with local fishermen, and compiles historical data from pre-20th century European expeditionary reports.

The project subsequently expanded to include methods not included in that book, as well as information on the primary target species of each method, estimated timelines of use, and the main habitats in which each method is employed. This report lists 51 different fishing techniques. This is hardly a definitive number, as a few of the methods are merely interesting or important variants of others. Still other techniques have not been exhaustively covered, such as those for harvesting invertebrates. About 40 (78%) of the listed techniques appear to have been in use during prehistoric times. Of these indigenous methods, about 23 are still in use. That is, nearly half of the indigenous methods of fishing in the Mariana Islands appear to no longer be in use. Another ten methods or so have been introduced, often since World War II. These include trolling with modern hook and monofilament nylon line, fishing with mounted motorized reels for deepwater snappers and the use of spear guns and goggles. Detailed accounts of most methods, including methods endemic to the Marianas (e.g., **Poio**) can be found in Amesbury, Cushing and Sakamoto (1986).

The data are provided in two large tables of information. Table I is arranged first by methods. Taxa are listed by family name or, when possible, by genus. Fishing methods, target species and timeline of use, when not observed personally, are primarily from Amesbury, Cushing and Sakamoto (1986) and Smith (in Amesbury, Cushing and Sakamoto 1986), as well as their compilation of observations in de Freycinet (1829), de Zamora (1602 in Driver 1984), Fritz (1904) and Safford (1905); see also Kerr (1990). In Table II, the same data are arranged by the 67 most abundant families or subfamilies of fishes in the Mariana Islands (including large pelagics), then by their main habitats and the historically main techniques used to fish them. Family names are from Myers and Donaldson (2003).

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TABLE I. Fishing methods of the Mariana Islands. Taxa are listed by family name or, when possible, by genus. Fishing methods, target species and timeline of use, when not observed personally, are primarily from Amesbury et al. (1986) and Smith (in Amesbury et al. 1986), as well as these authors' compilation of observations by de Freycinet (1829), de Zamora (1602 in Driver 1984), Fritz (1904) and Safford (1905); see also Kerr (1990). A = from Amesbury et al. (1986); J = Dr. Judith Amesbury, pers. comm.; K = Kerr, this study.

Technique	Definition	English name	Latin name	Timeline	Habitat
<b>Atulai gill net</b>	Very large monofilament gill nets, to 12 m X 100 m are set in deep water with a boat to catch <i>atulai</i> . A, K	Big-eye scad	<i>Selar</i>	1950? to present	Channels, Reef slope
<b>Batangga</b>	During the day or night, trolling with 20-m line behind a canoe or small boat along the reef edge using a lure made from feathers and shredded bark of <i>pago</i> ( <i>Hibiscus tileaceous</i> ). A	Snappers, jacks, groupers, tuna, barracuda, squirrelfishes, eels	Lutjanidae, Carangidae, Serranidae, <i>Katsuwonis</i> , <i>Sphyraena</i> , Holocentridae, Muraenidae	Prehistoric? to present	Reef edge, Reef slope, Channels, Lagoons

<b>Technique</b>	<b>Definition</b>	<b>English name</b>	<b>Latin name</b>	<b>Timeline</b>	<b>Habitat</b>
<b>Bleach</b>	Laundry bleach is poured into a river upstream from areas with prawns. The killing effect seems to dissipate ca. 100 m downstream for even narrow, shallow streams. K	Freshwater prawn	<i>Macrobrachium lar</i>	1950? to present	Rivers
<b>Chenchulu</b>	A large net, to about 2 m high and over 60 m long, though the net could be much smaller. The net was set by piling it on two canoes or other floating platforms and sending the canoes in opposite directions to converge in a circle, while others splashed and chased the fish into the closing net. Fishers then enter the net and spear the fish. A, K	Various including emperors, snappers, surgeonfish, rabbitfish, mullet, goatfish, jacks, groupers, darts	Various including Lethrinidae, Lutjanidae, Acanthuridae, Siganidae, Mugilidae, Mullidae, Carangidae, Serranidae, Trachinotidae	Prehistoric to present	Reef flats, shallow lagoons

<b>Technique</b>	<b>Definition</b>	<b>English name</b>	<b>Latin name</b>	<b>Timeline</b>	<b>Habitat</b>
<b>Day spearfishing</b>	Spearfishing with goggles in the daytime over the reef is done with a "day gun", sometimes called a "Palauan gun," usually a hand-made speargun from 1.5 to 2 m long. Increasingly, factory-made spearguns are used. A, K	Various including emperors, snappers, surgeonfish, rabbitfish, mullet, goatfish, jacks, groupers	Various including Lethrinidae, Lutjanidae, Acanthuridae, Siganidae, Mugilidae, Mullidae, Carangidae, Serranidae	1950 to present	Reef slope, Lagoons, Channels, Offshore
<b>Deep bottom fishing</b>	From a boat, a line on a motorized reel drops baited hooks to deep reef slopes and offshore pinnacles from 150 to 300 m depth. A, K	snappers, groupers, jacks	Lutjanidae, Serranidae, Carangidae	1970s to present	Reef slope, Offshore

<b>Technique</b>	<b>Definition</b>	<b>English name</b>	<b>Latin name</b>	<b>Timeline</b>	<b>Habitat</b>
<b><i>Dispues di pakyo</i></b>	Immediately after a strong storm, especially after a typhoon, fish that have been stunned and thrown by large waves onto reef flats and raised coastal benches are collected by hand. K	Various including emperors, snappers, surgeonfish, rabbitfish, mullet, goatfish, jacks, groupers	Various including Lethrinidae, Lutjanidae, Acanthuridae, Siganidae, Mugilidae, Mullidae, Carangidae, Serranidae	prehistoric? to present	intertidal to supratidal
<b>Dropline from canoe</b>	Hook baited with live flying fish on a line attached to the canoe. A	Large pelagics	<i>Coryphaena</i> , <i>Makaira</i> , etc.	Prehistoric to 1900	Offshore, Lagoon
<b><i>Euhang</i></b>	During day or night, fishers run their hands in the crevices along river embankments. Sometimes one hand is moved and the other left stationary to grab the shrimp or eel. If the eel bites, the fisher clamps the thumb down on the jaw to grasp and extract the fish. A, K	freshwater prawn, freshwater eel	<i>Macrobrachium</i> , <i>Anguilla</i>	Prehistoric? to present	Rivers

<b>Technique</b>	<b>Definition</b>	<b>English name</b>	<b>Latin name</b>	<b>Timeline</b>	<b>Habitat</b>
<b><i>Fiska</i></b>	A twin-pronged metal spear on a wooden handle was used to spear fishes at night with the aid of a torch. A, K	Various, including surgeonfish, wrasses, emperors, snappers, groupers, parrotfish	Various, including Acanthuridae, Labridae, Lethrinidae, Lutjanidae, Serranidae, parrotfish	Prehistoric? to present	Reef flats, Reef slope, Lagoons, Channels
<b>Floating dropline</b>	Baited hook and line attached to a floating gourd is set in deep water. A	Flying fish	<i>Exocoetus</i>	Prehistoric to 1900	Offshore, Lagoon
<b><i>Gade'</i></b>	A 5- to 10-m bushy rope of twined coconut leaves is pushed by several people towards a pocket-shaped net set on the reef onto which those holding the braided leaf would converge, chasing fish into the basket. A	immature goatfish, immature jacks, immature mullets, immature rabbitfish	Mullidae, Carangidae, Mugilidae, Siganidae	Prehistoric to 1970?	Reef flats



<b>Technique</b>	<b>Definition</b>	<b>English name</b>	<b>Latin name</b>	<b>Timeline</b>	<b>Habitat</b>
<b><i>Gade'</i></b>	A 5- to 10-m bushy rope of twined coconut leaves is placed across a channel mouth on the outgoing tide to frighten fish into collecting behind the screen to be speared or netted. A	Various including emperors, snappers, surgeonfish, rabbitfish, mullet, goatfish, jacks, groupers	Various including Lethrinidae, Lutjanidae, Acanthuridae, Siganidae, Mugilidae, Mullidae, Carangidae, Serranidae	Prehistoric to 1960?	Channels
<b><i>Gigao ácho</i></b>	Freycinet (1834) records that stone weirs were used at one time, but no longer (by 1824). A	Various including emperors, snappers, surgeonfish, rabbitfish, mullet, goatfish, jacks, groupers	Various including Lethrinidae, Lutjanidae, Acanthuridae, Siganidae, Mugilidae, Mullidae, Carangidae, Serranidae	Prehistoric to 1800?	Lagoons, Reef flats

<b>Technique</b>	<b>Definition</b>	<b>English name</b>	<b>Latin name</b>	<b>Timeline</b>	<b>Habitat</b>
<b><i>Gigao piao</i></b>	A weir made of bamboo was set on a shallow reef to catch fish on the falling tide. Freycinet (1834) records two designs in plan view. A	Various including emperors, snappers, surgeonfish, rabbitfish, mullet, goatfish, jacks, groupers	Various including Lethrinidae, Lutjanidae, Acanthuridae, Siganidae, Mugilidae, Mullidae, Carangidae, Serranidae	Prehistoric to 1950?	Lagoons, Reef flats
<b>Gleaning</b>	In shallow water, rocks were turned to capture invertebrates. A, K	Various, including snails, clams, crabs	Gastropoda, Bivalvia, Decapoda	Prehistoric to present	Reef flats
<b><i>Guma' ácho</i></b>	Rocks were used to build "houses" or cairns for fish to sleep in and speared at night, or when being chased or herded into surround nets to make the fish hide and become easier to spear. A, K	Various including emperors, snappers, surgeonfish, rabbitfish, mullet, goatfish, jacks, groupers	Various including Lethrinidae, Lutjanidae, Acanthuridae, Siganidae, Mugilidae, Mullidae, Carangidae, Serranidae	Prehistoric to present	Reef flats

<b>Technique</b>	<b>Definition</b>	<b>English name</b>	<b>Latin name</b>	<b>Timeline</b>	<b>Habitat</b>
<b>Hand catching of turtles</b>	Turtles were spotted and captured by hand. A, K	Turtles	Various	Prehistoric to present	Offshore, Lagoons, Channels, Reef flats
<b>Hook-and-line</b>	Using modern spinning reel, fibreglass rod and monofilament line, fishers often stand at reef's edge during the day with a waist basket , sometimes of woven coconut leaf, for various species, including herbivores and seasonal spawning or recruiting immature species. A, K	Various including emperors, snappers, surgeonfish, rabbitfish, mullet, goatfish, groupers, mature or immature jacks, big-eye scad	Various including Lethrinidae, Lutjanidae, Acanthuridae, Siganidae, Mugilidae, Mullidae, Serranidae, Carangidae, <i>Selar</i>	1950? to present	Shore, Reef flat, Reef edge, Reef slope, Channels, Lagoon

<b>Technique</b>	<b>Definition</b>	<b>English name</b>	<b>Latin name</b>	<b>Timeline</b>	<b>Habitat</b>
<b><i>Kamura</i></b>	A length of twine, to 6 m, is hooked and baited, while most of its length is buried under sand. At the other end a fisher with goggles holds the line, pulling to set the hook when it is taken by a fish. A	Emperors, jacks, groupers	Lethrinidae, Carangidae, Serranidae	Prehistoric? to 1950?	Reef flats, Reef edge, Lagoons, Shore
<b><i>Lachon</i></b>	The fishermen uses goggles and walks through a seagrass bed until spotting the moving fish, which then stops to hide, relying on its camouflage. The fish is slowly approached sidelong and grabbed by hand. A	Seagrass parrotfish	Cetoscarus	1930 to 1970	Reef flats, Lagoons

<b>Technique</b>	<b>Definition</b>	<b>English name</b>	<b>Latin name</b>	<b>Timeline</b>	<b>Habitat</b>
<b><i>Lagua'</i></b>	A long rectangular net with sinkers and floats to 2 m X 5 m, its ends sewn to long poles. Fishers splash and chase fish into the net and fishers at each end raise the bottom half to catch the fish. A	Various including emperors, snappers, surgeonfish, rabbitfish, mullet, goatfish, jacks, groupers	Various including Lethrinidae, Lutjanidae, Acanthuridae, Siganidae, Mugilidae, Mullidae, Carangidae, Serranidae	Prehistoric to present	Reef flats
<b><i>Lagua hachuman</i></b>	A large conical net with a circa 3-m round opening attached to a lift line by four cords. The net was placed underneath a school of scad lured by the <i>poio</i> method, and slowly lifted to capture the fish. A	Various	Various	Prehistoric to 1950	Reef slope

<b>Technique</b>	<b>Definition</b>	<b>English name</b>	<b>Latin name</b>	<b>Timeline</b>	<b>Habitat</b>
<b><i>Lagua pola</i></b>	A large bag-shaped net of about 10-m long sewn of several sections with long wooden poles at each end; dragged along sandy bottoms as a seine. This net was also used to catch newly recruiting rabbitfish (Siganidae), which run in great numbers usually from April to June. A	Various	Various	Prehistoric to present	Lagoons, Reef moat
<b><i>Lagua popo</i></b>	Fish in rocky areas or those caught in weirs were caught with a dip net about 60 cm X 60 cm and a 1.8 m handle. A	Various	Various	Prehistoric to 1950?	Reef edge, Channels

Technique	Definition	English name	Latin name	Timeline	Habitat
<b><i>Lagua yute'</i></b>	A type of net recorded by Freycinet (1834), <i>lagoa djoti</i> , but no description was given. However, the word <i>djoti</i> is quite similar to <i>yute'</i> , which in Chamorro means to "cast away" or "discard". If this is correct, perhaps the name refers to a temporary net or curtain woven from coconut leaves. A	Unknown	Unknown	Prehistoric? to after 1824	Unknown
<b><i>Lulai</i></b>	At night, a bamboo pole and hooked, 5-m line is cast in deep water over the reef edge during low tide. A	Snappers, jacks, groupers, squirrelfish, eels	Lutjanidae, Carangidae, Serranidae, Holocentridae, Muraenidae	Prehistoric? to present	Reef flats, Reef edge, Channels
<b><i>Lumulai</i></b>	A method recorded by Fritz. Hook and line fishing in deep holes on the reef. A	Various including emperors, snappers, jacks, groupers	Various including Lethrinidae, Lutjanidae, Carangidae, Serranidae	Prehistoric to present	Reef edge, Channels, Reef flats

<b>Technique</b>	<b>Definition</b>	<b>English name</b>	<b>Latin name</b>	<b>Timeline</b>	<b>Habitat</b>
<b>Mackerel fishing</b>	Boats are moored offshore and fish are attracted with a light placed over the water, and the fish caught using a multiply hooked, hand line. A, K	Big-eye scad	<i>Selar</i>	Prehistoric? to present	Reef slope
<b>Night spearfishing</b>	Spearfishing with goggles and a flashlight at night, often over the reef, is done with a "night gun," usually a hand-made speargun to 1-m long to obtain fish sleeping or hiding in crevices. To avoid attracting sharks, the fishers pull an "m-boat", a floating container for their catch. A, K	Various including emperors, snappers, surgeonfish, rabbitfish, mullet, goatfish, jacks, groupers	Various including Lethrinidae, Lutjanidae, Acanthuridae, Siganidae, Mugilidae, Mullidae, Carangidae, Serranidae	1950 to present	Reef flat, Reef edge, Lagoons, Channels



<b>Technique</b>	<b>Definition</b>	<b>English name</b>	<b>Latin name</b>	<b>Timeline</b>	<b>Habitat</b>
<b><i>Paki</i></b>	The fisher walks down a riverbank with a rifle to shoot at freshwater eels; the concussion of the bullet on the water stuns them, and they are grabbed or speared. K	Freshwater eel	<i>Anguilla</i>	1950? to present	Rivers
<b><i>Pisao</i></b>	During day or night, a bamboo pole and hooked, 5-m line is cast in waist-deep water. A	Snappers, jacks, groupers	Lutjanidae, Carangidae, Serranidae	Prehistoric? to present	Reef flats, Reef edge, Channels

<b>Technique</b>	<b>Definition</b>	<b>English name</b>	<b>Latin name</b>	<b>Timeline</b>	<b>Habitat</b>
<b><i>Poio</i></b>	In August, a coconut full of chewed coconut meat and capped with a shaped stone was lowered into offshore water to depth and shaken to chum the water. Each day this was done, slowly raising the <i>poio</i> , and the fish with them, until in October, the fish were feeding at the surface and in range of a large, conical net placed under the school, and raised to catch them. A	Scad	<i>Decapterus</i>	Prehistoric to 1920	Reef slope, Lagoon

Technique	Definition	English name	Latin name	Timeline	Habitat
<b>Putting</b>	The crushed endosperm of the seed from the tree <i>puting</i> ( <i>Barringtonia asiatica</i> ) was placed in loosely woven bags and these put in pools or enclosed rocky areas to stun or kill fish. The root of the introduced plant <i>Derris obtusifolia</i> was also used. A, K	Various, including squirrelfish, sweepers, soldierfish	Various including Holocentridae, Pempheridae	Prehistoric? to 1900?	Reef flats
<b>SCUBA spearfishing</b>	Spearfishing is done with the aid of SCUBA, often at night to catch large fish deep on the reef, sometimes to 50 m depth. Increasingly done commercially. A, K	Various including emperors, snappers, surgeonfish, rabbitfish, mullet, goatfish, jacks, groupers	Various including Lethrinidae, Lutjanidae, Acanthuridae, Siganidae, Mugilidae, Mullidae, Carangidae, Serranidae	1980? to present	Reef slope

<b>Technique</b>	<b>Definition</b>	<b>English name</b>	<b>Latin name</b>	<b>Timeline</b>	<b>Habitat</b>
<b>Shallow bottom fishing</b>	From a boat, handlines or pole-and-lines with baited hooks are dropped to 40 to 70 m depth. A, K	Various, including wrasses, emperors, snappers, groupers, jacks	Various, including Labridae, Lethrinidae, Lutjanidae, Serranidae, Carangidae	Prehistoric? to present	Reef slope
<b>Shrimp trap</b>	A trap woven of bamboo strips is baited and held down with rocks in a stream to catch freshwater prawns. A	freshwater prawn	<i>Macrobrachium</i>	Prehistoric? to present	Rivers
<b>Sling</b>	An aluminum or fibreglass shaft tipped with three barbless, close-set metal prongs and powered by a loop of surgical rubber tubing. Used to impale fish, usually at night when hiding in crevices. Often called a "Hawaiian sling." Slings used at night are shorter than those used during the day. A, K	Various including emperors, snappers, surgeonfish, rabbitfish, mullet, goatfish, jacks, groupers	Various including Lethrinidae, Lutjanidae, Acanthuridae, Siganidae, Mugilidae, Mullidae, Carangidae, Serranidae, Scorpaenidae, Balistidae	1950? to present	Reef flat, Reef edge, Reef slope, Lagoons, Channels

<b>Technique</b>	<b>Definition</b>	<b>English name</b>	<b>Latin name</b>	<b>Timeline</b>	<b>Habitat</b>
<b><i>Sumulo'</i></b>	At night, one fisher walks in shallow water holding a torch of coconut leaf, swordgrass or a bamboo section stuffed with kerosene-soaked rags. The second fisher spears any fish seen. A	Various including emperors, snappers, surgeonfish, rabbitfish, mullet, goatfish, jacks, groupers, eels, lobsters	Various including Lethrinidae, Lutjanidae, Acanthuridae, Siganidae, Mugilidae, Mullidae, Carangidae, Serranidae, Muraenidae, Paniluridae	Prehistoric? to present	Reef flats
<b><i>Takka</i></b>	The hands were wrapped with cloth to protect against eel bites and spines and inserted into holes in the reef to grab any fishes and lobsters hiding there. A, J	Various, including surgeonfish, triggerfish, squirrelfish	Various, including Acanthuridae, Balistidae, Holocentridae	Prehistoric? to 1950?	Reef flats

<b>Technique</b>	<b>Definition</b>	<b>English name</b>	<b>Latin name</b>	<b>Timeline</b>	<b>Habitat</b>
<b><i>Talåya</i></b>	Throw nets, conical and to over 3 m in diameter. A, K	immature goatfish, immature jacks, immature mullets, immature rabbitfish	Mullidae, Carangidae, Mugilidae, Siganidae	Prehistoric? to present	Reef flats, Shore
<b><i>Tatanum</i></b>	Stones piled by large wrasses were noted. The fisher grabbed the fish as it lay hiding under the sand. A	Wrasse	<i>Novaculichthyes</i>	Prehistoric? to 1950?	Reef flats, Lagoons
<b><i>Tekken</i></b>	A monofilament gill net was set on the reef before the receding tide. In earlier times, the more visible gill nets of natural fibres were set at night. Free-swimming fish are stalked and approached from above. A, K	Various including emperors, snappers, surgeonfish, rabbitfish, mullet, goatfish, jacks, groupers	Various including Lethrinidae, Lutjanidae, Acanthuridae, Siganidae, Mugilidae, Mullidae, Carangidae, Serranidae	Prehistoric to present	Reef flats, Reef edge

Technique	Definition	English name	Latin name	Timeline	Habitat
<b>Tethering</b>	A live parrotfish was tethered with a string, attracting other parrotfish that would bite at the string. The tethered fish was drawn close to the canoe. Then a noose was used to catch the free-swimming fish. Practiced until about 1925 on Rota. A	Parrotfish	Scaridae	Prehistoric to 1920	Reef flat, Reef edge, Channels
<b>Toksa'</b>	A sharpened metal rod mounted on a wooden handle is used to impale fishes hiding in holes or large fishes swimming in <i>chenchulu</i> nets, usually with the aid of goggles. K	Various, including jacks, darts	Various, including <i>Caranx</i> , <i>Trachinotus</i>	Prehistoric? to present	Reef flats, Reef slope, Lagoons, Channels

<b>Technique</b>	<b>Definition</b>	<b>English name</b>	<b>Latin name</b>	<b>Timeline</b>	<b>Habitat</b>
<b>Torch and spear</b>	At night, during low tide in the new moon from August to December, near the reef's edge, a fisherman in a canoe would use a torch to locate parrotfish sleeping in the shallows, which were speared by a second fisherman. A	Parrotfish, crabs, lobsters	Scaridae, Decapoda	Prehistoric to 1950	Reef flat
<b>Traba</b>	Small fish are pinned with a large hook and tethered to the reef. The living fish's struggles attract large predators who become hooked. K	Various including emperors, sweetlips, snappers, groupers and jacks	Various including Lethrinidae, Haemulidae, Lutjanidae, Epinephelinae and Carangidae	Prehistoric? to present	Reef flats, Reef slope, Lagoons



<b>Technique</b>	<b>Definition</b>	<b>English name</b>	<b>Latin name</b>	<b>Timeline</b>	<b>Habitat</b>
<b>Trolling</b>	a line with a lure or baited hook is towed offshore behind a boat, originally from a sailing canoe, and now from motorboats. Guam receives federal money to moor deepwater buoys called "fish aggregation devices" or FADS to help concentrate pelagics. A, K	Various, including mahimahi, tuna, marlin, barracuda	Various, including Coryphaena, Thunnidae, Istiophoridae, Sphyraenidae	Prehistoric to present	Reef slope, Offshore
<b><i>Umefomho'</i></b>	A circa 50-cm X 50-cm coconut-leaf basket is filled quite loosely with branching coral and coral-associated fish in shallow water are driven towards it by poking into and breaking up their coral retreats. Then the basket is raised and the coral removed. A	damselfish, cardinalfish, wrasses	Pomacentridae, Apogonidae, Labridae	Prehistoric? to 1950?	Reef flats

Technique	Definition	English name	Latin name	Timeline	Habitat
<b>Umegumson</b>	Two steel, 1-m long rods, one of them hooked are used to entice, then haul out an octopus from its hole. A, K	Octopus	Octopodidae	Prehistoric? to present	Reef flats, Reef edge, Reef slope
<b>Umegumson balâti</b>	A <i>balâti</i> (the sea cucumber <i>Holothuria atra</i> ) is rubbed against the side of an octopus's retreat, releasing a toxic, reddish liquid that sinks into the hole and forces out the octopus, which is then speared, usually with a sling spear. K	Octopus	Octopodidae	Prehistoric? to present	Reef flats, Reef edge
<b>Wire weir</b>	The last large weir on Guam was in Cocos Lagoon, made of <i>tangantângen</i> ( <i>Leucaena leucocephala</i> ) wood poles supporting chicken wire. See photographs in Amesbury et al. (1986). A, K	Various including emperors, snappers, surgeonfish, rabbitfish, mullet, goatfish, jacks, groupers	Various including Lethrinidae, Lutjanidae, Acanthuridae, Siganidae, Mugilidae, Mullidae, Carangidae, Serranidae	1950? to 1990	Lagoons, Reef flats

Table II. The 67 most abundant families or subfamilies of fishes in the Mariana Islands (including large pelagics), their main habitats and the historically main techniques used to fish them. Family names from Myers and Donaldson (2003). See Table I for explanation of fishing techniques. "Exquiline" = live attached to large fishes or turtles; "Inquiline" = live within the body cavities of large echinoderms or bivalve mollusks; "Freshwater" = rivers, lakes, swamps.

<b>Taxon</b>	<b>Common Name</b>	<b>Habitat</b>	<b>Technique</b>
<b>Acanthuridae</b>	surgeonfishes and unicornfishes	Reef slope, Lagoon, Reef flat	<i>Gigao, Chenchulu, Guma' ácho</i> , hand catching in holes, <i>Fiska, Sumulo', Tekken</i> , day spearing, night spearing, sling, Hook-and-line
<b>Alopiidae</b>	thresher sharks	Offshore	No records
<b>Anamolopidae</b>	flashlightfishes	Reef slope, Deepwater	No records
<b>Anguillidae</b>	freshwater eels	Freshwater	<i>Fiska</i> , hand catching, <i>Paki</i>
<b>Antennariidae</b>	frogfishes	Reef slope, Lagoon, Reef flat	No records
<b>Anthiinae</b>	anthiases	Reef slope, Lagoon, Deepwater	No records
<b>Apogonidae</b>	cardinalfishes	Reef slope, Lagoon, Reef flat	<i>Umefomho'</i>
<b>Atherinidae</b>	silversides	Reef slope, Lagoon, Reef flat	No records

<b>Common</b>			
<b>Taxon</b>	<b>Name</b>	<b>Habitat</b>	<b>Technique</b>
<b>Aulostomidae</b>	trumpetfishes	Reef slope, Lagoon, Reef flat	<i>Chenchulu</i> , sling
<b>Balistidae</b>	triggerfishes	Reef slope, Lagoon, Reef flat	<i>Gigao</i> , <i>Chenchulu</i> , <i>Guma' ácho</i> , <i>Sumulo'</i> , sling, <i>Takka</i>
<b>Belonidae</b>	needlefishes	Lagoon, Reef flat	<i>Chenchulu</i>
<b>Blenniidae</b>	blennies	Reef slope, Lagoon, Reef flat, Mangrove	sling (fished for bait)
<b>Bothidae</b>	lefteye flounders	Lagoon, Reef flat	<i>Fiska</i> , <i>Sumulo'</i> , sling
<b>Caesionidae</b>	fusiliers	Reef slope	day spearing
<b>Carangidae</b>	jacks; trevallys	Reef slope, Offshore, Lagoon, Reef flat, Deepwater	Dropline from canoe, <i>Poio</i> , <i>Lagua hachuman</i> , <i>Talaya</i> , <i>Chenchulu</i> , <i>Lumulai</i> , <i>Kamura</i> , <i>Pisao</i> , <i>Lulai</i> , <i>Batangga</i> , <i>Toksa'</i> , <i>Fiska</i> , <i>Gade'</i> , <i>Tekken</i> , <i>Traba</i> , day spearing, night spearing, <i>Atulai</i> gill net, Hook-and-line, Shallow bottom fishing, Deep bottom fishing, Trolling, Mackerel fishing
<b>Carapodidae</b>	pearlfishes	Inquiline	Not fished
<b>Carcharhinidae</b>	requiem sharks	Offshore, Reef slope, Reef flat, Lagoon	<i>Gigao</i> , <i>Chenchulu</i>
<b>Chaetodontidae</b>	butterflyfishes	Reef slope, Lagoon, Reef flat	No records

<b>Common</b>			
<b>Taxon</b>	<b>Name</b>	<b>Habitat</b>	<b>Technique</b>
<b>Chanidae</b>	milkfish	Lagoon	<i>Gigao, Tekken</i>
<b>Cirrhitidae</b>	hawkfishes	Reef slope, Lagoon, Reef flat	No records
<b>Coryphaenidae</b>	dolphinfishes	Offshore	Dropline from canoe, day spearing, Trolling
<b>Dasyatidae</b>	stingrays	Reef slope, Lagoon, Reef flat	No records
<b>Diodontidae</b>	porcupinefishes	Reef slope, Lagoon, Reef flat	No records
<b>Echeneidae</b>	remoras	Exquiline	No records
<b>Eleotridae</b>	sleepers; gudgeons	Reef slope, Lagoon, Reef flat	No records
<b>Ephippidae</b>	batfishes; spadefishes	Reef slope, Lagoon	No records
<b>Epinephelinae</b>	groupers	Reef slope, Lagoon, Reef flat, Deepwater	<i>Gigao, Chenchulu, Lumulai, Kamura, Pisao, Lulai, Batangga, Fiska, Sumulo', Tekken, Traba, day spearing, night spearing, sling, Hook-and-line, Shallow bottom fishing, Deep bottom fishing</i>
<b>Exocoetidae</b>	flyingfishes	Offshore	Floating dropline
<b>Fistulariidae</b>	cornetfishes	Reef slope, Lagoon, Reef flat	<i>Chenchulu</i>

<b>Common</b>			
<b>Taxon</b>	<b>Name</b>	<b>Habitat</b>	<b>Technique</b>
<b>Gerreidae</b>	mojarras	Reef flat	<i>Gigao, Talaya, Chenchulu, Fiska, Tekken</i> , day spearing
<b>Ginglymostomatidae</b>	nurse sharks	Reef slope, Lagoon	No records
<b>Gobiidae</b>	gobies	Reef slope, Lagoon, Reef flat	No records
<b>Haemulidae</b>	sweetlips; grunts; javelinfishes	Reef slope, Lagoon, Reef flat	<i>Gigao, Chenchulu, Batangga, Lumulai, Fiska, Sumulo', Traba</i> , day spearing, night spearing, sling, Hook-and-line, Shallow bottom fishing
<b>Hemirhamphidae</b>	halfbeaks	Lagoon, Reef flat	<i>Chenchulu</i>
<b>Holocentridae</b>	soldierfishes and squirrelfishes	Reef slope, Lagoon, Reef flat	<i>Guma' ácho, Lumulai, Puting, Takka, Lulai, Fiska, Sumulo'</i> , day spearing, sling
<b>Istiophoridae</b>	marlins	Offshore	Dropline from canoe
<b>Kuhliidae</b>	flagtails	Freshwater	Not fished
<b>Kyphosidae</b>	rudderfishes; sea chubs	Reef slope, Lagoon	<i>Chenchulu, Guma' ácho, Lumulai</i> , day spearing, night spearing, sling, Hook-and-line
<b>Labridae</b>	wrasses	Reef slope, Lagoon, Reef flat	<i>Gigao, Chenchulu, Lumulai, Tatanum, Fiska, Sumulo', Takka, Tekken</i> , day spearing, night spearing, sling, Hook-and-line, Shallow bottom fishing
<b>Leiognathidae</b>	ponyfishes;	Reef flat	<i>Gigao, Talaya, Chenchulu, Tekken</i>

<b>Taxon</b>	<b>Common Name</b>	<b>Habitat</b>	<b>Technique</b>
	slipmouths		
<b>Lethrinidae</b>	emperors	Reef slope, Lagoon, Reef flat	<i>Gigao, Chenchulu, Kamura, Fiska, Tekken, Traba</i> , day spearing, night spearing, sling, Hook-and-line, Shallow bottom fishing
<b>Lutjanidae</b>	snappers	Reef slope, Lagoon, Reef flat, Deepwater	<i>Gigao, Guma' ácho, Lumulai, Pisao, Lulai, Batangga, Fiska, Sumulo', Tekken, Traba</i> , day spearing, night spearing, sling, Hook-and-line, Shallow bottom fishing, Deep bottom fishing
<b>Mobulidae</b>	manta rays	Reef slope, Offshore, Lagoon	No records
<b>Molidae</b>	molas	Offshore	No records
<b>Mugilidae</b>	mulletts	Reef slope, Lagoon, Reef flat	<i>Gigao, Chenchulu, Sumulo', Tekken</i>
<b>Mullidae</b>	goatfishes	Reef slope, Lagoon, Reef flat	<i>Weir, Talaya, Chenchulu, Lumulai, Sumulo', Gade', Tekken</i> , day spearing, night spearing, sling
<b>Muraenidae</b>	moray eels	Reef slope, Lagoon, Reef flat	<i>Guma' ácho, Lumulai, Lulai, Sumulo'</i> , day spearing, sling
<b>Myliobatidae</b>	eagle rays	Reef slope, Lagoon	No records
<b>Nemipteridae</b>	threadfin breams	Reef flat	No records

<b>Taxon</b>	<b>Common Name</b>	<b>Habitat</b>	<b>Technique</b>
	and spinecheeks		
<b>Ostraciidae</b>	trunkfishes;	Reef slope, Lagoon,	No records
	boxfishes	Reef flat	
<b>Pempheridae</b>	sweepers	Reef slope, Lagoon, Reef flat	<i>Guma' ácho, Puting, Sumulo'</i> , day spearing, sling
<b>Plesiopidae</b>	prettyfins	Reef flat	No records
<b>Pomacanthidae</b>	angelfishes	Reef slope, Lagoon, Reef flat	No records
<b>Pomacentridae</b>	damsel-fishes	Reef slope, Lagoon, Reef flat	<i>Umefomho'</i>
<b>Priacanthidae</b>	bigeyes; glasseyes	Reef slope, Lagoon, Reef flat, Deepwater	day spearing, sling
<b>Rhincodontidae</b>	whale shark	Offshore	No records
<b>Scaridae</b>	parrotfishes	Reef slope, Lagoon, Reef flat	Torch and spear, Tethering, <i>Chenchulu, Lachon, Fiska, Sumulo', Tekken</i> , day spearing, night spearing, sling
<b>Scombridae</b>	tunas and mackerels	Offshore, Deepwater	Dropline from canoe, <i>Batangga</i> , day spearing, Trolling
<b>Scorpaenidae</b>	scorpionfishes and stonefishes	Reef slope, Lagoon, Reef flat	Sling



<b>Common</b>			
<b>Taxon</b>	<b>Name</b>	<b>Habitat</b>	<b>Technique</b>
<b>Siganidae</b>	rabbitfishes; spinefoots	Reef slope, Lagoon, Reef flat	<i>Lagua hachuman, Talaya, Chenchulu, Guma' ácho, Takka, Fiska, Sumulo', Gade', Tekken</i> , day spearing, night spearing, sling, Hook-and-line
<b>Sphyraenidae</b>	barracudas	Reef slope, Offshore, Lagoon	Dropline from canoe, <i>Batangga</i> , Trolling
<b>Sphyrnidae</b>	hammerhead sharks	Offshore, Lagoon	No records
<b>Synanceidae</b>	stonefishes	Reef slope, Lagoon, Reef flat	<i>Guma' ácho, Fiska</i> , sling
<b>Syngnathidae</b>	pipefishes and seahorses	Reef slope, Lagoon, Reef flat	No records
<b>Synodontidae</b>	lizardfishes	Reef slope, Lagoon, Reef flat	<i>Fiska, Sumulo'</i> , sling
<b>Tetraodontidae</b>	puffers	Reef slope, Lagoon, Reef flat	No records
<b>Zanclidae</b>	moorish idol	Reef slope, Lagoon, Reef flat	No records

TABLE III. Chamorro names for fishes mentioned in Tables I and II. Based on Kerr (1990).

<b>English name</b>	<b>Chamorro name</b>	<b>Latin Name</b>
barracuda	<b>álu</b>	Scombridae
big-eye scad	<b>atulai</b>	<i>Selar</i>
cardinalfish	<b>lanse</b>	Apogonidae
clams	<b>hima</b>	Tridacnidae
crabs	<b>panglao</b>	Decapoda
damsel fish	<b>fohmo</b>	Pomocentridae
darts	<b>atot</b>	Eleotridae
eels	<b>hák mang, titohge</b>	Muraenidae
emperors	<b>lililok, mafute'</b>	Lethrinidae
flying fish	<b>gága</b>	Exocoetidae
freshwater eel	<b>hasule</b>	<i>Anguilla</i>
freshwater prawn	<b>uhang</b>	Macrobrachium
goatfish	<b>satmoneti</b>	Mullidae
groupers	<b>gá dau</b>	Epinephelinae
immature goatfish	<b>ti'ao</b>	Mullidae
immature jacks	<b>i'i'</b>	Carangidae
immature mullets	<b>á gguas</b>	Mugilidae
immature rabbitfish	<b>mañáhak</b>	Siganidae
jacks	<b>tarakitu</b>	Carangidae
lobsters	<b>mahonggang</b>	Paniluridae
mahimahi	<b>botá gue'</b>	<i>Coryphaena</i>
marlin	<b>marlin, bātu</b>	<i>Makaira</i>
mullet	<b>laiguan</b>	Mugilidae
octopus	<b>gamson</b>	Octopodidae
parrotfish	<b>laggua, atuhong, loro</b>	Scaridae
rabbitfish	<b>sehyon</b>	Siganidae

<b>English name</b>	<b>Chamorro name</b>	<b>Latin Name</b>
scad	<b>atulai</b>	<i>Selar</i>
seagrass parrotfish	<b>lacha</b>	<i>Leptoscarus</i>
snails	<b>do'gas, ilileng</b>	Gastropoda
snappers	<b>tagâfi, kaka'ka'</b>	Lutjanidae
soldierfish	<b>sagamilon</b>	<i>Holocentrus</i>
squirrelfish	<b>sâksâk</b>	<i>Myripristis</i>
surgeonfish	<b>hugupau, hiyok, hangon, tâtaga', odda'</b>	Acanthuridae
sweepers	<b>lanse</b>	Pempheridae
sweetlips	<b>hamâla</b>	Haemulidae
triggerfish	<b>pulonon, sâsâddok</b>	Balistidae
tuna	<b>tuna, maguro'</b>	Scombridae
turtles	<b>haggon</b>	Chelonidae
wrasse	<b>palakse', lalacha' mâmâ'te, tanggison</b>	Labridae

