

The Crustacean and Molluscan Fisheries of Honduras

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Introduction

Honduras, bordered by Nicaragua in the south and Guatemala and El Salvador on the west, has fisheries for crustaceans and mollusks along its 575 km north coast and in the Gulf of Fonseca (70 km across) in the south (Fig. 1). Along the northern coast, artisanal fishermen land Caribbean spiny lobsters, *Panulirus argus*; white shrimp, *Penaeus schmitti*; blue crabs, *Callinectes* sp.; queen conchs, *Strombus gigas*; coquina clams, *Donax denticulata*; and marsh-clams, *Polymesoda placans*, while industrial-scale fishermen land pink shrimp, *P. notialis*, white shrimp, spiny lobsters, and queen conchs. In the Gulf of Fonseca, a few mollusk species are landed, and extensive shrimp farming is practiced. Mollusks are gathered by hand, and no rakes or dredges are used. The artisanal boats are almost entirely wooden dugout canoes¹, while indus-

¹Dugout canoes are made of soft, light-weight wood, and they are very buoyant. Paddles are made from the same wood. The canoes last about 15 years if painted and taken out of water when not in use. Small holes in them can be repaired.

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ABSTRACT—Honduras has many communities of artisanal fishermen who land various species of crustaceans and mollusks, using hands, nets, traps, and free diving from shore and from dugout canoes. It also has industrial fisheries for spiny lobster, *Panulirus argus*; queen conch, *Strombus gigas*; and mainly pink shrimp, *Penaeus notialis*, using traps, scuba divers, and trawl nets.

trial-scale vessels may be 21–27 m long, constructed of steel or fiberglass; most are made in the State of Louisiana. Fishermen harvest spiny lobsters (Phillips et al., 1994) and queen conchs (Appeldoorn and Rodriguez, 1994) throughout the Caribbean region, but few details depicting gear and methods in Honduras are described in the literature. Previously published articles on Caribbean fisheries for blue crabs, clams, and shrimp are scarce.

We gathered the information for this paper during a survey from 29 February to 13 March 1996 along the north coast, observing and photographing fishing gear and interviewing some 40 government officials, fishermen, managers of fishing co-operatives, gear suppliers, and boat owners. Information regarding mollusks in the Gulf of Fonseca was provided by government officials.

Habitats

The northern Honduras coast, which lies in an east-west direction and is slightly curved, usually is washed by a gentle surf of the Caribbean Sea. The coast has four small, shallow lagoons and one large lagoon. Laguna de Alvarado, Laguna de Los Micos, Laguna de Guaimorte, and Laguna de Brus are 2–17 km across and mostly 0.9–1.2 m deep. Laguna de Los Micos appeared to be closed to the sea in March 1996. The status of another small lagoon, Laguna de Ibans, was not determined. Laguna de Caratasca is located in the Miskitia area in the east and is, by far, the largest lagoon, 50 km long and 11 km wide; it is mostly 2.4–2.7 m deep. Laguna de Caratasca is the largest es-

tuary in Central America. Rivers run into all the lagoons, except Laguna de Alvarado. In early March, surface salinity in Laguna de Brus was 14‰ at its south shore, 18‰ mid-bay, and 32‰ inside the bay opening to the sea, while surface salinity in Laguna de Caratasca was 5.5‰ at the south shore, 9.5‰ in mid-bay, and 4.5‰ at Caukira on its north shore. After a 3-day period of intermittent rains, the salinity was 4.5‰ at the south shore of Laguna de Caratasca. During the rainy season, April–November, the salinity probably is much lower in the lagoons. The lagoons have firm sandy edges, but are mostly muddy in their main regions; waters are turbid.

Lying 27–52 km off the north coast are the Bay Islands: Utila, 14 km long; Roatan, 52 km long; and Guanaja, 17 km long. They are generally surrounded by coral reefs. The tidal range around Roatan Island is 30–35 cm, and water temperatures usually range from 26° to 29°C. About 10 km from the north coast of Honduras are the tiny Cayos Cochinos islands.

The broad shelf extending off northeastern Honduras and Nicaragua is where the principal fisheries for lobsters, shrimp, and conchs are conducted. Lobsters commonly are associated with rocky or spongy bottoms, but can be found on sand and in holes, whereas conchs associate with sandy bottoms commonly with seagrasses. Inshore near Puerto Cortes, artisanal fishermen find lobsters on bottoms having large rocks and trenches. The government considers artisanal fishermen as those who land less than 3 metric tons (t) per year, are independent, with fishing as

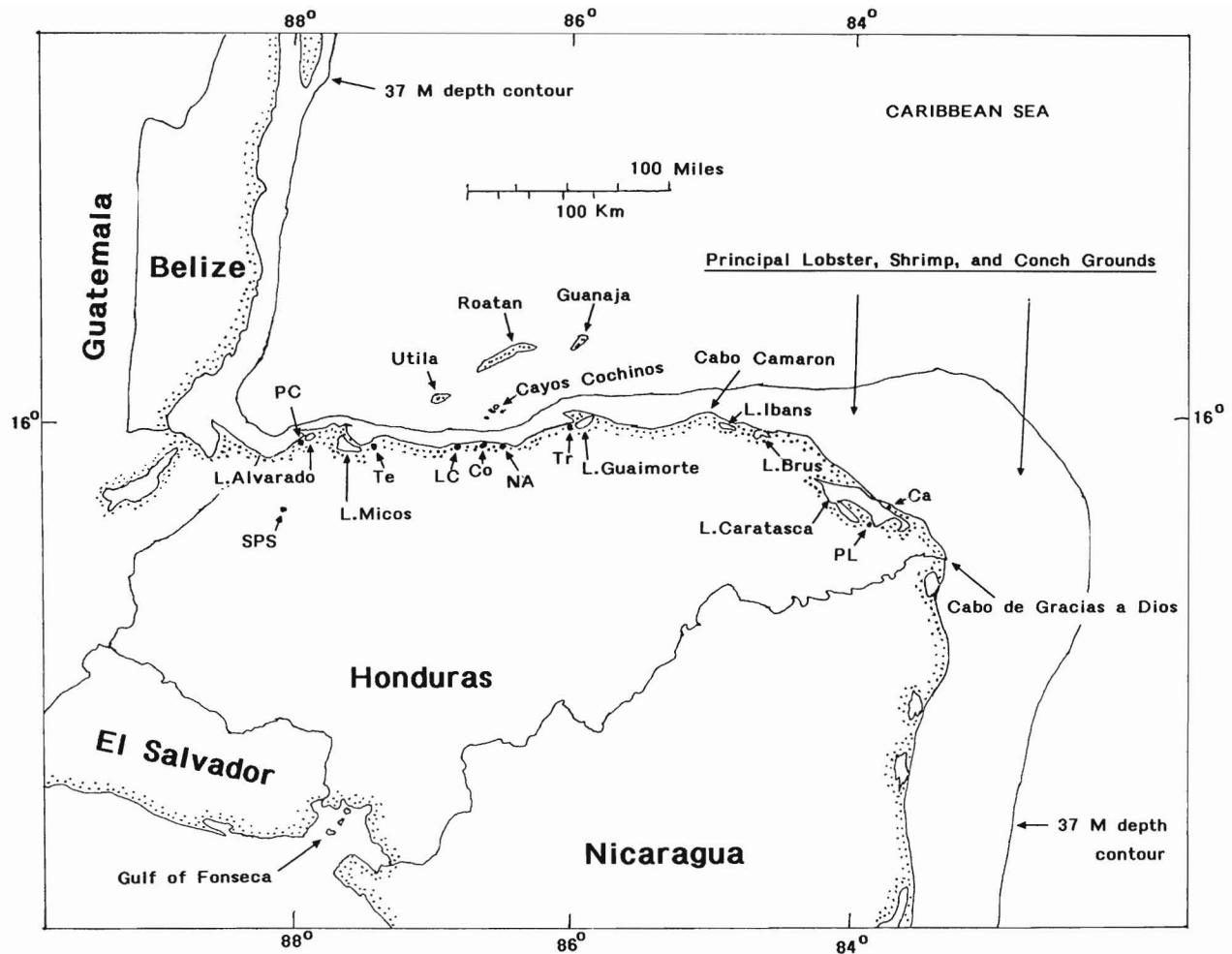


Figure 1.—The Honduras coastline with the lagoons, coastal cities, and villages mentioned in the text. Also included is the approximate 37 m depth contour off the north coast. L. Alvarado = Laguna de Alvarado, SPS = San Pedro Sula, PC = Puerto Cortes, L. Micos = Laguna de Los Micos, Te = Tela, LC = La Ceiba, Co = Corozal, NA = Nueva Armenia, Tr = Trujillo, L. Guaimorte = Laguna de Guaimorte, L. Caratasca = Laguna de Caratasca, L. Ibans = Laguna de Ibans, L. Brus = Laguna de Brus, PL = Puerto Lempira, Ca = Caukira.

their only business. Artisanal fishermen must follow the same regulations and seasons as industrial fishermen.

Honduras Government Administration

The Honduras government sets several regulations to conserve its fisheries, including closed seasons (Table 1). It requires artisanal fishermen to pay a license fee of \$1.00/year; licenses for industrial corporations are \$10/year. It has set a minimum lobster size: Its tail must measure at least 5.5 inches. No minimum length is set for queen conchs,

except where it is 22 cm for those to be exported. The government will confiscate undersized catches.

Historical Molluscan Fishing

Mollusk shells are present in the Mayan ruins located in several places in the country. The shells are of freshwater and marine origin, with the marine shells coming from both the Caribbean and Pacific coasts of Honduras. Most shells are associated with burials, while shells of the Caribbean helmet, *Cassia tuberosa*, were used as horns and musical instruments, and part of the

Table 1.—Numbers of fishing boats and fishermen and landings of fish products in Honduras in 1995. Source: Department of Natural Resources, Tegucigalpa.

Item	Number
Vessels or fishermen	
Lobster trap and dive vessels ¹	200
Shrimp vessels	113
Conch dive vessels	15
Finfish vessels	23
Small artisanal boats	4,855
Artisanal fishermen	5,936
Aquatic production	Landings (t)
Wild shrimp	2,743
Farmed shrimp	9,028
Lobster tails	1,830
Conch meats	291
Finfish	359

¹ Data from J. Rukin, president of fishermen's cooperative, Oak Ridge, Roatan Island.

queen conch shells were used as spoons (Pastor²). The Museo De Antropologia E Historia in San Pedro Sula has a collection of shells from various Honduras Mayan ruins and illustrations of indigenous peoples with shells of *Busycon* and other species (Fig. 2, 3). The shell of the horse conch, *Pleuroploca gigantea*, could be of Honduras Carib-

²Teresa Pastor, Director, Museo De Antropologia E Historia, San Pedro Sula. Personal commun., 1996.

Table 2.—Honduras' closed seasons for crustaceans and conchs.

Species	Months
Lobster ¹	March 16–July 31
Shrimp	February 1–June 30
Queen conch	March 16–August 31

¹ Lobster tails must measure at least 5 inches long.

bean Sea origin, but those of *Busycon* sp. probably come from Mexico's Gulf of Mexico area.

The authors made several inquiries to people around every lagoon about whether ancient shell middens are present. Few apparently exist as they do on the shores of Bahia de Bluefields in Nicaragua (MacKenzie, In Press).

Fishing for Lobsters and Conchs

Earlier Artisanal Fishing

Before the mid-1980's, artisanal fishermen around the bay islands of Guanaja, Roatan, and Utila used to catch lobsters near shore by free diving without mask or tank. Each carried a stick with a fork at the end to hold a lobster against the bottom before at-

tempting to grab it with a free hand. He then came to the surface (Miller³). Another method used more sparingly to catch lobsters at night was to drift across a bottom in water 0.9–1.5 m deep in a dugout canoe holding a torch at the water surface to reflect light from the eyes of a lobster. The fisherman then descended to catch it (Galindo⁴). By free diving, fishermen also caught conchs which were so abundant in places some could be seen from shore in clear waters (Miller³). As a consequence of organized industrial fishing in the 1970's and early 1980's, lobsters and conchs became much scarcer in shallow coastal waters (Galindo⁴).

Current Artisanal Fishing

An estimated 50 fishermen from the Bay Islands currently seek lobsters and conchs using only mask and fins. Since fishermen seek mostly lobsters, they dive in shallow rocky areas. A good day's catch for a fisherman is about 5 pounds of lob-

³Marston Miller, retired artisanal fisherman, Roatan Island. Personal commun., 1996.

⁴Julio Galindo, Manager, Anthony's Key Resort, Roatan Island. Personal commun., 1996.



Figure 2.—Part of shell display from Mayan ruins in Museo De Antropologia E Historia in San Pedro Sula.



Figure 3.—Drawing, in the Museo De Antropologia E Historia in San Pedro Sula, of a Mayan in festival costume showing large gastropod shell attached to his arm.

ster tails⁵ and 2–3 conchs. Fishermen sell most of the lobsters, but they eat some lobsters and the conchs. Lobster and conch fishing is not allowed on the north-west side of Utila, the north side of Roatan, and the northwest side of Guanaja because the Honduran government has set aside the areas as wildlife refuges, but it is allowed elsewhere (Miller³).

Along the north coast of the Honduras mainland from the Puerto Cortes area eastward to villages such as Nueva Armenia, artisanal fishermen catch lobsters in traps and by diving. In Puerto Cortes and nearby villages, about nine fishermen using large dugout canoes with small motors each set from 10 to 150 individually buoyed lobster traps (Fig. 4). Some use small strings of traps weighted

at one end with a stone; these are made of wooden slats, have an entrance at the top, measure 75 × 45 × 45 cm, and weigh 50–60 pounds when dry. Set at distances of 2.4–3.7 km from shore at typical depths of 37–46 m on hard sand bottom, they last 3–4 months; mud bottom has few or no lobsters. Traps are baited with cowhide, which costs US\$9.50–11.50 for a complete hide, but also with shark or ray hide. Hides are preserved with salt in barrels (Ebanks⁶).

Fishermen setting 150 pots lift 50 pots/day and go with crews of three besides themselves. Three men pull the trap rope through a block while the fourth man steers the boat, propelled by a 30 hp outboard motor. Lobsters are taken from traps with gloved hands or

hooks. It takes the crew 2.5–3 hours to lift 50 traps if they do not have to move any to another site (Ebanks⁶). The fisherman with 10 traps gets 8–30 pounds of lobster tails/day. The best lobster catches follow periods of rough weather (Brito⁷).

In the Puerto Cortes area, seven artisanal divers use scuba gear to catch lobsters and conchs. They find lobsters on rocky bottoms at depths of 22–26 m. Two divers go on each canoe, and on their best days may get 20–40 pounds of lobster tails (personal commun.).

The Puerto Cortes fishermen sell most of their lobsters through a cooperative formed in 1995, but some are peddled locally (Fig. 5). This group of fishermen (personal commun.) has sold 5,000 to 10,000 pounds of lobster tails/year.

⁵A whole lobster weighs 2.5 times more than a tail alone.

⁶Carlos Ebanks, artisanal fisherman, Puerto Cortes.

⁷Ramon Brito, secretary, artisanal fisherman's group, Puerto Cortes.



Figure 4.—Spiny lobster traps near Puerto Cortes.

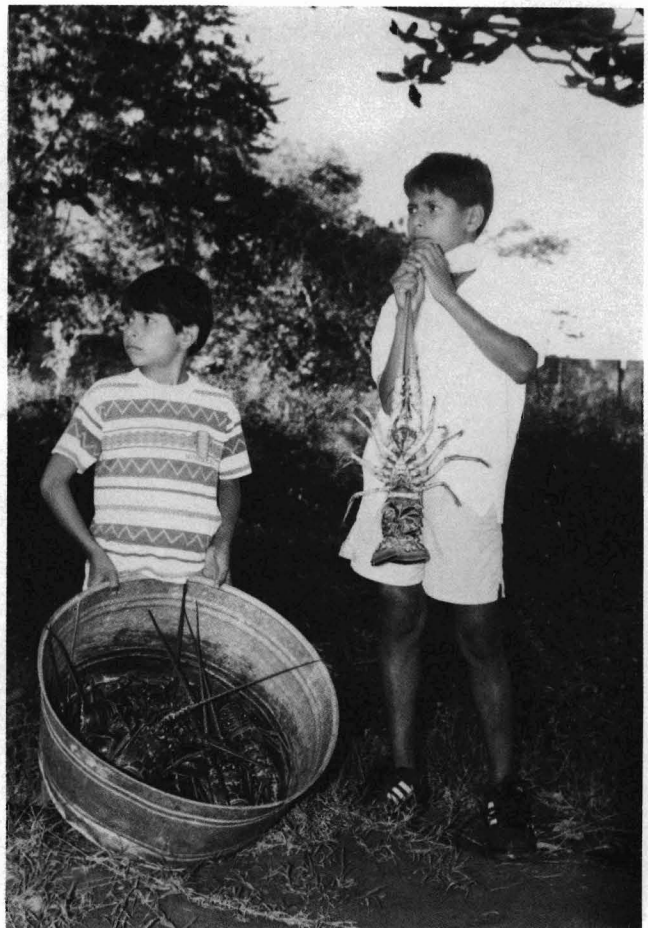


Figure 5.—Sons of a fisherman peddling his catch of spiny lobsters on a roadside near Puerto Cortes.



Figure 6.—Dugout canoes and homes in the village of Nueva Armenia.

In coastal villages eastward of La Ceiba, some fishermen catch lobsters with traps, which they lift every three days, but mostly they go after lobsters and conchs by free diving with a mask and fins. For example, in the Garifuna village of Nueva Armenia (Fig. 6), three fishermen each have 10–50 lobster traps baited with cowhide and also dive for lobsters and conchs; 17 others only dive for them, using dugout canoes with sails. The divers free dive as far as 6 km from shore to depths of 2.7–3.7 m; they used to go farther and dive around the Cayos Cochinos islands, but this is now a reserve where lobster and conch fishing is prohibited. The fishermen can remain underwater about 1 minute. They catch lobsters with a loop of string attached to a stick; a diver puts the loop (Fig. 7) over an antenna of a lobster which is in a defensive position, draws it tightly, swims to the surface trailing the prey, and hands the lobster to the tenderman in his dugout canoe. A diver may get 10–20 lobsters, and, com-



Figure 7.—Artisanal fisherman in Nueva Armenia demonstrating how he places loop of string over an antenna of a spiny lobster under water.

monly, 10–20 conchs/day, but sometimes none (Zuniga⁸).

The artisanal fishermen remove the heads from lobsters when they get ashore. They sell their catches to middlemen who in 1996 paid them US\$2.38/pound for lobster tails and US\$1.43/pound for conch meat. The middleman sells the meats in the city of La Ceiba and receives US\$4.76/pound for lobster tails and US\$2.48–2.86/pound for conch meat (Zuniga⁸). Conch meat sold for US\$3.43/pound in markets in San Pedro Sula and Tela in March 1996 (personal observ.).

Earlier Industrial Diving

Since at least 1970, commercial diving for lobsters and conchs has been conducted on an industrial scale. In the 1970's and early 1980's, vessels carried 5–10 divers each to areas where depths ran 2.5–12 m. Divers proceeded from the mother vessels in dugout canoes paddled by tendermen and dove with masks and fins but without tanks. When they caught a lobster or conch, they ascended, put it in the canoe, and descended again. In 1976, the divers got 25 centavos/pound for conch meat and 1 lempira/pound for lobster tails; besides, they paid for their own food (Fermin⁹).

Current Industrial Diving

The industrial divers depleted the inshore grounds of lobsters and conchs but, spurred by a strong demand for lobster tails and a consistent demand for conch meat in the United States, the diving fishery for lobsters and conchs expanded substantially when scuba gear was introduced in 1984. This gear allows fishing in much deeper waters. Mother vessels average 23 m long but can be 27 m long (Fig. 8); hired divers are indigenous males from the Miskitia regions of Honduras. Vessels carry 12–24 divers who now begin working as young as 15 years old with most working into their 40's; in 1996, the oldest diver was 56 years old. Each vessel carries 90–100 scuba tanks and an air compressor, and also supplies the masks,

regulators, fins, and bags for the divers. It also carries 12–24 dugout canoes¹⁰ (Fig. 9), one for each diver and tenderman; the canoes are owned by the divers. The tendermen are teenagers, who paddle the canoe following bubbles of the diver while he is below. A canoe carries three diving tanks (each filled with 3,000 pounds of air) as well as the lobsters or conch meats the diver has caught (Fermin⁹).

Divers usually harvest at depths of 15–24 m, but range to 37 m in the lobster and conch grounds off the northeastern Honduras coast (Fig. 1). Until the early 1990's, they ranged to 43 m, but too many accidents occurred at depths between 37 and 43 m, and the maximum limit now is set at 37 m (Fermin⁹, Martinez¹¹).

Since the mid-1980's, the number of divers employed to catch lobsters and conchs from Honduran industrial vessels has increased sharply, currently totalling about 1,800. In addition, there are 1,800 males who help the divers as tenders in the dugout canoes. Roughly 60 vessels, using scuba divers, fish for lobsters, and 15 vessels fish for conchs. In some coastal villages in the Miskitia, a large portion of local males were working on the boats; in the town of Cauquira, with a population of about 3,000 people, 370 were employed as divers in 1996 (Fermin⁹, Martinez¹¹). The divers (personal commun.) learn their trade by snorkeling as boys and, as teenagers, by working as tendermen.

Operations

During seasons for lobsters and conchs, the vessels make 12 trips/year, each trip lasting 12 days. Between trips, the crews come in for 5 or 6 days to sell the catch and rest. When a vessel is on a lobster or conch ground it is either anchored or adrift, the canoes are pushed into the water, divers and tendermen board them with the gear, and they are paddled off in different directions. The divers put on tank, mask, and fins, take the bag, and enter the

water and descend to the bottom to search for lobsters or conchs in the clear Caribbean water. The divers carry a 60 cm handle with a large hook on its end to catch the lobsters (Fig. 10). Lobsters are hooked under the thorax and put in the bag. Lobsters are taken whole, but only the meat of conchs is taken. When going for conchs, the divers carry a chipping hammer with a knife tied onto it (Fig. 11). The hammer is used to crack a hole in the second whorl of the conch's shell, and the knife is inserted to cut the muscle attachment from the shell. The diver pulls out the meat, puts it in his bag, and leaves the shell on the bottom (Fermin⁹). A small quantity of shell is saved on a few vessels to sell to a company in San Pedro Sula, which uses it for making tiles (Galindo⁴). The divers (personal commun.) also collect West Indian topsnails, *Cittarium pica*, to eat aboard their vessels.

After about 45 minutes, air supplies are exhausted, and the divers, after stopping to decompress twice on the ascent, come to the surface with their catches. They may put on another tank of air for a second descent, or return to the mother vessel. Each diver works on the bottom about 4 hours and uses 6–9 tanks/day (Fermin⁹).

When the tenderman and diver return to the mother vessel, they behead the lobsters and weigh the tails. When they are after conchs, they clean the meats and weigh them. In 1–2 dives, a diver gets about 10–12 pounds of lobster tails, 15–20 pounds of conch meats. On extra good days, a diver may get 30–40 pounds of lobster tails, 100–120 pounds of conch meats. The crew on a vessel puts the conch meats in plastic bags holding 40 pounds (Fermin⁹).

The lobster tails and conch meat are frozen aboard the vessels. A large vessel with 24 divers may land 1,500–6,000 pounds of lobster tails, or 15,000–30,000 pounds of conch meat/12-day trip. A vessel with 16 divers can harvest about 10,000 pounds of conch meat; on an extra successful trip, it will land about 15,000 of conch meat (Almendares¹²). The divers are paid

⁸Malaquis Zuniga, artisanal fisherman, Nueva Armenia.

⁹Capil Ulopio Fermin, 20-year industrial diver.

¹⁰Dugout canoes last only two years when used on diving vessels due to rough handling.

¹¹Robinson Alvarez Martinez, secretary, HOMIBAT, Puerto Lempira.

¹²Wilson Almendares, captain of diving vessel *Hy Hopes*, Roatan.



Figure 8.—Mother vessel used for lobster and conch fishing docked in La Ceiba.



Figure 9.—Dugout canoes used by scuba divers piled on stern of mother vessel docked in La Ceiba.



Figure 10.—Divers carry a metal stick with a large shark hook wired onto it to catch lobsters.

according to their catch: 20% of the selling price of lobster tails or conch meat. In 1996, divers received US\$1.90/pound for lobster tails and US\$0.95/pound for conch meat. Out of this, they pay the tendermen 25% of what they make. Divers may earn from US\$1,430–1,900/year; the best make US\$3,800–4,800/year (Fermin⁹). The catches are taken to Roatan, where they are repacked in four plants and then sold principally in the United States¹³ but also in Honduras. The vessels approach La Ceiba for provisions and then go to the Miskitia area for divers.

HOMIBAT: Divers' Organization

A substantial number of divers have become injured, and some have died during the work. There are no government regulations governing the treatment of divers aboard the vessels. During a 5-year period, 1989–94, when many divers worked at depths between 37 and 43 m, there were 280 diving accidents, nearly all related to decompression sickness or “the bends.” In 1995, of the 1,800 working, 70 became sick from “the bends”; 58 were able to return to diving, but 12 were too badly injured to dive

¹³All products exported from Honduras to the United States are subjected to rigid sanitation requirements.

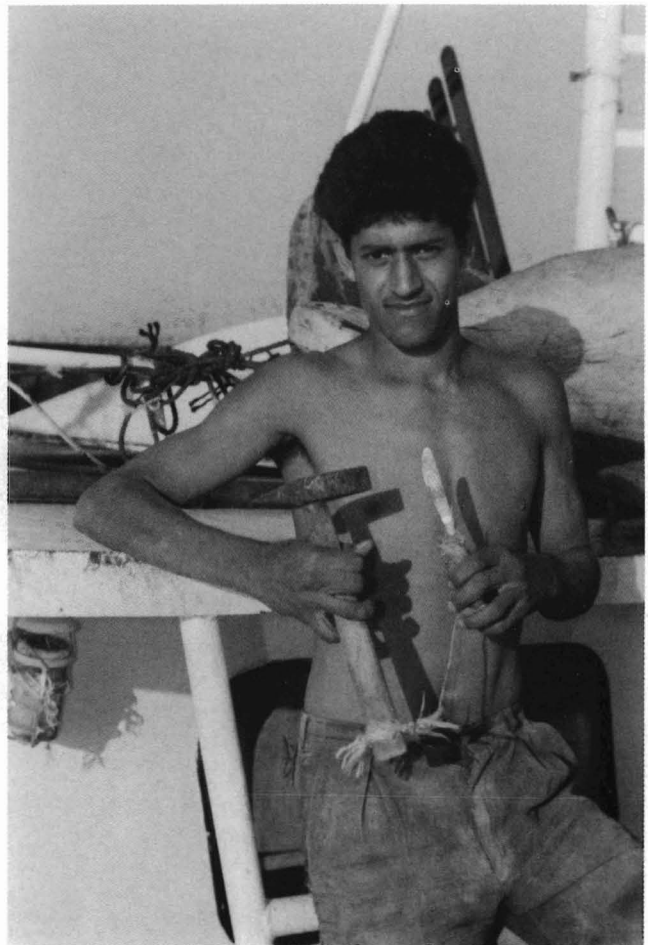


Figure 11.—Diver with hammer used to chop hole in second whorl of queen conch and knife used to cut muscle attachment from shell.

again. In addition, four divers died from causes “related to diving” (Martinez¹¹).

To improve working conditions, the divers have organized themselves into a formal group called HOMIBAT (Organizacion De Buzos Indigenas Miskitos De Honduras, or organization of indigenous divers in Honduras). HOMIBAT is comprised of nine regions in Belize, Honduras, and Nicaragua, each with a president, and with headquarters in Puerto Lempira. It does not seek government help; rather, it saves money and tries to be self-sufficient in achieving its goals (Martinez¹¹).

The goals of HOMIBAT are to lower the accident rate by improving training and capabilities of divers and captains and equipment, food, other living conditions on vessels, and medical treat-

ment. Since 1994, it has 1) brought about an end to diving beyond 37 m, 2) convinced vessel owners to see that divers with bends are taken to the decompression chamber in Roatan as quickly as possible (within 24 hours; in the 1980's, they were often taken there some three days after they got the bends, and some were permanently injured), and 3) convinced vessel owners to provide the divers with tank air pressure and depth gauges (in 1995, 95% of boats had them). In 1995, HOMIBAT was able to hire an instructor to train divers in 1-week classroom sessions about safety; the accident rate has since been lower. In addition, HOMIBAT is trying to increase the incomes of divers by investigating possible markets for sea cucumbers, sea urchins, and starfish,

which the divers often see in abundance while they are searching for lobsters and conchs (Fermin⁹, Martinez¹¹).

In 1996, there were 30 handicapped divers, 18–50 years old, in the Miskitia. In March 1996, HOMIBAT constructed a building in which ten injured divers at a time will live and construct lobster traps to sell to fishermen. After a period of months, they will be replaced by another group of injured divers. The money generated will be given to the men and their families for support (Fermin⁹, Martinez¹¹).

Industrial Trapping of Lobsters

An estimated fleet of 140 vessels, 23–27.5 m long, with crews of 10–12 men, sets traps for lobsters on the northwestern shelf of Honduras and northeastern Nicaragua. The vessels obtain licenses from Nicaragua to trap in its waters; few or no Nicaraguan vessels trap lobsters. The Honduran trapping grounds, depths from 15 to 37 m, are where diving for lobsters also takes place. Each vessel works 1,500–2,000 traps on lines of 25 traps each. The traps are baited with cowhide. Using hydraulic haulers, the vessels lift about 500 traps/day during a 7-day week (Rukin¹⁴).

Each lobster vessel remains on the grounds for 3–4 months at a time, freezing lobster tails in plastic bags as they are caught. Boats from Roatan go out to the vessels regularly to furnish replacement traps that are continuously being made as well as new bait and bring in the lobster tails. A typical vessel catches about 20,000 pounds of lobster tails during the 8-month season, perhaps an average of 100 pounds/day (Rukin¹⁴).

The lobster trap vessels land substantially more lobsters than the lobster diving vessels. No formal records are available, however, for separate catches of the two types of fishing (Rukin¹⁴).

Fishing for Blue Crabs

Blue crabs, “jaibas azules” in Spanish, live along the entire northern coast and in various lagoons and river mouths,

¹⁴James Rukin, president, fishermen’s cooperative, Oak Ridge, Roatan Island.

but not in large numbers. The following species of *Callinectes* occur along the Caribbean coast of Honduras: *sapidus*, *bocourti*, *danae*, *exasperatus*, and *larvatus* (Fischer, 1978). Small commercial fisheries for them exist between Puerto Cortes and Trujillo (Laguna de Guaimorte), but not farther east because no sale exists for them there. They are caught with lift traps (jaiberas), used mostly in depths of 2.4–4.6 m. The traps are baited with fish heads and are individually buoyed (Fig. 12). Fishermen lift one after the other to the surface, shaking out any crabs that have entered them, and dropping them again. Perhaps 20 fishermen, each using 5–30 traps, fish for the crabs along the entire coast and sell them locally. Salable crabs are 9–15 cm wide; 2 or 3 and sometimes 4 make a pound (Morales¹⁵). In March 1996, packages of 6 crabs sold for US\$1.77 in a supermarket in San Pedro Sula.

Few people go after blue crabs eastward of Trujillo. In Laguna de Brus, they get into fishing nets, but fishermen usually toss them back or take a few home to eat. They also catch blue crabs with spears or harpoons (Colindres¹⁶).

A Japanese firm has constructed a crab picking factory in Caukira on La-

¹⁵Luis Morales, Honduras Oficina de La Pesca, Tegucigalpa.

¹⁶Cecilio Colindres, artisanal fisherman, Laguna de Brus.

guna de Caratasca and in Trujillo, but the Honduras government has been reluctant to give it a permit to catch crabs out of fear that aggressive harvesting will deplete seriously the crab numbers. The company proposes to use Virginia (Chesapeake Bay) style crab traps. They have been tested here with some success (Fermin⁹).

Fishing for Shrimp

Artisanal

The only substantial fishery for shrimp in lagoons was in Laguna de Brus, where fishermen caught white shrimp, *P. schmitti*, with cast nets (Fig. 13). It lasted from early April through June and, if rains were light, sometimes into July. Otherwise, the salinity fell too low and the shrimp left the lagoon. Buy boats, one to four at a time, came into the lagoon to purchase shrimp. When they did, from 200 to 300 men and boys in dugout canoes went after the shrimp with the nets. The water usually was about 0.75 m deep and muddy. Fishermen located concentrations of shrimp by observing them jumping out of water. In 4–5 hours of fishing/day, each got 10–50 pounds of shrimp (weighed without heads). The buy boats sent speed boats around to purchase shrimp from the fishermen after the heads had been removed (Colindres¹⁶).

In 1995, the fishermen were paid US\$0.67/pound for shrimp. The buy

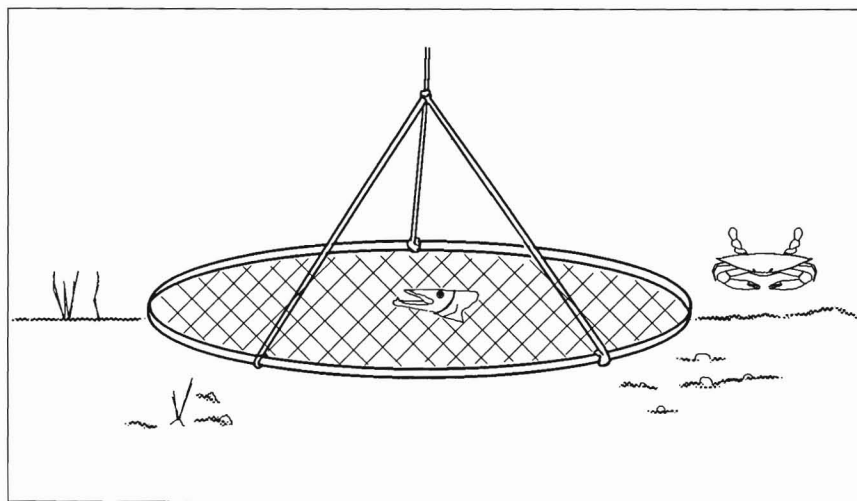


Figure 12.—Lift trap used to catch blue crabs.



Figure 13.—Demonstration of cast netting for white shrimp in Laguna de Brus.

boats put them into a cooler, and, after a few days, had a full load which they took to La Ceiba where they were packed for shipment to the United States. The Honduran government banned this spring fishery for shrimp in the Miskitia in December 1995. Besides fishing for shrimp, Laguna de Brus fishermen also went after fish and iguanas (Colindres¹⁶).

In Laguna de Los Micos, about 10 people seek brown shrimp (unspecified species) with cast nets. The shrimp are sold in nearby Tela (Aguilar¹⁷). Only minor cast netting for shrimp takes place in other lagoons along the coast (personal commun.).

Industrial

A large fishery for shrimp, mainly pink shrimp, *Penaeus notialis*, exists off the north coast of Honduras, between Cabo Camaron and Cabo de Gracias a

Dios, mostly at depths from 18–30 m (Table 1). The shrimp are taken with trawl nets towed at night; the minimum mesh size allowed by law is 3 cm. Some white shrimp are also taken by day by the same boats in shallower waters. The shrimp vessels, based mainly in Roatan, Guanaja, La Ceiba, and one or two other ports, are 21–27 m long and have steel or fiberglass hulls. The two trawl nets they tow have two doors and tickler chains, and, as mandated by the U.S. government, turtle excluder devices (McNab¹⁸).

The vessels usually make three tows/night, but lift “try nets” regularly to estimate the catch in the large nets. During the main part of the season, vessels can catch as many as 200 pounds of shrimp/lift. At season’s end, 10 pounds/lift is common (McNab¹⁸).

The shrimp boats freeze their catches and remain at sea for several weeks at a

time. Boats from packing houses in Roatan periodically go out to the boats to bring in frozen shrimp. They also keep the best finfish and sell them (McNab¹⁸).

A hazard for the shrimp trawlers are fossil oyster shells located in 18–30 m of water off the Miskitia area (long. 84°–83°W). The trawl nets are torn when they are towed over the shells (Chirinos¹⁹).

Shrimp Farming

Shrimp farming has boomed around the Gulf of Fonseca in southern Honduras. In 1995, there were 35 medium and large shrimp farms, 15 small projects, and 15 cooperative shrimp farms. The total area devoted to shrimp farming was 11,844 ha, and 5,259 people were engaged on the shrimp farms (ANDAH: National Aquaculture Association of Honduras). Honduran

¹⁷Victor Agilar, part-time artisanal fisherman, San Juan.

¹⁸Evans McNab, fishing boat owner, Roatan Island.

¹⁹Miguel Chirinos, captain, dive vessel *Harmac III*, La Ceiba.



Figure 14.—Children harvesting coquina clams at beach in Corozal.

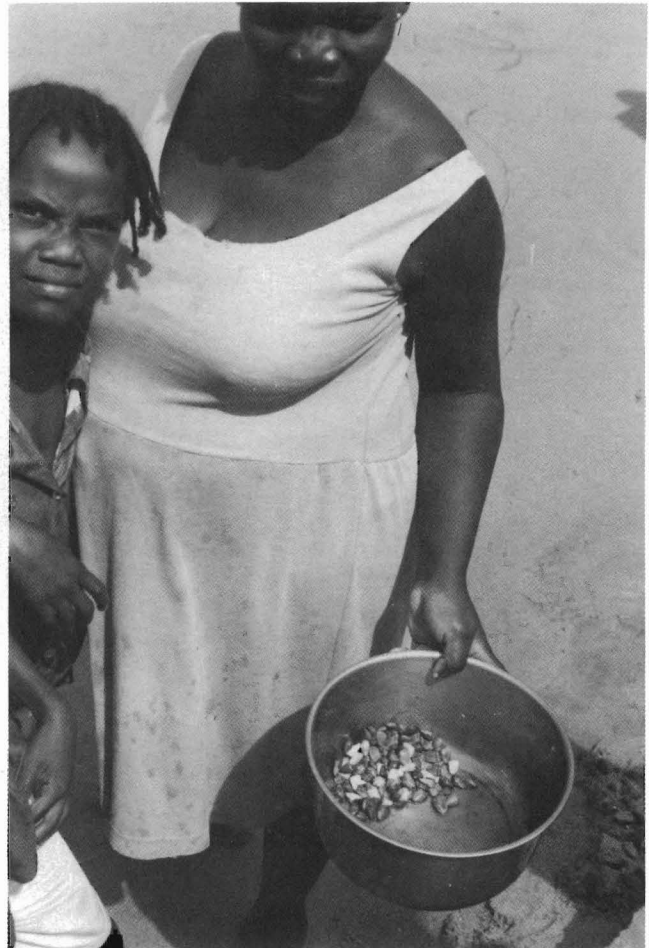


Figure 15.—Partial collection of coquina clams from beach in Corozal.

production of farm-raised shrimp was 3.3 times larger than its production of wild-caught shrimp (Table 1). There are no shrimp farms on the north coast of Honduras (Morales¹⁵).

Fishing for Coquina Clams

Coquina clams, *Donax denticulatus*, called *almejas* (Spanish) or *ahis* (Miskito) locally, are numerous in the surf zone along Caribbean beaches of Honduras. Edible-sized clams, 20–25 mm long, are most abundant in the spring and summer. Local women and children in villages near the shore harvest them once in a while (Fig. 14, 15) to eat at home, usually in soups with rice and coconut milk; alternatively they may be fried with onions. They are never sold in markets (personal commun.).

Fishing for Marshclams

Marshclams, *Polymesoda placans*, mostly called *curils* (Spanish) or *klihto* (Miskito) locally, occur in lagoons

along the north coast of Honduras, including Laguna de Alvarado, Laguna de los Micos, Laguna de Guaimorte, Laguna de Brus, and Laguna de Caratasca (Aguilar¹⁷, Fermin⁹, Luque²⁰). People harvest them on only a small scale, even where they are abundant. Most harvesting takes place in Laguna de los Micos where about three people fish for them every day. Using their hands to gather them from the sand substratum in water 30–75 cm deep, each harvests as many as 1,000 marshclams in 5 hours. They are sold locally with the remainder for sale during holidays to restaurants in Tela, where they are served in

soups or salads mostly during festivals (Aguilar¹⁷)(Fig. 16). Some marshclams are also used as bait for fish. Marshclams apparently were harvested more extensively in earlier periods.

Oysters

Few oysters, *Crassostrea rhizophorae*, occur along the north coast of Honduras. Some grow in Laguna de Guaimorte and along the north shore of Laguna de Brus on mangrove roots. People seek them only occasionally (personal commun.). Oysters are scarce or absent in Laguna de Caratasca, undoubtedly because the salinity is too low. Nueva Armenia fishermen reported they eat crown conchs, *Melongena melongena*, when they find them.

²⁰Jose Luque, hotel owner, Puerto Cortes.

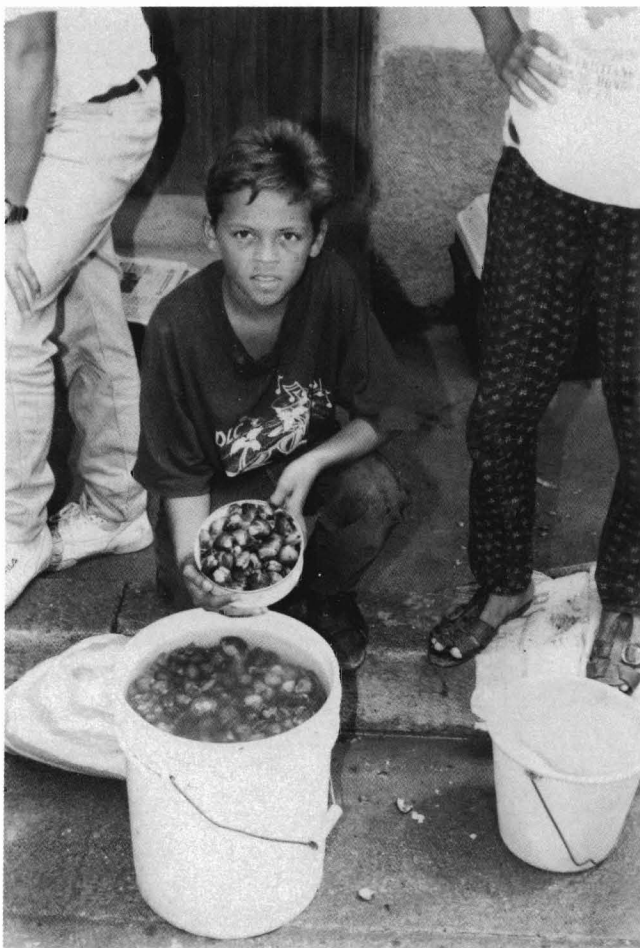


Figure 16.—Peddling marshclams in public market in Tela.

Mollusks in the Gulf of Fonseca

Some mollusks are taken in the Gulf of Fonseca in southern Honduras (Fig. 1). Most are black ark clams, *Anadara tuberculosa*, called “conchas negras” locally; giant ark clams, *A. grandis*, called “casco de burro” locally;

beanclams, *Donax dentifer*; and giant eastern Pacific conchs, *Strombus galeatus*. Details on the fisheries for them are unavailable (Portillo²¹).

²¹ Milton Portillo, biologist, Oficina de la Pesca, Direccion Regional de Recursos Naturales, San Pedro Sula.

Conclusions

The aquatic habitat in Laguna de Caratasca, Honduras' largest lagoon, is poor for crustaceans and mollusks because the salinity is too low. If the salinity were raised permanently, perhaps above 10‰, larger numbers of white shrimp and oysters, and more marshclams would inhabit the bay. This could be accomplished by making another wide breach in the barrier beach. Marshclams are abundant in various lagoons. Perhaps a larger market could be found for them. Studies need to be made of the abundance, size structure, and productivity of blue crabs so that they can be harvested on a larger scale.

Acknowledgments

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