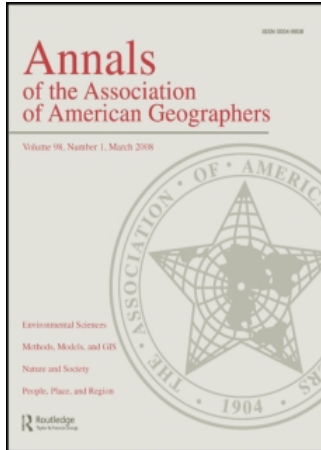


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THE GROUPER FISHERY OF CAY GLORY, BRITISH HONDURAS¹

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ABSTRACT. Fisheries are poorly developed throughout the western Caribbean. An exception is British Honduras where there is a substantial folk-fishery and the daily consumption of fresh fish is customary by the urban population. There are three ethnic groups of fishermen, with Mestizos from the northern cays providing leadership in the annual exploitation of an unusual concentration of grouper in the Cay Glory area. Timing of the occurrence allows surplus salt-cured fish to be sold to inland communities and exported at premium prices to satisfy Lenten demand. Numerous adaptations to tropical climatic conditions have evolved in preservation techniques but the industry as a whole may soon decline owing to overfishing if uncontrolled exploitation continues.

BRITISH Honduras is a country where geography has conspired to make existence difficult. It is a land isolated from its neighbors by swamps, dense forests, mountains, and rugged karst topography. In the past it has suffered from recurring natural disasters ranging from hurricanes to fire, flood, and drought. As a newly emerging nation it is scheduled to gain independence in the near future and will face a discouraging array of chronic problems, not the least of which is how to feed itself. Like many other nations, British Honduras must ultimately turn to the sea where one answer lies in increasing the production and consumption of fish.

In spite of this need, there is a general lack of interest in the harvest of marine resources that is typical of the entire western Caribbean. Surprising as it may seem, very few nationally owned commercial fisheries have been developed along some two thousand miles of coastline between Cape Catoche in Yucatan and the shores of Panama. With the exception of a spiny lobster fishery in British Honduras, exploitation is largely restricted to shrimp trawlers that work in coastal waters off Honduras and Nicaragua.² Of fifty-four shrimp

boats operating out of the Bay Islands (Honduras) in 1965, only nine were owned locally, the balance being of United States registry.

The only substantial attempt to catch scale fish on a commercial basis for export occurs in British Honduras. For a few weeks each year local fishermen establish themselves in temporary camps near the Cay Glory shoals to catch grouper (sea bass, *Epinephelus* spp.) that abruptly appear in great numbers in front of the barrier reef (Fig. 1). This massing of grouper takes place in thirty fathoms of water over a predominately sandy bottom swept by relatively strong currents. It is particularly fortunate that these circumstances occur shortly before the beginning of the Lenten season since dietary customs subsequently generate a strong market for dried fish in the adjacent interior population centers of Central America.

Although the annual events at Cay Glory are unique and cannot be considered typical for this part of the Caribbean, they are of considerable cultural interest in that the happenings demonstrate the existence of a well organized base for expansion of an effective folk-fishing industry. Some additional consideration of this grouper fishery is justified in that it represents the most important opportunity for British Honduras to establish a quality export market in the neighboring Central American countries. To the fisher-

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¹ Research connected with this study was performed in 1964-65 for the Coastal Studies Institute at Louisiana State University from funds provided by the Geography Branch of the Office of Naval Research under Project Nonr 1575(03).

² For details of the spiny lobster fishery see A. K. Craig, *Geography of Fishing in British Honduras and Adjacent Coastal Areas* (Baton Rouge: Louisiana

State University Press, Coastal Studies Series No. 14, 1966).

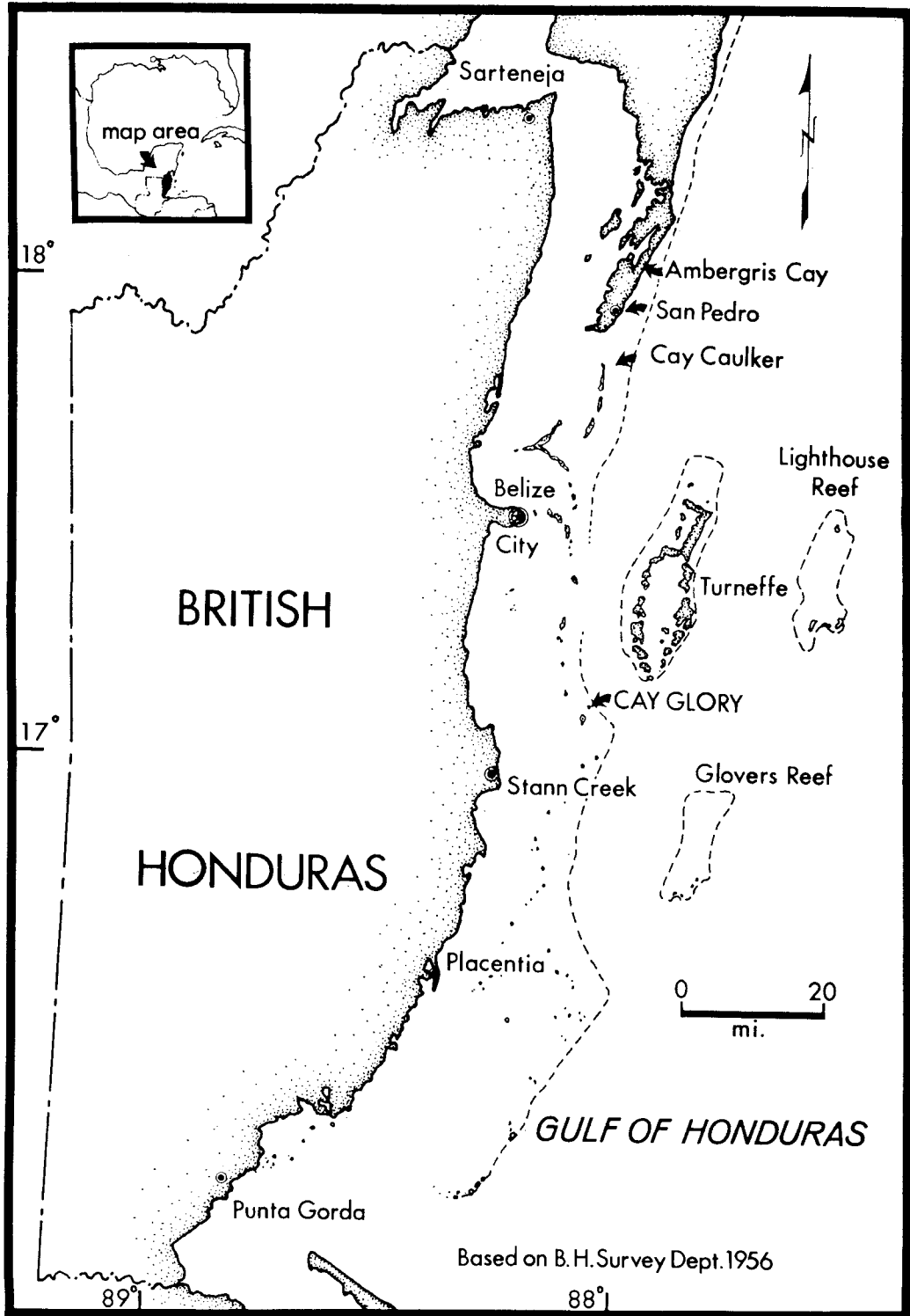


FIG. 1. British Honduras location map.



FIG. 2. Fishing fleet at the mouth of Haulover Creek, Belize City. Municipal fish market is shown at extreme right.

man of limited circumstances it is an annual chance to "strike it rich" since his share of a good catch may amount to more than he would normally earn in six months of routine work.

THE FISHING ECONOMY

From a population now estimated in excess of 100,000, less than one percent are fishermen who make any substantial contribution to annual catch production. In this basically agricultural country of subsistence farmers there are probably no more than six hundred full-time, professional fishermen and of these, fully four hundred are located in the northern villages of Cay Caulker and San Pedro on Ambergris Cay (Fig. 1). Another three hundred can be classified as farmer-fishermen who augment their normal farming activities with occasional income derived from fishing, especially during the four to five weeks each year when grouper appear at Cay Glory.

Export figures do not reflect the importance

of fish to the national economy. Official records indicate that maritime products of all descriptions usually constitute less than two percent of the Gross National Product. However, in a population that has long suffered from malnutrition, the animal protein provided by locally caught fish is an important dietary item. This is particularly true in the capital of Belize City where many of the 40,000 inhabitants are dependent upon a daily ration of fish which they buy at the government-controlled price of seventeen cents per pound.

The fishing fleet consists of approximately five hundred boats of all sizes distributed along the coast with concentrations at Punta Gorda, Placentia, Stann Creek, Belize City, Sarteneja, and the Cay Caulker-Ambergris Cay area. The importance of the Cay Glory fishery can be judged from the fact that in recent years as many as three hundred boats have appeared during the grouper run. Before overfishing began a decade ago, it was not



FIG. 3. Pre-hurricane "Hattie" view of the fishing village of San Pedro on Ambergris Cay.

uncommon for an experienced crew of three men to catch and salt between one hundred and one hundred fifty dozen fish. The total catch from all boats has never been accurately determined, but an estimate of one hundred short tons is probably realistic, since many crews fail to catch more than a few dozen fish.

DEVELOPMENT OF THE INDUSTRY

Even though there are sufficient marine resources to justify limited exploitation at almost any point along the coast of British Honduras, fishermen are unevenly distributed. Least significant are the small groups of Black Carib fishermen based in Punta Gorda, Placentia, and Stann Creek, with the largest number (ca. fifty) to be found in the last named town.³ Belize City is by far the largest consumer retail market and a rather motley

³ A definitive account of these people has been prepared by D. M. Taylor, *The Black Carib of British Honduras* (New York: Wenner-Gren Foundation for Anthropological Research, Viking Fund Publications in Anthropology, No. 17, 1951).

Creole fishing fleet is based here. The boats anchor in the shallow estuarine mouth of Haulover Creek where fish can be offloaded alive from the inboard bulkhead wells directly onto the concrete tables of the municipal market place shown at the extreme right of Figure 2. Daily catch statistics vary with seasons but on a yearly basis appear to average about two tons per day, which does not suffice to satisfy market demand at Belize City. These primitive but effective municipal facilities are also utilized by the highly successful fishermen who live in the prosperous communities of San Pedro, on Ambergris Cay, and Cay Caulker (Fig. 3).

It is no longer possible to determine accurately which ethnic group was responsible for the discovery of the Cay Glory grouper run; it is equally difficult to pinpoint the beginning year of what has since become an annual gathering of hundreds of fishing boats. However, from an analysis of what is known of fish boat development in British Honduras

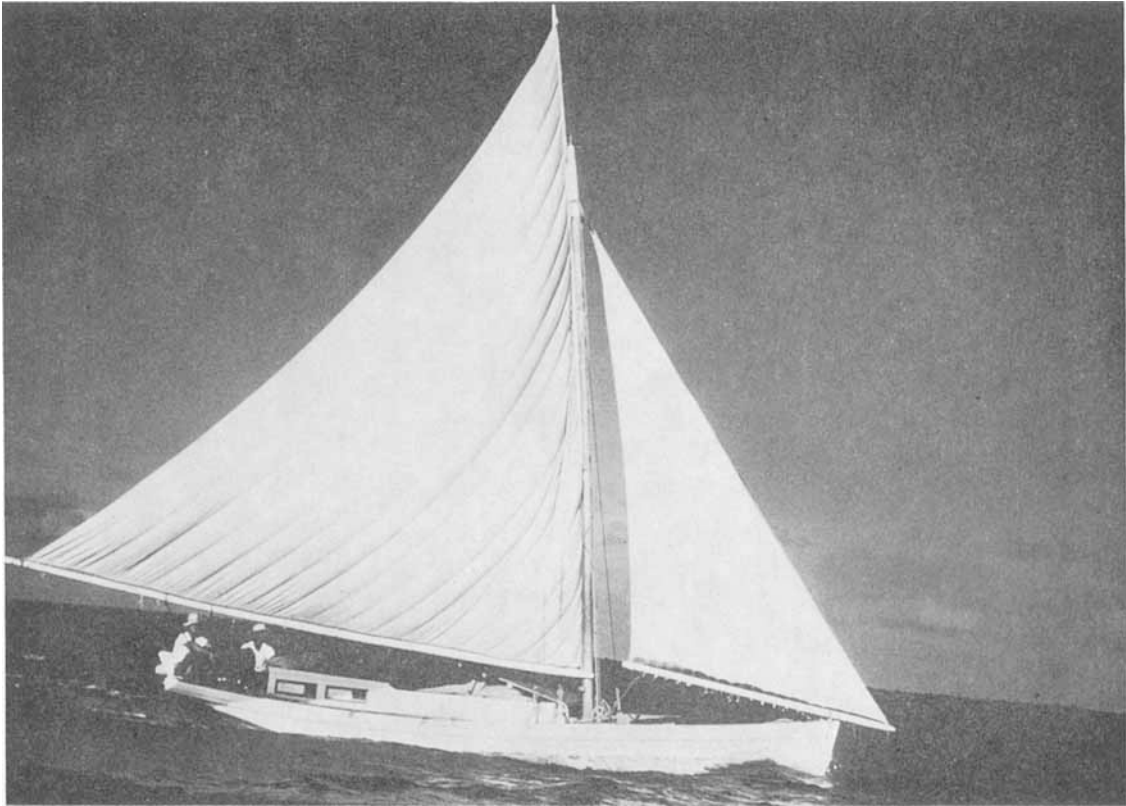


FIG. 4. The Belizean smack "Jessie B" bound for Cay Glory.

we can arrive at a fairly close approximation. Sturdy sailing craft of Belizean "smack" design (Fig. 4) were not available until after 1911 when this small, double-ended, water ballasted, sliding-Gunther rigged sloop was introduced from Cuba.⁴ Since a substantial boat is necessary for the Cay Glory trip, we may tentatively assign beginnings of the grouper fishery to the middle or late 1920's. Indeed, this is the same period suggested by estimates of the "old heads" among the present population of Cay Caulker village who recall that their fathers were engaged in the annual trip at about this time.

⁴ Many of the important items of material culture associated with folk fishing in British Honduras have been dispersed from Cuba, which continues to serve as a hearth area for the diffusion of new fishing techniques in the Caribbean. An insight into the sophistication of their fisheries can be gained from the excellent publication of M. Sanchez-Roig and F. Gomez de la Maza, *La Pesca en Cuba* (La Habana: Ministerio de Agricultura, 1952).

ORGANIZATION AND EQUIPMENT

Mestizo fishermen from the two northern villages of Cay Caulker and San Pedro are the principal participants in the Cay Glory grouper fishery and are generally acknowledged to be the most skillful fishermen in British Honduras. This is owing in large part to the fact that they are better equipped in almost every respect than their Creole and Black Carib neighbors to the south. This relative wealth of equipment—particularly in the form of well-built sailing smacks—may be valued at several thousand dollars and is acquired as a result of success of trap fishermen in the exploitation of spiny lobster (*Panulirus argus*). Much of the profit gained from the highly lucrative lobster fishery is invested in constant maintenance of boats, construction of additional lobster traps, purchase of gear, outboard motors, and other relatively modern equipment.⁵

⁵ This strict attention to the care of boats and equipment is not typical of fishermen in other parts



FIG. 5. Fish-drying racks (*tendedores*) and "trash" hut at Cay Glory.

Substantial expenses are incurred by fishermen who participate in the three to four weeks of intensive activity at Cay Glory. In recent years the cost of food, preservative salt, and other essentials, has risen to the point where it is no longer feasible for most individuals to attempt the trip alone. In addition, the requirements of actual fishing, processing, and preservation of the catch are such that team effort is the only practical solution. Such cooperation is basically contrary to the normal, highly individualistic behavior of these fishermen. However, under the circumstances, small groups of four or five men (usually close neighbors from the same village) will temporarily join forces and divide profits after an extra share has been allocated to the boat owner.

These casual alliances usually have been formed by late December when most boats

of the western Caribbean. It is probably in part a response to the presence of *broma* (shipworm) which infests these waters.

leave the northern cays for Cay Glory. Departure date is calculated on the basis of observed changes in the lunar cycle which the fishermen believe controls the appearance of the fish some two weeks later in early January.

The fishing partners pool their funds so that sufficient staple food can be purchased to last about four weeks. Even more important are the large burlap bags of coarse "Liverpool" salt that are loaded in Belize where merchants have stockpiled quantities in anticipation of the yearly demand. This salt is produced in the nearby Turks and Caicos Islands (Bahamas—under Jamaican administration), shipped to Great Britain where it is bagged, and then returned to the Caribbean whence it came.

In addition to the foregoing, at least one large steel drum of fifty-two gallon capacity is carried on board each boat and filled with fresh water to accommodate the needs of the crew. Unfortunately, the only sound drums available for this purpose are those that have



FIG. 6. Fish corrals or holding pens built from mangrove stakes. Thatch huts erected on pilings are located in shoal water in the background.

recently contained gasoline, oil, or some other petroleum product, traces of which usually remain behind to add to the general discomfort of these arduous fishing trips.

More efficient crews make plans to arrive at the fishing grounds at least a week in advance of the date in early January when they calculate the fish will appear, as there are a number of preparatory chores to be performed before actual fishing begins. For example, if the fishermen do not elect to sleep on board the crowded boat, then they must build or refurbish a "trash" hut (Fig. 5, extreme left). In anticipation of this requirement, many boats carry considerable quantities of palm-frond thatching to the Cay Glory shoals. These thatch-roofed huts provide nothing more than crude shelter and a sleeping platform built on stilts over the extremely shallow water.⁶ In spite of the fact

⁶ Cay Glory was for many years a legitimate island of sand and coral shingle; it appears to have been

that there is no longer any dry land at the Cay Glory location, these huts soon become thoroughly infested with fleas.

Considerable amounts of mangrove branches and miscellaneous saplings are needed as components of the fish holding pens (Fig. 6), cleaning tables (Fig. 7) and the rather elaborate, three-tiered drying racks called *tendedores* (Fig. 5). As a consequence of these diverse requirements, considerable time and effort is expended in the collection of materials. After weeks of preparation the boats set sail from the northern cays burdened with maximum hold and deck cargo.

partially destroyed in the hurricane of 1931, and was completely obliterated in the famous hurricane of 1961 which left nothing more than an extensive, shallow, sandy shoal where the island had previously been. Dynamics of storm change in this area have been discussed in the monograph by D. R. Stoddart, "Effects of Hurricane Hattie on British Honduras Reefs and Cays, October 30-31," *Atoll Research Bulletin No. 95* (Washington, D. C. (1963)).



FIG. 7. Cleaning and salting grouper at Cay Glory.

FISHING TECHNIQUES

With a base of operations firmly established and in good working order, the crews are ready to begin fishing as soon as the grouper arrive. Fishing is normally done from small, canoe-like, dugout dories using stout linen handlines (Fig. 8). Terminal gear usually consists of a brass swivel, heavy nylon monofilament leader, and a pair of dropper-rigged hooks above a one pound assortment of nuts, bolts, or other scrap-iron oddments that serve as a weight. Toward the latter phases of the run the fish may become "tricky" (*i.e.*, refuse to bite) whereupon the linen handlines are replaced entirely with monofilament even though it is more dangerous to handle because of its tendency to cut the hands.

Since the fishing grounds are distributed along a narrow sector in front of the barrier reef in an exposed position, anchoring the small dugout fishing dories in thirty fathoms of water becomes a problem. In some instances it is feasible to anchor the larger

smacks in front of the reef with sufficient rode to prevent dragging. However, this is considered a risky procedure—if a sudden squall appears the smacks must beat back to the lee of Cay Glory through several narrow and dangerous channels in the reef.

When larger boats are anchored in front of the reef, an interesting symbiotic relationship may occur between the northern Mestizo crew and Black Caribs from Stann Creek who operate small sailing dories. In exchange for permission to tie on to the larger boats (and thereby gain a fixed position over the fishing grounds), the Carib fisherman agree to replenish water or food supplies on their daily return trips to Stann Creek, thus allowing the crew of the larger boat to continue fishing activities uninterrupted by a resupply trip.

A typical day during the Cay Glory grouper run begins with a simple pre-dawn breakfast. It is followed by a short trip through the barrier reef in a dory, towing a small "fish-car" of bait fish caught the previous day by

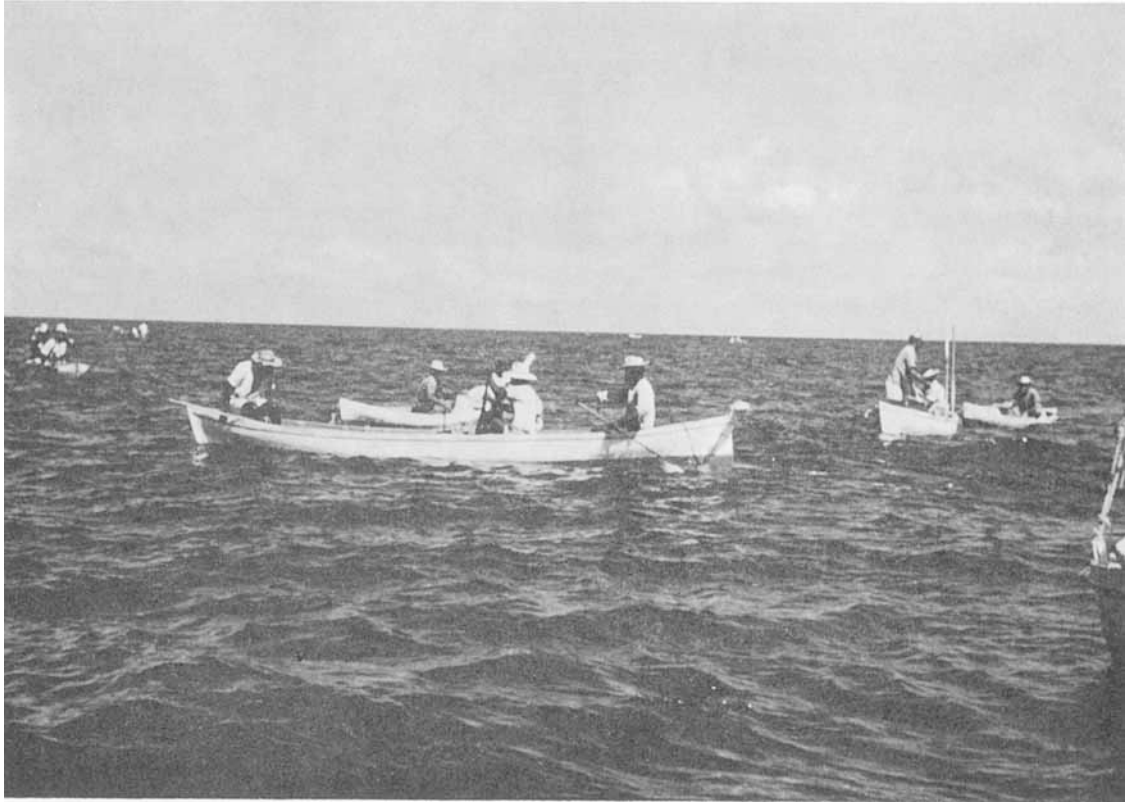


FIG. 8. Handlining for grouper from dugout canoes off Cay Glory.

the cook who customarily remains behind to tend camp. Small water glasses are often used to aid in locating favorable bottom on the fishing grounds, although on a particularly still day the fish themselves can be seen moving slowly over the sandy portions of the forereef area. Each fisherman works a single line and hauls the relatively small grouper to the surface as fast as possible.⁷ An ice pick is kept handy in order to "wind" the fish; "winding" involves puncturing the swim bladder which has become distended owing to sudden pressure change so that it often protrudes out of the mouth.

Freshly caught fish are placed on long cord stringers where they hang near the surface alongside the dugouts. Attacks by sharks are uncommon even though on a busy day as many as two hundred fish will be displayed in this manner. These stringers impede progress during the return journey to base camp but are necessary in order to deliver the fish

alive into the "corrals" or holding pens where they are accumulated prior to processing.

PROCESSING TECHNIQUES

Actual fishing operations at Cay Glory are usually terminated about midday when the fishermen return to camp for "tea" (lunch) and a brief siesta. In the afternoon, all hands are busy butchering and preserving fish, using a salt-and-sun-drying method locally known as the "Cay Glory dry-corned" process.

Although inhabitants of fishing villages in British Honduras do not exhibit any extraordinary concern with aspects of sanitation and hygiene beyond the norms expected in this part of the western Caribbean, it is remarkable that physical circumstances surrounding fish processing at Cay Glory are such that it is a relatively sanitary procedure. In view of the widespread lack of refrigeration facilities it would be difficult or impossible for this tropical fishery to exist on a profitable basis if preservation techniques were less effective in combating spoilage.

⁷ Average size is approximately five pounds.

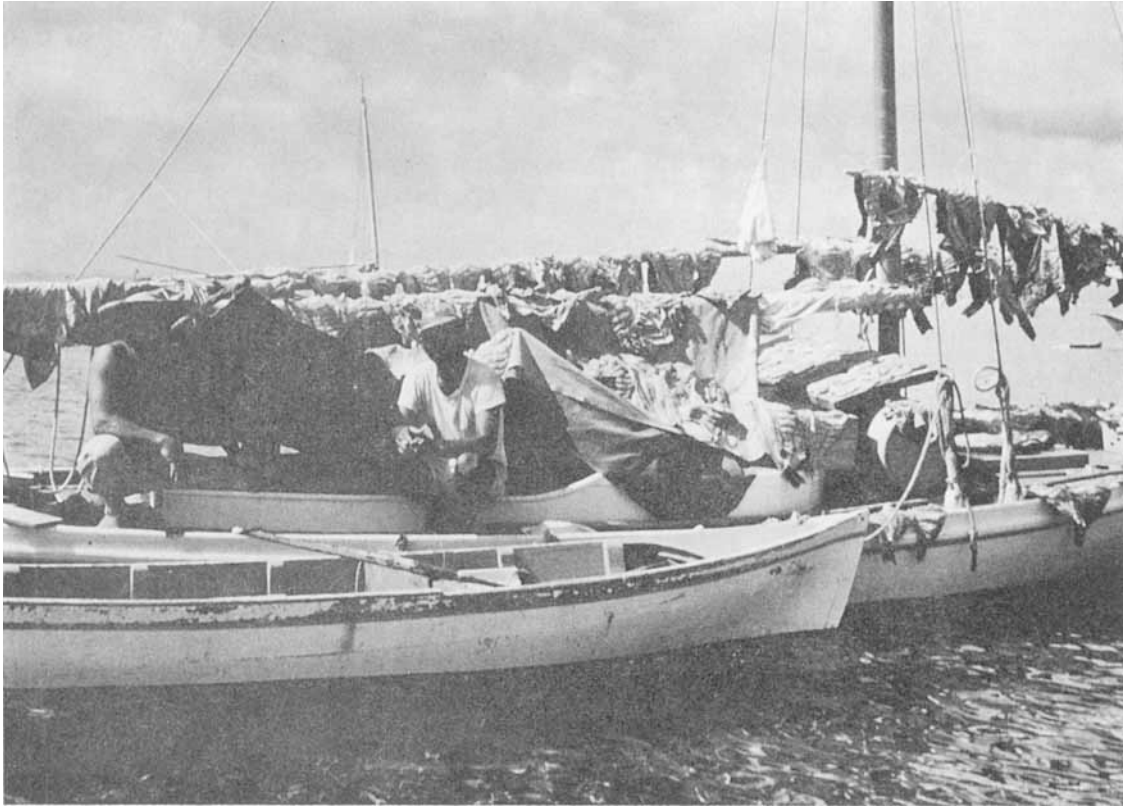


FIG. 9. A Cay Caulker smack anchored at Cay Glory. Note fish drying on spars and deck, and roe on the hatch cover aft of mast.

At the beginning of each day's processing, the dead or dying grouper are the first to be removed from the corral. They are collected and hauled a short distance to the cleaning tables where processing is begun. The gutted carcass is beheaded, split down the middle, and the backbone removed. Offal from these operations is simply dumped to one side of the tables where it accumulates in the ankle-deep water. Sooner or later this material attracts a variety of scavengers including small sharks that occasionally venture so near the tables that they are killed with machetes. The sharks are then dry-corned along with the grouper.

When the foregoing operations are complete the fillets are ready for scoring and the application of preservative salt. Some six to ten deep incisions are made in each fillet depending upon its size. Into these cuts a liberal quantity of coarse salt is packed so that little, if any, of the flesh is left completely

unprotected. It is in this application of salt that the fishermen sometimes effect economies, but with disastrous results if the amount applied is too meager and the catch spoils. Experience is the only basis for judgment in this matter; the unnecessary wasting of expensive salt is considered a sign of incompetence and the mark of an amateur.

Dry-curing is the final step in the processing method. Salted slabs of fish are spread out to dry in the sun in order to remove as much moisture as possible. A minimum of three full days of sunshine is needed to reach the desired texture and a reasonable degree of protection from bacterial decay. After a good catch has been processed, every bit of available space on board the boats is covered with drying slabs of fish. Figure 9 is a view of a Cay Caulker smack "on station" during the height of the grouper run when fish fillets can be seen festooning the boom, spars, hatches, and deck.

In the month of January it is not at all uncommon for British Honduras to be visited by sudden storms ("northers") that sweep down as cold fronts through the Mississippi Valley, travel across the Gulf of Mexico, and into the western Caribbean where their arrival wreaks havoc with the affairs of fishermen, especially those who may be at Cay Glory. Since there is no adequate means of disseminating weather warnings in this area, sudden winds and rain squalls that always accompany the passage of these fronts can destroy in a matter of minutes the result of much labor. It is the additional responsibility of the crewmember who remains in camp to guard against this possibility. He must be constantly alert for weather signs and be prepared to move the catch under cover at a moments notice.

Rather than risk an unexpected wetting (or loss to other crews through mistaken ownership) the sun-cured fish are removed from the racks and gathered together in bales immediately upon completion of the drying period. These bales are then securely stored below decks in the smacks. This completes the fishing cycle at Cay Glory — but the work goes on until catch returns on the fishing grounds dwindle to the point where the results are deemed insufficient to justify remaining.

The campsites with their temporary structures are abandoned in a matter of an hour or so, leaving behind nothing more than a spindly collection of mangrove saplings to mark the site. Unaccustomed to long absences from home, the fishermen are eager to return to their villages where arrangements must soon be made for the cooperative marketing of their catch.

MARKETING METHODS

British Honduras fishermen are not experienced in the intricacies of cooperative marketing on a local basis, much less on an international scale. Their experience in the past has been restricted to retailing of their catch piecemeal to customers at the Belize City fish market. In recent years additional opportunities have existed in that the fishermen could also sell wholesale at fixed prices to a fisherman's cooperative, providing they were members.

However, for the disposal of fish in the quantities caught at Cay Glory, special arrangements have become mandatory. This is a result of sharply increased production occasioned by the presence at Cay Glory of many part-time fishermen from distant coastal villages such as Punta Gorda and Sarteneja. They are opportunists who hope to reap a quick profit of several hundred dollars before returning to their normal farming activities. In recent years they have converged on Cay Glory to the point where it is estimated that more than three hundred boats are present. As a consequence, the supply of dry-corned grouper for the Lenten season now far exceeds the local Belizean market demand. Obviously a new market had to be developed.

This was accomplished in 1964 by sending a cooperative-owned, diesel powered utility launch down the coast to Puerto Barrios, Guatemala, with an initial load of about four tons of baled, dry-corned grouper belonging to various members of Northern Fishermen's Cooperative.

The trip was not altogether an unqualified success but it did establish the fact that there was considerable unfulfilled demand for fish in this part of Guatemala. Shortly after docking wholesale food dealers inspected the bales of dried fish and eventually bought the cargo at the relatively attractive price of forty cents per pound. Nevertheless, it remains to be seen whether this marketing system will prove to be satisfactory on a long-range basis. For example, a similar attempt in 1965 was considered a failure as the fishermen received a lower base price (*ca.* thirty-six cents/lb.) and were forced to pay substantial taxes or import duties imposed by port officials. For these reasons it was the consensus of Cooperative members that the selling trip was not worthwhile, although they were undecided as to an alternative means of disposing their catch.

It seems likely that the most practical solution to the marketing problem will evolve out of an increased selling effort in the interior towns of British Honduras by the Cooperative itself. In order to accomplish this task a dependable delivery system will be mandatory, with the entire operation conducted on an efficient basis. Some tentative efforts have been made in this direction by

using an insulated truck to transport frozen fish short distances from freezers in Belize City to outlying districts, but as in much of Latin America, lack of an adequate transportation network makes delivery to many areas unprofitable.

FUTURE DEVELOPMENTS

Exploitation of the Cay Glory grouper resource will continue to attract an ever-growing number of fishermen who are ignorant of fish population dynamics and who are inept at marketing. This intense fishing activity concentrated on a population confined to a relatively restricted area can only result in overfishing, if indeed this has not already taken place. In any event it is certain there will be deleterious effects if fishing is not maintained at an efficient level. The inevitable consequences of uncontrolled exploitation of natural resources in British Honduras makes a dismal, repetitious picture. Logwood, turtle, manatee, mahogany, cacao, sponge, chicle, pine, spiny lobster, and conch have all been subjected to indiscriminate harvesting to the point where they have failed

commercially or show evidence of alarming declines. We may safely predict the same fate for the grouper fishery at Cay Glory. If investigation suggests overfishing has occurred an effort should be made to survey the barrier reef to determine if there are other areas of similar fish concentration that will expand the fishing grounds and relieve fishing pressure at the same time.

Successful marketing is an equally important aspect of the grouper fishery. It is in this area that there is a real need for technical assistance and governmental support. Serious examination must be made of any future attempts to foster or enlarge international sale of dried fish while many inhabitants of British Honduras continue to exist on a severely restricted animal protein diet.

The problems that have been identified in this article describing a relatively primitive folk-fishery are typical of developments in many small, newly-emerging nations. It is representative of an elementary situation that needs to be most carefully considered by the appropriate government authorities responsible for the socioeconomic well-being of their people.