

**LAKE IZABAL FISHERIES SURVEY**

**INTERNATIONAL CENTER FOR AQUACULTURE  
DEPARTMENT OF FISHERIES AND ALLIED AQUACULTURES  
AGRICULTURAL EXPERIMENT STATION  
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**Project: AID/csd-2780**

**Date: September 5, 1973**

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by

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## 1.0 ITINERARY

- June 11, 1973** Arrived Guatemala City; met with U.S.A.I.D. officials, Agricultural Sector.
- June 12** Conferences with officials at U.S.A.I.D. and the Division of Natural Renewable Resources, Directory of Fauna, Ministry of Agriculture.
- June 13** Traveled to Lake Izabal, Rio Dulce and El Golfete.
- June 14** Traveled to Livingston and Puerto Barrios. Returned to Guatemala City.
- June 15** Conferences with U.S.A.I.D. officials.
- June 16** Traveled to Atitlan; conferred with Peace Corps Volunteer and Graduate Research Assistant, Oklahoma State University Project.
- June 17** Returned to Guatemala City.
- June 18** Conference with Minister of Agriculture and Commander of the Navy.
- June 19** Traveled to San Felipe, Lake Izabal.
- June 20** Traveled to El Estor and Mariscos, Lake Izabal. Returned to Guatemala City.
- June 21** Conferences with U.S.A.I.D. officials.
- June 22** Departed Guatemala City.

## 2.0 INTRODUCTION

In response to a request by the Government of Guatemala and under the sponsorship of U.S.A.I.D., a pre-feasibility fishery survey was conducted from June 11 to the 22, 1973, on the Lake Izabal, Rio Dulce, El Golfete system. The objectives were to provide the Ministry of Agriculture with recommendations for developing a realistic program of stock assessment and management for the fishery resources.

The principal sources of information used in preparing this report were:

1. Published reports dealing with marketing of freshwater fish products in Guatemala and fishery surveys in the Rio Dulce and the Gulf of Honduras; unpublished reports dealing with recent limnological studies on Lake Izabal and the river system.
2. Interviews with fishermen and buyers during 4 days on Lake Izabal and the Rio Dulce River System.
3. Interviews with government officials engaged in fishery related services.

Significant contributions to the survey were made by several government agencies, but specifically the Directory of Fauna. In this respect, Lic. Carlos A. Silva C. III, Economist with the Department of Marine Fisheries was an extremely gracious and helpful host. The U.S.A.I.D. Mission provided logistic support.

## 2.1 Guatemalan Geography and Population<sup>1</sup>

Guatemala lies just south of Mexico in Central America. It is bounded on the south and southeast by El Salvador and Honduras, on the east by Belize and the Caribbean, and on the southwest by the Pacific. With a land area of 108,889 square kilometers, it is the third largest of the Central American Republics.

Guatemala has a diverse geography which includes the agriculturally rich coastal plains, the virtually uninhabited lowlands in the north and the high mountain regions in the center (Whetten, 1961).

The Pacific Coast region and that area bordering the Gulf of Honduras have relatively high temperatures in the range of 20 to 33 C (68 to 92 F) and a pronounced rainy season from May to October. The average monthly precipitation for the Pacific Coast is 559 mm during the rainy season, compared to only 87 mm for the other months. The Caribbean Coast has a less pronounced rainy season; average monthly precipitation ranges from 173 mm to 154 mm between the wet and dry season. Recent agricultural development has increased the production of such export items as cotton, bananas, beef and pork. As a result, an increasing number of people from less rapidly developing areas are migrating to these regions.

The Peten region or northern lowlands, makes up over a third of the land area of Guatemala, but contains only a fraction of its population. The area is relatively rich in river systems and contains several large lakes. Average monthly precipitation during May to October is 170 mm compared to 56 mm during the dry season. Lack of transportation facilities into and

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<sup>1</sup> For readers not familiar with Guatemala

within the region has hampered agricultural development. However, the government has been improving the road system in recent years.

The highlands region contains very little flat land suitable for mechanized agriculture; but it is the most densely populated area in the country. There is a wide range of climatic conditions in this region that allow for a variety of agricultural crops. Flowers, fruits, coffee, corn, beans and wheat are produced here. Often small plots are cultivated on slopes as great as 45 degrees; as a result, most of the rivers and streams in the region are heavily laden with silt during the wet season. Meteorological data for Guatemala City, located in this region, are as follows:

Ave. min. temperature	:	14.3 C (11.5 - 16.0 C)
Ave. max. temperature	:	24.1 C (21.9 - 26.6 C)
Ave. monthly precipitation		
Dry season	:	21.5 mm
Wet season	:	185.5 mm

The population of Guatemala in 1970 was 5.3 million, which when compared to the 1964 census of 4.3 million people, represents a 3.3 percent average annual rate of increase. About 2 million are classified as Indians, or those people who are descendants of precolonial inhabitants of the region who have not adopted Western culture. About 80 percent of the total population are rural; the majority have less than a 3rd grade education and farm small plots at a subsistence or near subsistence level.

## 2.2 Fish Marketing and Consumption

In 1971, the total catch of fish for Guatemala was approximately 5,000 metric tons. Of this total, 1,400 tons came from inland waters. The Pacific Coast marine fisheries yielded 3,500 tons while those fisheries in the Caribbean accounted for only 100 tons. The principal marine fishery is for shrimp

which is an important export item. Although some shrimp are sold to inland markets, the industry mainly supplies marine fish which are caught incidental to shrimp trawling operations. The 1971 catch represents a 284.6 percent increase over that reported in 1961 (FAO, 1971).

Per capita consumption of fish in Guatemala is only 0.4 kg annually or 10.1 grams per person per day as compared to 30 grams per person per day for other meat products. This value is one of the lowest fish consumption rates for any of the Central American Republics, and in fact the world.

The consumption rate may be influenced by the relatively high cost of fish when compared to other meat products. The following table illustrates meat prices in Guatemala City in June, 1973.

<u>Product</u>	<u>Range in price</u> (per pound or per number)
Whole Fish (Snook)	\$0.70 - \$0.95
Filet of Snook	\$1.25
Whole Guapote (10 cm)	\$0.20 - \$0.25
Rock Lobster	\$1.50 - \$1.85
Oysters	\$1.00/dozen
Crabs (Freshwater)	\$1.00/13 - 18
Catfish (Marine)	\$0.25
Largemouth Bass (25 cm)	\$0.40
Shrimp (large, frozen)	\$1.00 - \$1.15
Pork Leg	\$0.60 - \$0.70
Whole Chicken	\$0.40
Beef (Flank steak)	\$0.60 - \$0.70
Beef (T-bone steak)	\$0.90 - \$1.10

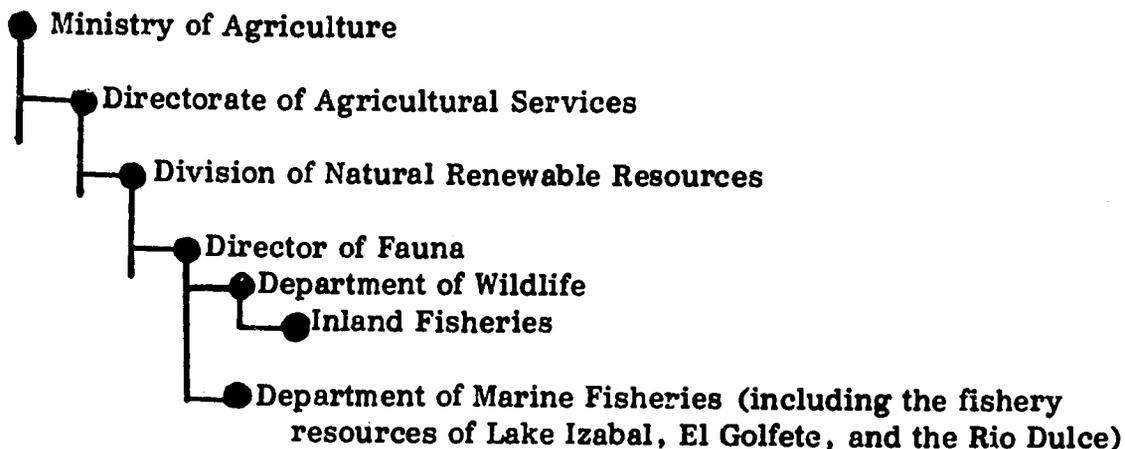
Fish products are usually sold fresh or frozen. Only in a few stalls in the Central Market were dried fish offered for sale. Very few freshwater fish were observed in the markets; a few largemouth bass, bluegill and guapote were seen. However, the survey was conducted during the period May through August when inland waters were closed to fishing by gill nets. Undoubtedly a larger variety and quantity would be offered for sale during

the open season. The range in price of meat products reflects the conditions under which they are sold and the quality of the product. In this respect, fish sold in the Central Market were usually not held under refrigeration and were somewhat less expensive than the same species sold in the supermarkets.

Very few retailers had facilities for holding fish more than a day. As a result, the merchants indicated that they would purchase somewhat less than they probably could sell to protect themselves from loss. Also, it did not appear that the demand for fish products exceeded the supply except possibly during Easter week.

### 2.3 Government Division Responsible for Fisheries

The Division of Fauna within the Ministry of Agriculture has responsibility for the fish and wildlife resources of the country. The Department of Wildlife has the responsibility for inland fisheries, but not for those waters connected to saltwater by major rivers; as a result the fishery resources of Lake Izabal, El Golfete and Rio Dulce are under the jurisdiction of the Department of Marine Fisheries. An abbreviated organizational chart showing the relationship between government agencies within the Ministry follows:



The Department of Marine Fisheries is not staffed nor equipped for research studies necessary to assess the fishery resources of Lake Izabal. Although a few staff members have received short-term training in fishery-related fields, none have been trained in fisheries biology and population dynamics. Also, the Division appears to be severely handicapped by a very limited operating budget. As a result, the activity of the Department has been confined to the collection of catch statistics and carrying out marketing surveys.

#### 2.4 Lake Izabal, El Golfete and the Rio Dulce Water Resources

Lake Izabal is located about 35 km up river from the town of Livingston; it is connected to the Gulf of Honduras in the Caribbean by the Rio Dulce. The lake itself is approximately 46.5 km in length, 13.7 km in width, and with a mean depth of 8 - 9 meters. The Rio Polochic flows into the lake at its western end resulting in an extensive deltaic region. The lake is oblong in shape with a "saucer shaped" basin. The bottom is mostly soft mud. The prevailing winds are easterly so that most of the southwest shore consists of windswept, sandy beaches. The northern shore is covered with thick vegetation.

The lake and river system has served in the past as an important transportation route between the old rail head at Panzon on the Rio Polochic and the coastal cities of Livingston and Puerto Barrios. Today, a hard surface road and rail line extend from Guatemala City to Puerto Barrios on the Caribbean.

The Rio Dulce and El Golfete, however, still serves as a transportation route from Livingston to the road system connecting San Felipe to Guatemala City.

Recent limnological investigations indicate that during the dry season, salt water from the Gulf of Honduras moves by tidal and wind action into the eastern end of the lake. However, during the wet season with the increased flow of water through the system, the lake and upper sections of the river are flushed of their salt content (Brinson, 1973).

### 3.0 THE FISHERIES

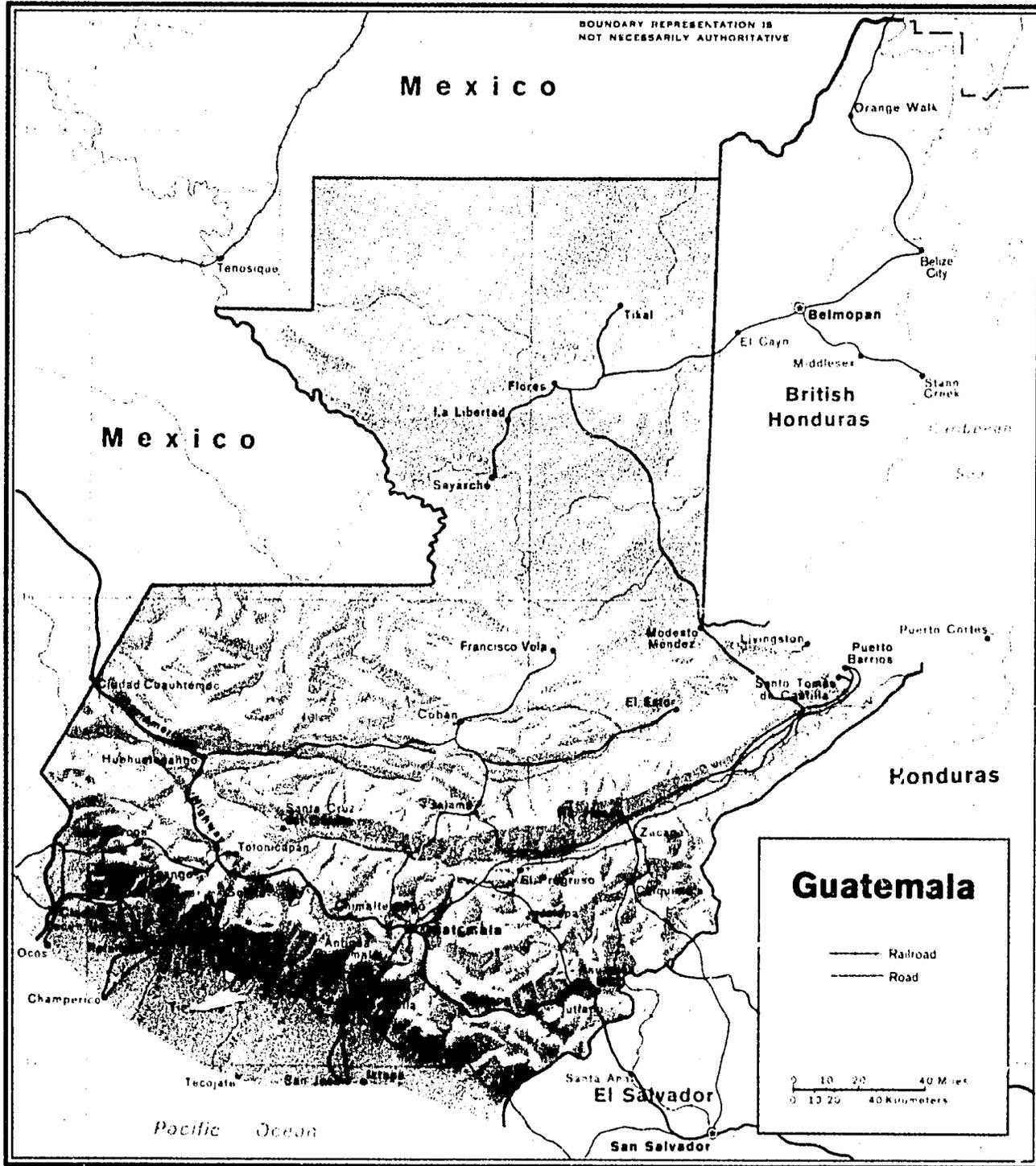
#### 3.1 Lake and River Fisheries

As in many tropical freshwater lakes connected to the marine environment, there exists in Lake Izabal, populations of marine animals. The fish fauna include sawfish (Pristis perotteti and P. pectinatus), jack (Oligoplites sp.), bull shark (Carcharhinus leucas), tarpon (Megalops atlantica), dolphins (Tursiops truncatus), snook (Centropomus sp.) and several species of marine catfish (Arius sp.). Freshwater representatives include the cichlids (mainly mojarra, (Chichlasoma sp.)).

Very little fishing activity was observed during this survey because of the existing regulation which prohibits gill net fishing during the period May through August. However, commercial fishing is apparently concentrated in two areas, the deltaic region of Lake Izabal and the Rio Dulce east of the El Golfete. The Department of Marine Fisheries reports only 70 full-time fishermen and 150 part-time fishermen on the lake itself. In Livingston, approximately 80 percent of the population (about 1,700 individuals) are engaged in some fishery-related activity. It has been reported that some of these fishermen occasionally fish the waters of El Golfete and Lake Izabal.

FIGURE 1

MAP OF GUATEMALA SHOWING LOCATION OF LAKE IZABAL



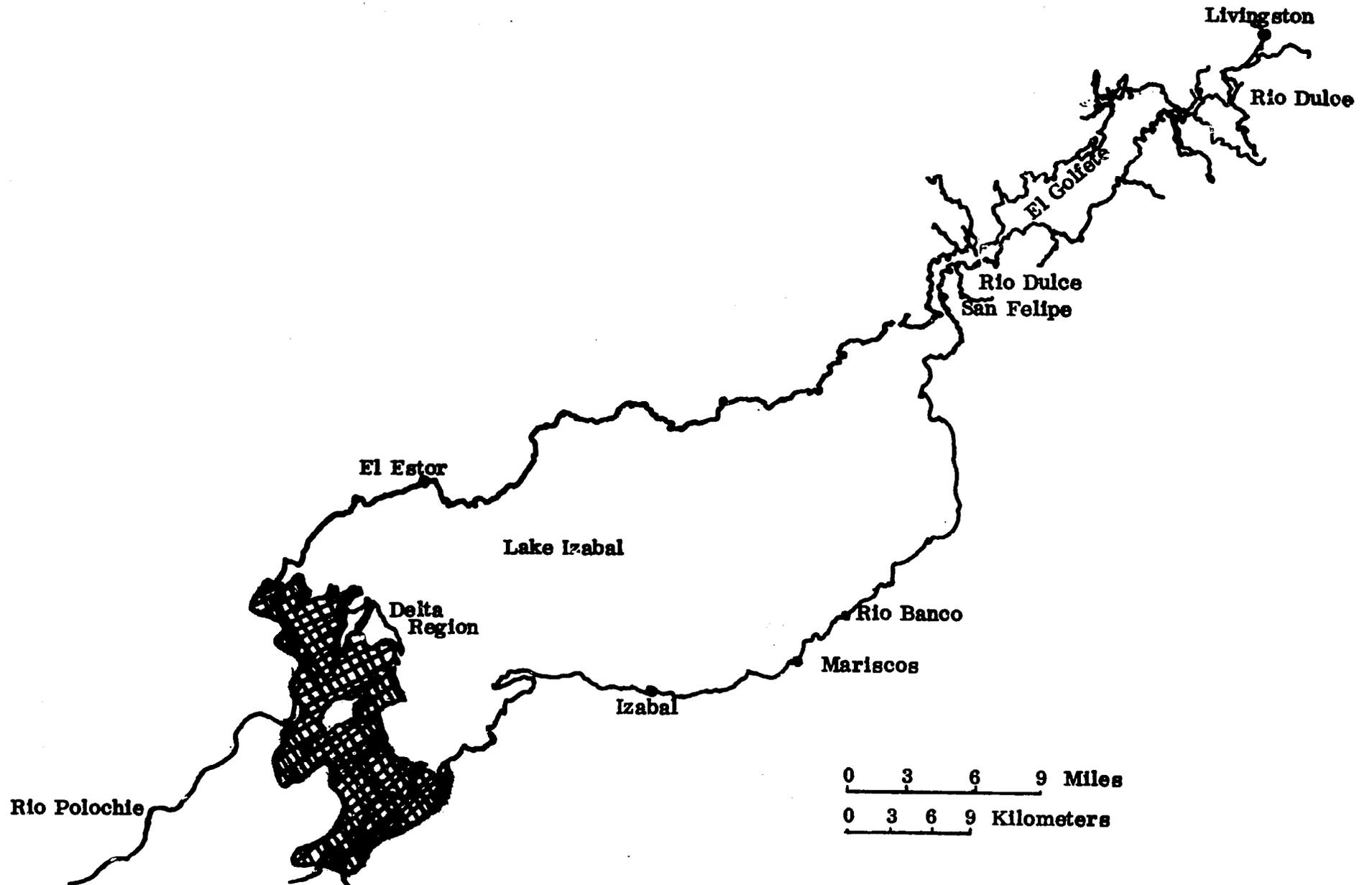
On both the lake and river, full-time fishermen use cotton or nylon multi-filament gill nets. At Livingston, the average mesh size observed was 10 cm (bar measurement); these nets were from 2 - 3 meters in depth and profusely hung with heavy weights so as to keep them in place when set across the current. Several nets would be fastened together so as to extend almost the entire width of the river. Part-time fishermen were observed fishing with hook and line (with small tomato-like fruits for bait) for mojarra and bagre.

Two fish buyers were operating out of Livingston. Fish (mainly snook) were purchased from fishermen for \$0.10 to \$0.20 per pound, held on ice and then shipped to Guatemala City via the Rio Dulce to San Felipe. Shark, tarpon and other "lower quality" fish were sun dried and sold locally. In this respect, a FAO-constructed processing house, complete with tables and a dryer is available. However, the facility is not presently being used for this purpose. Fishermen offered a variety of reasons, the most common being that the facility was located at too great a distance from where the majority of fishermen landed their catches; in addition, the door was locked and no one knew who had the key.

Very few lake fishermen could be contacted for an interview; however local officials verified that practically all of the full-time fishermen used gill nets. The few gill nets that were observed drying were constructed of coarse, cotton twine and hung with large styrofoam floats. The large mesh size (6 - 10 cm bar measurement) indicated that in the lake as well as in the river, fishing effort was being directed toward the large marine species (mainly snook and tarpon). Part-time fishermen on the lake used hand lines; their catch consisted mainly of mojarra and bagre.

FIGURE 2

LAKE IZABAL, EL GOLFETE AND  
RIO DULCE



Much of the catch in the western end of the lake is sold locally. The small lake-shore towns of El Estor, Izabal, Mariscos and Rio Banco evidently provide a sufficient market for local lake fishermen.

### 3.2 Fishing Regulations

Fishing regulations are established by the Division of Fauna. One set of regulations apply to all inland waters of Guatemala. They are written in a popular style which personifies the fish as a friend of the fisherman. A direct translation is provided in the Appendix.

If fishing regulations were enforced, it would be relatively easy to determine fishing effort and yield of the fishery resource. However, local officials who have the responsibility for issuing licenses and taxing the catch indicate that it is extremely difficult to enforce these regulations; thus the Directory of Fauna has very little information for assessing the fishery.

Most gill net fishermen on both the lake and river system apparently respect the 4-month closed season during which they obtain fish for their own consumption by hook and line. Snook reaching the Guatemala City markets during this period were coming from a limited amount of fishing in the river mouth and bay area near Livingston. During the closed season, many fishermen fish for shrimp with cast nets in the bay or use the period for mending their nets. In the western end of the lake where fishing would be less obvious, there was evidence that some gill netting is done throughout the year.

### 3.3 Assessment of the Fisheries

Because of the rapidly increasing habitation of the area, the fishery resource will be exploited in the future at a greater rate. The present number

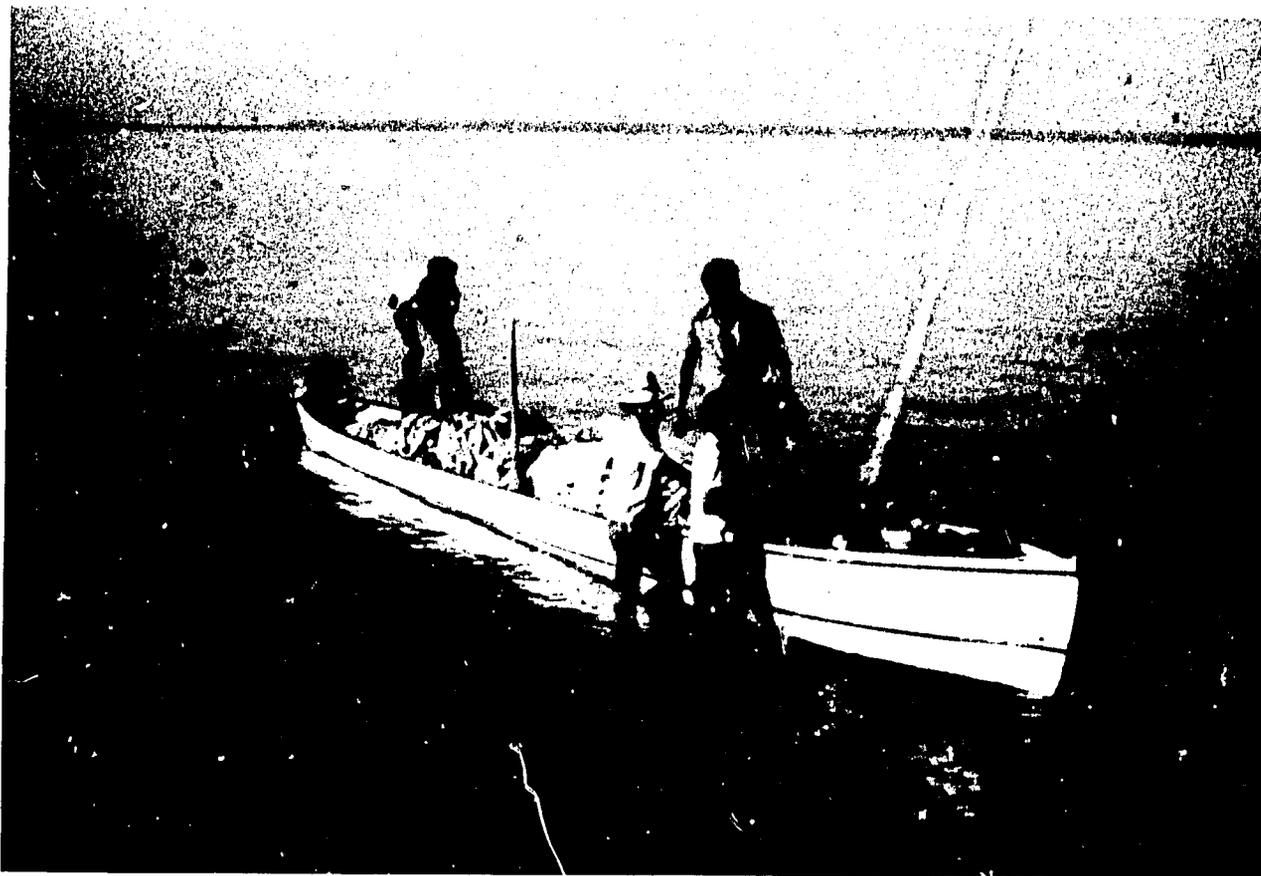
of full and part-time fishermen estimated to be fishing does not appear excessive for this lake and river system, even though it has been reported that the average catch per fisherman has declined in recent years. Most tropical waters are capable of producing sustained annual yields in excess of 10 kg/ha (9 lbs/A). The lake itself is reported to be approximately 63,700 ha in size. This would suggest a potential annual harvest of more than 637 metric tons. Judging from the style and mesh of the gill nets presently in use, it does not appear that the freshwater and small species are being harvested to any great extent. However, it is possible that fishing pressure, especially in the river, has reduced the number of the large marine species in the lake.

#### 4.0 RECREATIONAL USE OF LAKE IZABAL, RIO DULCE AND EL GOLFETE

These waters may best be suited and developed for recreational use. Already the area is catering to an increasing number of tourists. Three hotels, located near San Felipe, offer rooms and meals at modest cost. Attractions to the area are sight-seeing, fishing, swimming and boating.

Sight-seeing is popular with excursions by motor launch scheduled from San Felipe to Livingston (\$2.50/person) and El Estor (\$3.50/person). The boat trip from San Felipe down the Rio Dulce to Livingston offers the tourist some unique experiences. The river flows past white limestone cliffs that extend vertically at times 15 - 18 meters from the waters edge. The tropical vegetation that overhangs the cliffs is lush and virtually undisturbed. Located on a point of land where the Rio Dulce flows out of the lake is the restored Spanish castle constructed in 1657. Also, the Maya ruins at Tikal are within one hours flight from San Felipe.

**FIGURE 3**



**Outboard motor powered canoes commonly used for lake and river transportation.**

**Sport fishing for snook, tarpon and mojarra is usually done with hand lines. Either a spoon or eel and jig is trolled, or a baited hook is used. Fishing success for snook and tarpon is reported to have declined in recent years; the decline has been attributed to increased commercial fishing activity in the river below El Golfete. Fishing for mojarra, however, with hook and line is still productive although not very popular. Tourists can rent a boat, motor and guide for fishing at a cost of \$1.50 per person per hour.**

**Swimming, water skiing and sailing are popular weekend activities. Hotel operators promote these activities by having motor launches and skis for rent. They indicate that there are no longer any sharks in the area and give credit to commercial fishing activities for eliminating this hazard.**

## **5.0 SUMMARY OF SURVEY AND PROPOSED RECOMMENDATIONS**

### **5.1 Summary**

**The fish stocks of Lake Izabal, Rio Dulce and El Golfete represent a valuable natural resource to the people of Guatemala. Because of the increase in recent years in both the sport and commercial utilization of the resource, it is essential that a realistic management policy be determined to realize the maximum sustained benefits. This is especially true for Lake Izabal. Little fishing activity was reported by Hollaway when he surveyed the lake in 1945 (Hollaway, 1950). Since then, fishing activity and catches have increased. Recently, however, the average catch per fisherman has declined. This situation is common to developing fisheries and does not necessarily indicate over-fishing. It does indicate, however, that fishing pressure has reduced the initial stock abundance.**

to some extent and biological studies are needed to determine what level of abundance, and fishing, will provide for the greatest production.

The Rio Dulce and El Golfete system is subjected to intensive pressure by gill net fishermen. Nets of various depths and mesh size are traditionally set to extend almost the entire width of the river. Escapement of snook, tarpon and other marine species ascending the river must be limited; this method of fishing, however, probably represents the most efficient means of harvesting these species. Biological and economic studies are required to determine what affect this fishery has on the sport and commercial catch upstream and the reproductive success of the species involved.

## 5.2 Recommended Scope of Work

Little information is available on the biology and dynamics of the fished stocks that is readily transformed into management policy. A recommended scope of work includes the following:

Biological Basis for Management: The greatest present need is for estimates of total yield, seasonal variation in yield, species and size composition of the catch and the associated fishing effort. These characteristics of the fishery can be estimated by periodic sampling of the catch and associated gear. A preliminary census of fishing activity is recommended to provide sufficient data for planning an effective sampling design.

Exploratory and experimental fishing can provide information on populations or parts of populations not represented in the catch by fishermen for

**FIGURE 4**



**Fish landed at Livingston being processed on a sea wall near the dock area.**

studies concerning the reproductive biology, food habits and growth of important food fishes.

The gill nets presently used by fishermen are constructed of multi-filament cotton or nylon and are profusely hung with large weights and floats. The cost and maintenance of fishing monofilament nets with a twine size no greater than 0.40 mm in diameter should be compared to that of nets presently in use. For a comparative evaluation, nets and net material should be loaned to fishermen and their catch and other data recorded by project personnel. Also recommendations or comments by fishermen participating in the study concerning the fishing characteristics of the nets would be important.

Also, procedures for catching the large snook and tarpon in the lake and river with rod and reel should be determined. Present tactics consist of trolling a silver spoon or an eel and jig by hand-line; fishing success, using these methods, probably will not attract a great number of sport fishermen to the area.

Economic Aspects of Management: The fisheries of this region are handicapped by the distance to market and lack of adequate processing facilities. However, the processing house and drying shed constructed by FAO at Livingston is not being used. Fishermen indicated a variety of reasons, but the most obvious fault was its location; the facility was evidently too far from where the majority of fishermen landed their catch to be useful. Costs of providing training and additional facilities need to be investigated.

The existing restrictions on fishing prohibit gill net fishing for all lakes and rivers in the country during the months of May, June, July and August. For the most part, fishermen adhere to these regulations and limit

their fishing during the closed season to hook and line. This blanket restriction without regard to local conditions does not appear reasonable. For example, the restriction on gill netting in Lake Izabal probably could be modified to permit a limited amount of fishing throughout the year.

It should be determined if the size of the fish can be regulated by mesh restrictions and what economic advantage there might be in doing so in terms of increasing the market value of the catch. This information coupled with biological information on the fish stocks and status of the fishery will allow administrators and economists to determine the most appropriate form of regulation.

### 5.3 Program Requirements

The recommended study for the Lake Izabal, El Golfete and Rio Dulce system will require that a lake study program be established within the Ministry of Agriculture. Host country personnel required are two biologists, two technicians and a boat captain. Initially, the proposed study will require the assistance of an in-country fishery advisor for a period of at least 3 years; he should be experienced in lake survey techniques, use of fishing gear and fish population dynamics. The fishery advisor will provide on-the-job training for counterpart personnel and coordinate work activities.

An essential part of the program will involve training host country personnel in fisheries biology and management. Two biologists should be provided with scholarships for university training in fisheries biology. Ideally, the two biologists chosen to participate in the program will be qualified for graduate study leading to an advanced degree. In this respect, funding for each participant should be provided for a 24-month period.

**FIGURE 5**



**Fisherman at Livingston making a new section of net during the season closed to gill netting.**

In addition, the Ministry of Agriculture should consider requesting the assistance of at least two Peace Corps Volunteers with training in some aspect of lake fisheries. These individuals would be especially helpful in the initial stages of the program.

Contributions to the program are recommended to come from the following sources:

<u>Contract by USAID</u>	<u>Government of Guatemala</u>	<u>U.S. Peace Corps</u>
Fishery advisor for a period of 3 years to include in-country and overseas travel, fringe benefits, etc.	Permanent positions for two biologists, two technicians and a boat captain.	Two Peace Corps Volunteers for the Lake Study Program.
Equipment funds (freight and insurance) for initial and operating expenditures not to exceed US \$30,000 (1st year) and US\$15,000 (2nd and 3rd year)	Secretarial assistance, office and storage space both in Guatemala City and in the vicinity of San Felipe, Lake Izabal.	
Special consultants not to exceed 10 man-days per year.	Transportation (vehicle and vessel maintenance and fuel) and travel expenses for host country personnel.	
Two scholarships (24 months each for university training in fisheries biology).		

**6.0 CONFERENCES****U.S. Government**

<b>Mr. Daniel A. Chaij</b>	<b>Director, Office of Rural Development</b>
<b>Mr. Robert Bravo</b>	<b>Agriculture Advisor, Agriculture and Natural Resources Division</b>
<b>Mr. Joseph S. Courand</b>	<b>Agriculture Advisor, Agriculture and Natural Resources Division</b>
<b>Mr. Gerald R. Wein</b>	<b>Program Economist, Office of SOCIU Economic Analysis</b>
<b>Mr. Dennis Custage</b>	<b>Deputy Director, Peace Corps, Guatemala</b>
<b>Mr. David Bowman</b>	<b>Peace Corps Volunteer, Atitlan Fisheries Project</b>
<b>Mr. Andres S. Hernandez</b>	<b>Agriculture Advisor</b>
<b>Major Charles Stulga</b>	<b>Major U.S. Army</b>

**Guatemala Government**

<b>Eng. Mario Martinez Grutierrez</b>	<b>Minister of Agriculture</b>
<b>Eng. Roberto Perdomo van Vilsteren</b>	<b>Vice Minister of Agriculture</b>
<b>Lic. Carlos A. Silva C. II</b>	<b>Economist, Department of Fisheries</b>
<b>Gregorio Ellis Parham</b>	<b>Captain, Research Vessel "Manatee"</b>
<b>Ccl. Rene Mendoza</b>	<b>Commandant of the Navy</b>
<b>Julio Ranero Aparicio Lobo</b>	<b>Director; Division of Fauna</b>

**FIGURE 6**



**Hotel Marimonte, near San Felipe, offers rooms, meals and recreational facilities for tourists.**

**7.0 LITERATURE CITED**

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- Whetten, N.L., 1961. Guatemala - The land and the people. Yale University Press, New Haven, Conn.**

## 8.0 APPENDIX

### 8.1 Fishing Regulations for Guatemala (direct translation)

#### **Friend Fisherman:**

I am part of the natural resources of the country. My existence is of vital importance for your subsistence, that of your family and for the riches of the nation.

In virtue of this, the Government has disposed to protect me, passing laws for my reproduction which you are obligated as a good Guatemalan to respect and make concious in your community so that they may also respect. You should not capture me during the months of May, June, July and August, since if you do, you will be punished and your family will suffer on seeing you deprived of your freedom.

Hold present that in the four months that you don't pursue me I will multiply, which would come to your own benefit and that of your family; on the contrary, I will disappear and you will have to seek other forms of work for the subsistance of your home.

In this pamphlet you will find some of the articles of the fishing law, so that you may know your duties and obligations towards me, and of the sanctions to which you are exposed if you do not respect them.

In accord conformity with Governmental decree, you must fulfill the following requirements to capture me:

- a) Obtain your fishing license at the mayors office of the municipality where you reside, which will be valid in the entire nation, needing be confirmed by the national police.

- b) **Your license may be granted any time, but it is only valid for the year in which it is granted.**
- c) **The license which is granted to you cannot be loaned since it is a personal document.**
- d) **You are obliged to obtain your fishing license and register the equipment you use, and you must present it to all authorities when asked.**
- e) **You will pay the municipal treasury of your municipality the sum of Q3.00 for the license and Q2.00 for the registry of each piece of equipment used by you, and also Q1.00 for each hundred pounds of fresh fish which you extract from the jurisdiction where you fish, or the proportion of Q0.01 (1 centavo) for each pound of fish.**
- f) **You may only employ cast nets, gillnets, thrust baskets, traps, seines and hooks. Never employ explosives or chemical substances.**
- g) **All small fish that have not reached their normal size that you catch should be returned to the waters.**
- h) **You may not practice fishing during the months of May, June, July and August of each year.**
- i) **You may only fish for your own food and that of your family during these four months, but only with hooks.**
- j) **It is prohibited to destroy the eggs of fish, muddy the waters, throw in materials that hurt or endanger them and does not permit their freedom of movement, beat on the waters, oblige them to run in direction to the places where it is set up to capture them, break up or alter the bottoms, drain the river course to capture them, use two or more pieces of gear together of any nature, fish in the lower regions of the river up until five**

**kilometers from its mouth with meshes smaller than 15 centimeters .**

**If you do not fulfill these essential requirements , you will be punished in accord with Legislative Decree which forseees a fine of from 100 to Q5,000, according to the case and if you repeat the infraction, the fine will be double . Besides that, the equipment you use will be confiscated and if you don't pay the fine, it will cause one day of imprisonment for each Q1.00 of fine .**

**On closing my friend fisherman, I recommend the faithful observance of the law . Since as in the beginning I indicated it was promulgated for your benefit and of the country in general .**