

Improving on Nature?

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Life is not easy in San Antonio Palopo in the late 1950s. Carlos rises early to care for his onion crop, pumping water from Lake Atitlan, which the villagers must do in the dry season. After that, he will climb the mountain to prepare his cornfield for planting before the approaching rainy season.

His two-room, dirt-floored hut allows barely enough room for his family, but it is as much as most families in the village have. Fortunately his wife, Rosita, is a skilled weaver. The few tourists who drive here to see the beautiful lake pay only a few coins for her colorful textiles, but the money helps to buy shoes for his children.

On his way up the mountain, he meets his neighbor Iliana coming down the steep path. "Buenos dias, amiga," he greets her. "Hola, Carlos," she responds. She is returning home with a load of firewood so that she can prepare the tortillas for her family's breakfast. "Are you going to the meeting at the church tonight?" she asks.

"Oh, I'd forgotten about it. I appreciate your reminder. Will you be speaking?" Carlos inquires.

"No, I'm much too shy for that," she says, "but my cousin Victor is coming from Guatemala City with an important proposal for the people of San Antonio Palopo."

"Victor? Isn't he the airline executive?" asks Carlos.

"Well, he's not really a big boss, but Pan American has sent him because he knows us. It seems like a big deal," Iliana replies.

"How big could anything ever be in this village?" Carlos wonders aloud.

"I'm not too sure of the details," Iliana says, "but it's a plan to bring a new kind of fish to the lake. The airline is hoping to increase tourist flights to Guatemala, and the hotel owners in Panajachel are eager to have more tourists, too. If the lake becomes famous enough, fishermen will come from Norte America and maybe even Europe to catch fish, eat meals, buy my weaving, things like that. Can you imagine a restaurant or a hotel in San Antonio? We might even have to learn English to handle the crowds of customers!"

They chuckle at the prospect of their narrow village streets crowded with tourists and then go their separate ways.

Image Credit: Photograph of Lake Atitlan, Guatemala, provided by the [Association of Guatemala Tourism Guides](#), a member of the [World Federation of Tourist Guide Associations](#). Used with permission.

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Background Briefing I

"Promoting Tourism by Introducing Black Bass into Lake Atitlan"

The name "black bass" is collectively used for three species of bass also known as largemouth, smallmouth, and spotted bass. The fish proposed for introduction is the largemouth bass, *Micropterus salmoides*. It is green with dark blotches forming a dark line along the sides of the body. Because the upper jaw extends far behind the eye, its mouth is relatively large, as the name suggests.

In many states in the U.S., it is the most popular game fish. Hundreds of clubs and numerous magazines promote it as a sport fish, and an estimated 26 million Americans fish for this species. The meat is light, flaky, and tasty, with low oil content. Trophy-sized individuals are common. The world record fish, caught in Georgia, weighed 22 pounds, 4 ounces. Lengths of 32 inches have been recorded.

Eggs are laid in quiet water two to eight feet deep. Each female lays as many as 40,000 eggs. The male guards the nest. There may be two or three spawnings per year, depending on water temperature. The young hatch in five to 10 days and feed on plankton and insect larvae.

Bass are voracious predators, willing to eat almost anything that moves. When they reach about two inches in length, they begin to prey on other fish, frogs, salamanders, snakes, small rodents, and small birds. (In the U.S., they contribute to the health of a pond ecosystem by keeping bluegill populations under control.) Invertebrate prey includes crayfish, crabs, worms, insects, and mollusks. The bass tend to remain concealed among rocks or logs in a small home area and wait for food animals to come by. They swallow their prey whole.

Largemouth bass survive well in almost any clear-water environment. Its original distribution covered most of the U.S. east of the Rocky Mountains, but the species has been introduced into most of Mexico and Central and South America, as well as a wide area of Europe.

Bass fishing is an exciting sport. The fish can be caught with the kind of tackle that any U.S. angler would use, but have special appeal to those in scuba gear using spears. They will strike lures aggressively and swim rapidly. Studies of their behavior reveal a great wariness and reluctance to be fooled twice by artificial bait or even live bait on a hook.

Raising bass in a commercial hatchery environment has proved to be quite successful and profitable. The young fish can be trained to eat food in pellet form.

Background Briefing II

"Lake Atitlan's Villages"

Only a three-hour drive by car from Guatemala City, Lake Atitlan is a prime spot for tourists to visit. The roads leading to the area are good.

Thirteen villages lie along the shore, inhabited primarily by a native Mayan population of about 27,000 in 1950. One of them, Panajachel, has a market that attracts some tourists already; the others are less well-known. Some can be reached most quickly and conveniently by boat. The region has one of the highest poverty rates in the world.

Part of the charm of the area is that the lives of the people closely resemble those of their ancient ancestors. Local residents carry on traditions of interest to tourists. Weaving is a skill that every Mayan woman learns in order to make clothing for the family. Each village has a unique pattern of fabric used to make the costume of the women; sometimes the men have unique costumes as well. Textiles are available for sale in the form of scarves, blankets, and fine embroidery.

Some residents are skilled in other handicrafts and arts, such as painting, woodcarving, and jewelry-making. Weavers create floor mats from the local reeds and from tul, an underwater plant. Lake Atitlan's reed beds, the finest in the country, are owned or rented by individuals who harvest them for their own use or for sale.

Another aspect of the local tradition is the use of the lake as the community laundry. Almost any morning one can see local women washing the family's clothing on the rocks at the shore using homemade soap of pig fat and lye.

Mayan culture is based on a diet of corn, with tortillas and tamales being a menu staple. Farm fields can be seen high on the mountain slopes, where corn, beans, and squash are raised in a traditional manner. Some pesticides are used, but typically no fertilizer is added to the soil. Chicken and pork (never beef) may accompany the vegetarian fare, but perhaps only twice a week. Crab soup is a popular dish, and fish provide a major source of protein in the diet.

Some villages have other cash crops as well, such as onions, avocados, strawberries, and coffee. These crops are raised near the shore and are irrigated by pumping water from the lake as needed during the dry season.

Fish have traditionally been caught in woven wicker traps baited with corn. More recently, fishermen have used simple lines and hooks from their homemade dugout canoes. The use of nets is rare, as they are too expensive. Crab fishermen drag a line of multiple hooks through shallow water at night by torchlight or spear the crabs from their canoes.

Some villagers offer boat transport service across the lake. There are small hotels in some villages.

Background Briefing III

"The Lake Atitlan Ecosystem"

Lake Atitlan, described by some as the most beautiful lake in the world, lies at an elevation of 5,100 feet in the highlands west of Guatemala City. It occupies a large volcanic crater with a depth of 1,000 feet or more and a surface area of 79 square miles.

The water of Lake Atitlan is clear, visibility being as great as 39 feet, and the temperature remains constant year-round at 70-72° F. Two small rivers, rainfall, and underground sources supply the lake with water. It does not have a visible outlet, but drains from the bottom. Because of the alternating rainy and dry seasons, the water level fluctuates by about three feet each year.

Steep slopes, including three volcanic peaks, surround the lake on all sides. Large growths of reeds and cattails grow along about 15 miles of the shoreline. These tend to filter the runoff from the surrounding slopes and provide wildlife habitat for many species.

Wildlife abounds in, on, and around the lake. Aquatic species include 18 kinds of small fish, various amphibians such as frogs and salamanders, crabs, crayfish, and numerous small invertebrates such as insects.

Bird species found in the area include herons, which are large, long-legged wading birds with long necks. They typically stand motionless in shallow water, waiting to spear frogs and fish with their long beaks. They make nests of sticks in bushes and trees.

Ducks of various kinds can be found. A prominent example is the ruddy duck, so named because of its bronze-colored body. Its diet is about one-fourth aquatic animals and three-fourths plants. It feeds on the surface or by diving, often at night. The nest of up to 20 eggs floats among reeds and rushes. This duck flies well, but needs a long run before take-off.

Gallinules and coots are chicken-like birds found wading in shallow-water areas. Their long toes allow a distribution of their weight as they walk across lily pads to feed. They also feed on land, as well as by swimming and diving. Food includes frogs, shellfish, insects, and plants. They are not good flyers. Their nests are either floating or out of water on a clump of grass.

Giant grebes are native birds thought to live only on this lake. Rather than webbed feet, they have long, lobed toes. Their legs are placed far back on their bodies, making them almost helpless on land. Wings are small compared to their body size, so flight is impossible. These birds are excellent divers, however. They make a floating nest for 2-5 eggs in shallow water among reeds. They feed on tul (an aquatic plant), fish, and invertebrates.