2 The Tropical Forest

Welcome to the rain forest! The words "rain forest" have become a generic term used to describe a wide variety of tropical forests that occur (at least historically) in a four-million-square-mile band close to the equator, between the tropics of Cancer and Capricorn. Rain forests cover 7 percent of the earth's land surface but contain more than half of its living species of plants and animals.

Volumes have been written about tropical forests, but there isn't a tropical ecologist in the world who won't tell you that we've barely scratched the surface on what there is to be known. Still, it's possible to describe what is known. Below is a description of the natural phenomena of some of the different types of forest found in Costa Rica. Following this are some of the species of flora and fauna that you are likely to encounter on your visit to a tropical forest in Costa Rica.

HOW A TROPICAL FOREST WORKS

The Quick Change

Tropical soils tend to be much poorer than soils in temperate zones. One reason for this is that organic matter has little time to build up in the soil; it tends to be reabsorbed by living plants almost as soon as it hits the forest floor. This is accomplished by a host of bacteria and fungi and the generally wet, warm climate. Peel back the thin layer of dead leaves in a tropical forest and you will find a lacy network of fungi. The roots of the trees are aided by other species of fungi, called mycorrhizae, which absorb minerals and pass most of them on to the tree.

From the Floor to the Canopy: The Layered Look

Undisturbed tropical forest is usually separated into layers, each of which has its own plant species. At the top are occasional emergent trees, giants that can tower 60 meters above the forest floor. The next layer is the canopy, a dense, interlocking mass of greenery formed by the treetops. It might surprise you to learn that the canopy is the layer that supports the most number of animal species of any part of the forest. The reason is that this is the part of the forest that receives the most energy from the sun, and where the trees flower, which draws birds and insects of almost unimaginable variety. Many species of plants and animals carry out their entire lives in the canopy without ever touching the ground. Under this are one or more layers of understory, smaller trees and shrubs. At the bottom is the ground layer, which is usually surprisingly sparse due to the lack of light reaching the forest floor.

Light Gaps

There comes a time in the life of every emergent giant (a tree that rises above the rest of the canopy) when life at the top becomes too rough and it falls to earth, creating a gap where the energy of the sun can penetrate to the forest floor. There then ensues an almost immediate battle for a place in the sun among the products of seeds that have been lying dormant in the soil. It may take many years for the fallen giant to decompose, providing nutrients for the victors of the struggle to continue the whole process anew. Light gaps are also places where many species of insects and birds congregate, and they are the favored haunts of many species of snakes, both venomous and not, which love the access to the sun to warm their bodies. It's a good idea to watch your feet and hands when you're passing through a light gap.

Buttresses and Stilt Roots

You will probably notice a number of differences between the trees that you are used to seeing in temperate regions and those in Costa Rican forests. In wetter regions, tree trunks are often buttressed at the base. These buttresses, called *gambas* in Spanish, are mostly for support in thin soils, but they may have other functions such as gas exchange. Some types of trees, particularly palms, produce stilt roots for support, but again, these may have other functions.

Buttress roots, or "gambas," on forest giants, Corcovado National Park

FLORA

Life Zones: It Isn't Just "Jungle" Anymore

Tropical forests are divided into three broad categories: tropical dry forests, tropical moist forests, and true rain forests. Each of these is further divided into subcategories, based on factors such as elevation, climatic conditions, and soil type. At first glance, a tropical forest may look like one solid wall of greenery, but on closer examination, the variation in plant life is striking, to say the least.

Even though Costa Rica is only the size of the state of West Virginia, there are twelve distinct subdivisions of plant community types, called "life zones," found there. They range from the tropical wet forests of the Caribbean lowlands to the subalpine *paramo*, a high, cold grassland that is most typical of the Andes Mountains much farther south. Identifying what life zone you are passing through often takes a lot of work. There are a number of variables, including elevation, rainfall, the heights of vegetation layers, and species composition.

If you took a trip from west to east and coast to coast, starting in the northwestern region (say, in Santa Rosa National Park), you would pass through quite a few of these life zones. Coming in from the beach, you would pass through an area of ***tropical moist forest***. This is the most extensive life zone in Costa Rica. Tropical moist forest is characterized by tall evergreen forest (meaning that most of its trees do not lose their leaves, not that these are conifers) with multiple layers. Canopy trees are 40 to 50 meters tall. Most canopy trees have straight trunks that are relatively slender and are unbranched until 25 to 35 meters. Subcanopy trees are about 30 meters tall, and understory trees are 8 to 20 meters tall. Palms are common in the understory. Epiphytes, vines, and woody lianas ("Tarzan vines") are abundant.

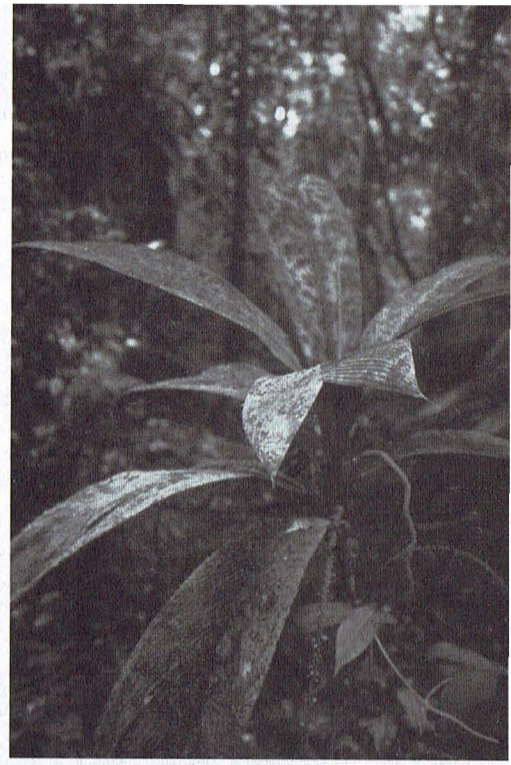
Traveling a little farther inland, but still in Santa Rosa, we pass through a ***transition zone*** (a mixture of two life zones) before entering true ***tropical dry forest***. This forest has a distinctive, seasonal change of appearance. In the dry season, most of the trees are leafless (to save water) and the land is in shades of gray and brown. When the rains come, all is green. The forest is fairly short in stature, with canopy trees being between 20 and 30 meters in height. The understory layer is usually 10 to 20 meters tall, and members of the coffee family ***(Rubiaceae)*** are common. Woody vines are common, but herbaceous vines are uncommon. There are some ***epiphytes*** (plants that live on trees—see the section to follow), consisting mostly of bromeliads. This has been one of the most heavily used and abused life zones in the country, being easy to clear and burn because of the distinct dry season.

After traveling across a human-made landscape of pasture and grassland, you come to the volcanoes of Guanacaste National Park. These rise precipitously, and the vegetation change is dramatic. After passing another band of tropical moist forest, the transition is made to ***premontane wet forest***. The forest is semi-evergreen (a few canopy species shed their leaves in the dry season) and reaches a height of 30 to 40 meters. The buttresses on trees are smaller than are those of lower-elevation forests. Understory trees are 10 to 20 meters tall with smooth, often dark bark. Stilt roots and long strap-shaped leaves are common. There are some ***tree ferns*** (plants that have been around since before the dinosaurs; these will be discussed later). The shrub layer is 2 to 3 meters tall and often dense. The ground layer is usually bare except for ferns.

Around the very tops of the volcanoes are examples of ***lower montane rain forest***, the life zone that is commonly referred to as "cloud forest." The forest has shrunk in stature, with the canopy at 35 to 30 meters tall, but with occasional oaks reaching upward of 50 meters at the lower altitudes. Buttresses on trees are uncommon, and the understory is dense. The ground is covered with moss and herbaceous plants. The higher you go, the colder and mistier it gets, eventually stunting the plant growth enough to create "elfin forest."

Moving back down the other side of the mountains, you pass through variations of the same life zones that you encountered coming up, with the exception of tropical dry forest. You travel across the Tortuguero Plains, which were once covered with dense tropical moist forest, and pass remnants of this life zone in Tortuguero National Park. Also contained in the park are examples of ***tropical wet forest***, which is the most species-rich life zone in Costa Rica. The forest is tall, evergreen, and has distinct vegetation layers. Canopy trees are 45 to 55 meters tall, with some emergents even larger. Trees tend to have high, well-developed buttresses. Subcanopy trees are 30 to 40 meters tall, and they have narrow, conical crowns and slender boles that are often twisted or crooked. Stilt-rooted palms are often abundant. There are lots of dwarf palms in the shrub layer. The ground layer is sparse, with a few ferns.

There are lots of variations on this scenario. For a complete breakdown of all of the life zones, please see one of the sources in Suggested Reading.



"Stained glass" palm, Rara Avis Wildlife Refuge

Epiphytes

Look up into the trees of any of Costa Rica's forests, and you will see that almost all the trees have at least some form of epiphytes growing on them. ***Epiphyte*** is a Greek word for "upon plants" and refers to any type of flora that uses another plant for support. These include orchids (more than 1200 species), bromeliads (pineapple family), and many other species of seed-bearing plants. Bromeliads are interesting in that the larger varieties hold up to a gallon of water in their centers, creating an aquarium of sorts that contains an amazing variety of plant and animal life. Also present in wetter forests are many species of ferns,

mosses, liverworts, and algae. In the dry forests of the northwest there is even a cactus, called the night-blooming cerus, that grows in trees. It blooms only at night, with large, spectacular white blossoms that smell like jasmine.

Trees

To the average temperate-zone naturalist, tropical trees come in a bewildering variety. They are difficult to identify because of the huge number of species present, the often-similar appearance of their barks, and the thickness of the canopy, which makes it difficult to pick out individual leaves. Some of the easiest distinguishing characteristics are their seeds, found around their bases.

The balsa is a "pioneer species" that is often one of the first on the scene after a light gap is created by the fall of a forest giant. It has a 0.5-meter-long seedpod that is covered with golden "hair," giving it the appearance of a huge woolly caterpillar. The monkey pod is a relative of the Brazil nut and has a woody fruit about 4 centimeters in diameter containing twenty to fifty large seeds. The stinking toe or ***guapinol*** has a distinctive 3-centimeter-long, sausage-shaped seedpod that contains seeds that are a favorite food of rodents.

When you examine seeds on the forest floor, it's interesting to speculate how they are dispersed. Some, like wild nutmeg, have a brightly colored, fleshy "aril" that surrounds the seed. Many species of birds are attracted to the fruit, swallowing it whole to digest the aril and depositing the seed elsewhere. Other seeds are wind-dispersed, such as those of the mahoganies, and have dispersal mechanisms similar to the maples of temperate regions.

Other interesting trees include the so-called "naked Indian." This tree sheds its reddish outer bark (hence the insulting name) to reveal a layer of photosynthesizing cells underneath. This allows the tree to carry on producing food even though it loses its leaves during the dry season to conserve water. A more politically correct and descriptive name has been proposed: "sunburned gringo."

Strangler figs start life when a monkey or bird leaves a seed (usually contained in feces) somewhere in the crown of a tree. The seed germinates and sends tendrils to the ground. The tendrils fuse together, creating a crude mesh, and the fig develops a crown of leaves that eventually shade out the leaves of its host. The strangler is left standing long after its host has decomposed, and it can become a large tree itself.

Most people know that maples and birches are tapped for their sap in the Northern Hemisphere, but few know that there are tropical trees that are utilized in a similar way. The cow tree ***(Brosimum utile)*** is recognizable by its large size and distinctive reddish-gray bark. This species was tapped for centuries for its drinkable white latex. It is thought that the large homogeneous stand of this tree on Isla del Caño south of Manuel Antonio National Park represents an "orchard" planted by pre-Columbian people for this use. The sap is supposedly quite nourishing, and Alexander von Humboldt, who was the first to scientifically describe this species in Venezuela, reported that slaves there grew "visibly fatter" during the season when the trees give the most "milk."

Opposite: ***"Monkey ladder" vine***

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Below is an overview of some of the animals that you are likely to encounter in Costa Rica's parks.

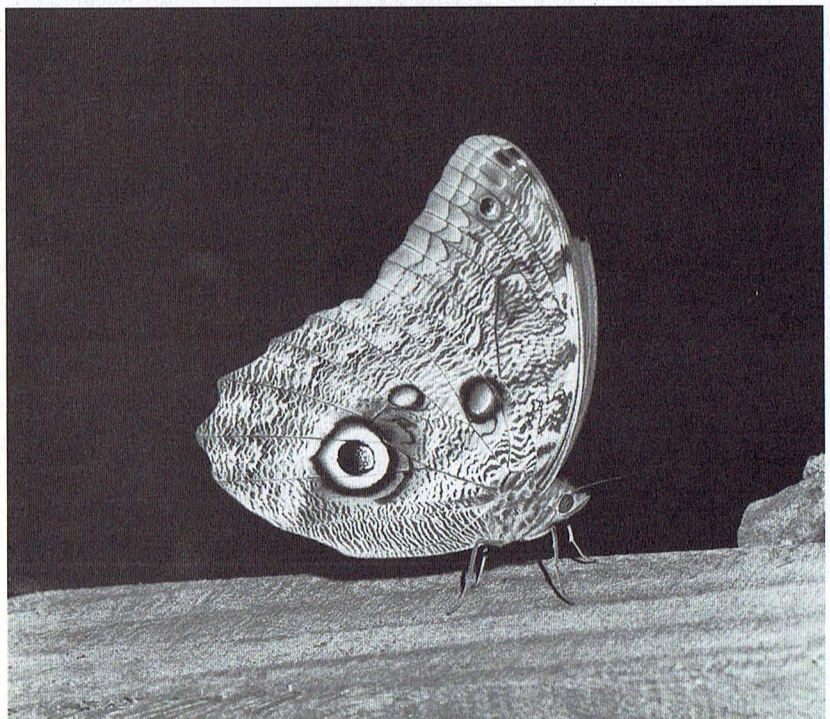
Insects

Butterflies. Costa Rica is home to more than 1239 species of butterflies of every imaginable color. Most spectacular are the bright blue, iridescent members of the genus ***Morpho***, called ***celeste común*** in Spanish. Six species are found in Costa Rica, and they seem to be most commonly observed on the Atlantic side. Males, which are more brightly colored than females, can often be seen patrolling along streams during the morning hours. Males are quite aggressive toward each other, making swooping aerial attacks on potential rivals, perhaps to defend their territory.

Another interesting species is the owl butterfly, so called because of the two large eyelike spots on the bottom of its wings. It's thought that the butterfly uses this as a defense, flashing the eye spots at a predator to make the attacker think that it has taken on something larger and more formidable than it expected.

Moths are also in great abundance, as a visit to a lamp at night will attest. Sphinx moths are a varied family, but all have a distinctive resting position with swept-back wings like those of a jet fighter. One species has a caterpillar that seems to mimic the venomous coral snake. It has a bright yellow body and an orange head, and thrashes about vigorously when molested.

Owl butterfly displaying false "eyes" used to frighten potential predators



Gesneriad epiphyte and bullet ant, La Selva Protected Zone

Ants. One of the most noticeable and interesting types of ants is the leafcutter ant of the genus ***Atta***. These are commonly seen on the forest floor, carrying cut-up leaves back to their nests, which can be more than 3 meters across. The workers chew up leaves and plant a species of fungus on the plant material. This is all that they eat, and the fungus is found nowhere else.

Bull's horn acacia shrubs have a mutualistic relationship with acacia ants of the genus ***Pseudomyrmex***. The ants live in the hollow thorns of the acacia and protect it from any and all attackers, from caterpillars to deer (or the hapless hiker), by biting and stinging vigorously. They even prune back vines or branches that intrude on the acacia's growing space. The acacia not only shelters the ants, but also feeds them nectar from special glands and with lipid-rich "Beltian bodies" located at the leaf tips.

Army ants have an undeservedly fearsome reputation. They are almost blind and have no fixed address. They bivouac for a night to several weeks in hollow logs or underground. Each morning, raiding columns fan out from the bivouac in search of prey up to the size of baby birds, bringing back the spoils to be shared by the entire group. Contrary to popular belief, they don't attack and eat people, but if you stand in the way of a column, they will bite, hard!

Termites. The brown lumps, up to the size of a bushel basket but usually smaller, that you see adhered to trees and fence posts are termite nests. The nests are made of a substance called ***carton***, a mixture of regurgitated wood pulp and feces. The larger nests are home to up to 100,000 termites. In addition to the nest builders, some small parrots nest nowhere else, and there are a number of insect specialists who make a living off the termites. Included in this bunch of ingrates is a type of assassin bug that camouflages itself with bits of carton and preys on hapless workers at the entrance to the nest.

Amphibians

Poison dart frogs ***(Dentrobatidae)*** are brilliantly colored amphibians that are commonly encountered in the humid lowlands on both sides of the country. The reason that they hop around the forest floor so brazenly is that their bright

coloration is meant to warn any potential predator of the poison contained within the frog's skin. Indigenous peoples from several parts of the American tropics discovered this and used the poison to tip their blowgun darts. Usually, the poison was extracted by impaling the unfortunate frog on a stick and subjecting it to the heat of a campfire; this drives the poison to the surface. One species in this family ***(Phylobates terribilis)***, found in the Colombian Amazon, is so toxic that one merely needs to rub the dart on the frog's back to equip it with a lethal dose of poison. There is no record of indigenous people in Costa Rica utilizing the poison dart frogs for this purpose, perhaps because the species found here are not as toxic as those farther south. Nevertheless, they have enough toxins in their skins to protect them from predation.

These frogs are also interesting in that, for amphibians, they display a great degree of parental care. The eggs are laid in moist humus on the forest floor. When the eggs hatch, each tadpole is individually carried on the back of an adult up into the canopy and deposited in a bromeliad containing water, one tadpole to a plant. As if this were not task enough for so small an animal, the females of some species return to each tadpole several times to lay an infertile egg for it to eat.

Another interesting amphibian is the glass frog. There are thirteen species found in the country, but they are all relatively small, translucent green frogs with round pads on the ends of their toes to help them cling to leaves. Put one belly-down on a piece of glass and a startling sight will confront you—you can see many of the animal's internal organs, including its busily beating heart!

Another common amphibian that is often seen congregating around lights in search of insects is the marine or cane toad. These large brown and tan toads eat anything they can stuff into their mouths, but they are not particularly palatable themselves. They have two large poison glands on the top and toward the back of their heads. When squeezed, these glands release a toxic substance powerful enough to kill a hapless dog or cat that has grabbed onto it. When picked up by humans, these toads tend to defend themselves by urinating copiously.

Reptiles

Sea turtles. These are perhaps Costa Rica's most famous reptiles. Four species are found here: the green, hawksbill, olive ridley, and leatherback. The green turtle averages about 80 centimeters in length and weighs between 65 and 120 kilograms. It is found on both coasts but nests mostly from October to March on the Pacific side and July to October on the Atlantic (Tortuguero National Park). The hawksbill is the species that is the source of "tortoiseshell," which has led to its slaughter over the entirety of its range. It feeds largely on sponges and seaweed, and adults range from 65 to 90 centimeters and 35 to 75 kilograms. Hawksbills rarely nest in Costa Rica, but young individuals are commonly encountered by divers on the Pacific coast near Santa Rosa.

The olive ridley is the species that is responsible for the famous ***arribadas*** or ***barricadas***, mass nestings of tens of thousands of individuals, that take place at unpredictable intervals (but usually between September and October) on the Pacific coast. Most famous of these nesting sites is Nancite Beach in Santa Rosa National Park. Olive ridleys are the smallest of all turtle species here, with adults having a shell length between 55 and 75 centimeters and weighing 35 to 45 kilograms.

The leatherback is the largest species and has the most bizarre life history of the lot. Leatherbacks are huge, having a length of up to 250 centimeters and weighing in at 1000 kilograms. Instead of a shell, they are covered with a leathery skin in which small bones are imbedded. Leatherbacks dine almost exclusively on jellyfish and Portuguese man-of-war, and this has created a real problem for them: they sometimes mistake floating plastic garbage for their normal prey and die as a result. These giants come ashore to nest from October to March, with peaks from November to December. One of their most important nesting beaches has been protected as a park, Las Baulas National Park on the Nicoya Peninsula. All species of sea turtles that nest here are threatened or outright endangered due to overhunting, beachside development, and accidental death in trawls. Costa Rican parks and preserves contain areas that are a very important part of worldwide efforts toward sea turtle preservation.

One lizard that is hard to miss while hiking in any of the lowlands is the basilisk or Jesus Christ lizard. Basilisks are large lizards, either brown or green (depending on the species), that get their common name from their ability to run on the surface of the water for short distances. Common or green iguanas are

Black wood turtle, La Selva Protected Zone

considered a delicacy, particularly on the Atlantic side, and there are projects to breed them in captivity to replenish wild stocks. There is some hope that iguanas will help with rain forest conservation; people might have an incentive to save the forest if they can draw protein from it in the form of iguana meat. The ***garrobo*** or ctenosaur is a tan-to-black cousin of the iguana that lives most of its life on the ground. Ctenosaurs are proficient burrowers, and in a few instances roadways have collapsed because they were undermined by burrows dug by females as egg-nesting sites. Ctenosaurs will eat practically anything that is or once was living, including young ctenosaurs. Consequently, the little ones are a bright green color and stay hidden in foliage until old enough to protect themselves.

Snakes. Snakes are not as commonly encountered in the tropics as the old Tarzan movies would have you believe. This is particularly true in deep forest, where there are lots of places to hide, and at higher elevations, where it's hard to keep warm enough to be active. There are 162 species of snakes found here, only twenty-two of which are venomous. Bites from venomous snakes are a greatly overrated hazard; remember that you have a higher statistical probability of being struck by lightning than being bitten by a snake (see Noxious Fauna in Chapter 1, Preparing for Your Trip). Commonly encountered nonvenomous species include the boa constrictor, which reaches a maximum length of about 3 meters and eats everything from birds and reptiles to the occasional dog. Tropical indigo snakes are large, active, tan snakes that are fairly common, particularly in Guanacaste. They are very opportunistic about what they eat, taking everything from fish to rodents and even venomous snakes.

Venomous species include twelve species of pit vipers. Included in this group is the arboreal (dwelling in trees or bushes) eyelash viper, called ***bocoracá*** or ***oropel*** in Spanish. Eyelash vipers come in a variety of colors, from camouflage tan and green to bright lemon yellow. The English common name comes from the raised scales above their eyes.

Also included in this family is a species that is roundly feared by agricultural field workers, the ***fer de lance*** or ***terciopelo.*** This is a large, heavy-bodied species that is quick to strike and is responsible for the majority of bites in the country. Visitors to the parks have little to be concerned about with this species, as it prefers cleared areas with tall grass. Vine snakes are a tan-colored, pencil-thin arboreal species whose fangs are located at the back of the mouth; they feed on small lizards and, though mildly venomous, are no threat to people.

Birds

Costa Rica is justifiably famous for its birds. Studies are still being done, but the list has topped more than 850 species. Of these, 225 are migrants that fly north or south during different seasons but depend on Costa Rica's forests for at least part of the year. This number includes many of the warblers and birds of prey commonly seen in North America from spring through fall. Certainly, this is one of many arguments for the preservation of tropical forests.

Quetzals, magnificent iridescent denizens of the cloud forest, derive their name from the ancient Aztec word for "beautiful" or "precious." Only the males grow the long emerald-colored tail feathers that were once the adornment of Mesoamerican royalty. Quetzals are most easily viewed during the mating season from March to June and into July and early August, when trees of the avocado ***(Lauraceae)*** family come into fruit, drawing the birds into feeding congregations in remnant trees left in places such as the cleared pasture around the Monteverde Preserve. During the rest of the year, when they're not preoccupied with the business of mating or stuffing themselves, they're a lot more difficult to see. While quetzals are usually thought of as a high-elevation species, recent radiotelemetry studies indicate that they migrate altitudinally in search of seasonal food, showing the importance of conserving tracts of land at all elevations.

There are two species of macaws (large birds related to parrots), the scarlet and the great green. Both are becoming rare, but the scarlet macaw is commonly seen in Carara Biological Reserve, Palo Verde National Park, and most notably at the Sirena Field Station in Corcovado National Park. The great green macaw is a shy species that is dependent upon intact forest on the Atlantic slope, a habitat that is becoming increasingly restricted. Both birds also command a high price on the illegal market, and nest raiding is a common cause of their disappearance from areas that still have forest.

Many species of hummingbird are present in Costa Rica, and some of them are very difficult to tell apart, particularly the females. They feed on nectar and occasionally small insects throughout the day to keep up with their metabolism, which is among the highest per weight of any animal. Recently, it was found that many species, particularly those that dwell at high elevations, "hibernate" through the night to conserve energy.

Mammals

Monkeys. Four species of monkeys are found here; howler monkeys are the largest of the four. They travel in groups averaging eleven to eighteen animals, led by the young adult males. The bulk of their diet consists of leaves, with the remainder being fruit and flowers. The deep rumbling growls that the males produce are primarily territorial calls, but they may also function to communicate within the group. The male vocalizations carry for several kilometers, and the uninitiated often mistake the sound for the calls of jaguars.

Spider monkeys get their name from their long, spidery limbs and tail. They live in groups of up to twenty individuals but usually split into smaller groups to forage during the day. They are elegantly graceful while swinging through the treetops. Spider monkeys' tails are totally prehensile, almost like a fifth hand, and can support their entire body weight.

The white-faced or capuchin monkey is not a picky eater and will take fruit, flowers, insects, and bird eggs. The name "capuchin" comes from the animal's white face and chest, which have a vague resemblance to a monk's hood.

The squirrel monkey is the smallest of the four and resides only in the southwest corner of the country. Manuel Antonio National Park is the northern limit of its range. Squirrel monkeys are easily recognized by their small size and distinctive black muzzle surrounded by a white face. They are an endangered

species in Costa Rica due to their dependence on the much-reduced lowland forest on the Pacific side.

Cats. It is a once-in-a-lifetime experience to see a jaguar or ***tigre.*** Jaguars are the largest of the five species of cats found in Costa Rica, reaching a length of more than 2 meters and standing a little over a meter high at the shoulder. They eat anything they can tackle, from sea turtles to tapirs, but they seem uninterested in eating people. They are shy, secretive animals and have become extinct in most of the country. This was not always the case: there is a record of a cattle ranch on Volcán Irazú that closed down in the mid-1800s because of jaguar predation. Jaguars need very large home ranges, and this consigns them to the larger of Costa Rica's protected areas, such as Corcovado and La Amistad National Parks.

The second-largest cat is the puma, often called a mountain lion or cougar in North America. Pumas can be distinguished from jaguars by their unspotted, tan-to-brown fur. The margay or ***tigrillo*** is somewhat larger than a housecat but with a spotted coat. Margays are nocturnal and spend most of their time in trees in primary forest. They seem to be very sensitive to human disturbance and are becoming increasingly rare throughout their range.

The ocelot is usually larger than the margay but is similar in appearance. Its tail is shorter, and it spends most of its time on the ground. Ocelots are active both day and night, and they often hunt on man-made paths. The fifth cat is the odd-looking jaguarundi. These are the most variably colored of all the cats, ranging from reddish to black. At first glance, a jaguarundi looks like a cross between a cat and a weasel, with its short ears, low-slung body, and short legs.

Bats. There are more than 100 species of bats in Costa Rica, and they come in every possible size and shape. The vampire bat is found here but presents little hazard to humans, unless you are in the habit of sleeping outside without a mosquito net in the lowlands. Vampire bats have a complex social life and spend a lot of time grooming each other. The discovery of this has led to a popular way of getting rid of them. This involves capturing a vampire bat and coating it with a poisonous sticky substance; when the others clean it, all are poisoned.

Fishing bats have long, curved talons that they use to hook their prey, which they find by echolocation, even under the water's surface. The false vampire is a huge species with a wingspan of 90 centimeters that hunts sleeping birds at night. Tent-making bats bivouac together under tents of helaconia leaves that they build by carefully biting holes on the spine of the leaf. Other species of bats occupy niches from fruit specialists to insect eaters.

Sloths. Almost everyone who comes to Costa Rica expects to see a sloth. Two species live here, the three-toed and the two-toed. The three-toed sloth is the more commonly seen of the two because it is active during the day, while the two-toed sloth is nocturnal. While they are one of the most common large mammals in tropical forests, they are difficult to see because of their slow movements and natural camouflage, which makes them hard to distinguish from termite nests. They have extremely slow metabolisms and often go to the top of the canopy to bask in the sun long enough to get up to operating temperature. They feed exclusively on leaves and have a highly specialized gut, much like that of a cow, to deal with this hard-to-digest fare. One of the weirdest things about sloths is their toilet habits; they store up urine and feces for a week, descend to the ground, and dig a hole at the base of the tree with their stubby tails. They then defecate, urinate over it, and cover it all with leaves, using their hind feet, before reascending. Why they go through this laborious process that exposes them to predation on the ground is unknown. One theory is that they are fertilizing their favorite food trees, but no one really knows.

Anteaters. These come in two species in Costa Rica. The northern tamandua is commonly seen, most often at night, as it forages for ants, termites, and occasionally bees, ripping into the insects' nests with its stout claws. In fact, the claws are so well developed that tamanduas have to walk on the outside edge of their feet with the claws curved inward. They have no teeth and trap their prey with their long, sticky tongues. The second species of anteater found here is the rarely seen silky or pygmy anteater. These are a striking golden color and are totally arboreal, spending all of their lives off the ground.

Tapirs. Other interesting mammalian oddballs include the Baird's tapir, a distant relative of the rhinoceros. It is the largest native terrestrial mammal in Costa Rica, and adults weigh up to 300 kilograms. These lumbering vegetarians have very poor eyesight and like to live in thick vegetation near water. Baird's tapir is an endangered species, due to overhunting and habitat loss. Tapirs, along with their only natural enemy, the jaguar, need large areas of undisturbed forest within which to live.

Peccaries. The closest relatives of these mammals are pigs, but they don't belong to the same family. Peccaries give birth to one or two young, which are precocial and can follow along with their mothers shortly after birth. In contrast, pigs have large litters of altricial young that are helpless at birth. There are also differences in their dentition and skeletons. One characteristic they share with pigs is that peccaries are not picky eaters; they take fruit, seeds, tubers, small animals, and carrion. There are two species, the collared and the white-lipped. The collared peccary is the smaller of the two and is found in a variety of habitats, including dry scrub, while the white-lipped peccary prefers humid lowland forests. Peccaries' aggressiveness has been greatly exaggerated, but the white-lipped, in particular, has very bad eyesight and will sometimes blunder right past you if you're downwind. You should avoid surprising them, as their "tusks" are large and sharp and even a passing nip could do some damage.

Raccoons. The raccoon family is a diverse group in Costa Rica. The common raccoon's range overlaps that of the crab-eating raccoon. They don't normally encounter each other, as the crab-eating raccoon prefers mangrove swamps. The kinkajou and the olingo share the same niche, both being nocturnal and feeding on fruit and invertebrates high in the treetops. The kinkajou is about twice as large as the olingo and has a prehensile tail. The coati is one of Costa Rica's most frequently seen mammals; wait by a lodge's garbage facility, and you are sure to see one eventually. A coati looks like a raccoon with an elongated snout. Females and young adults travel in groups of up to thirty, but older males frequently leave the group to travel alone.