



Full citation: Evans, Sterling. "A Legacy of Scientific Thought and Tropical Research," "The Environmental Problem," and "The Conservationist Response." Chapters 1-3 in *The Green Republic: A Conservation History of Costa Rica*. Austin: University of Texas Press, 1999.  
<http://www.environmentandsociety.org/node/2699>.

Rights: All rights reserved. Copyright © 1999 by the University of Texas Press

From THE GREEN REPUBLIC: A CONSERVATION HISTORY OF COSTA RICA by Sterling Evans, Copyright © 1999. Courtesy of the University of Texas Press.

Link to the University of Texas Press website featuring the above title:  
<http://www.utexas.edu/utpress/books/evagre.html>

University of Texas Press granted permission for this material to be published in the Environment & Society Portal. This permission does not allow the use of the material in any other edition, or by any other means of reproduction, including (by way of example) motion pictures, sound tapes and compact discs; nor does this permission cover book clubs, translations, digest, abridgement or selections which may be made of the publication.

## **A Legacy of Scientific Thought and Tropical Research**

To those who with effort, caring and dedication from 1841 to 1941 established the basis for biological sciences in our homeland. May their labor be a permanent example for future generations.

Plaque at entrance of the  
University of Costa Rica's School of Biology

Listed with the above message are the names of twenty-three professional biologists (some foreign and some Costa Rican) who have played a profound role in the conservation history of Costa Rica. Part of Costa Rica's uniqueness has been its historic ability to lure a significant number of foreign scientists and to establish a sound training system for local scientists to study and understand the nation's diverse natural history. Mario Boza, one of Costa Rica's leading conservationists, explained that "the diversity and wealth of Costa Rica's flora and fauna, as well as the majesty of its countryside, have attracted the attention of scientists and naturalists from all over the world since the mid-1800s."<sup>1</sup> The legacy of scientific investigation—indeed the drive to understand Costa Rica's biological uniqueness—was important in developing a national appreciation for conserving natural resources. Costa Rican biologist Luis Fournier acknowledged these links when he wrote that "Costa Rican ecological thought developed from the numerous observations about the country's natural history in the past century and early decades of this century by foreign and national naturalists."<sup>2</sup>

Tracing the history of interest in Costa Rican ecology and conservation goes back to the sixteenth century. Fernández de Oviedo, a Spanish naturalist who traveled to colonial Costa Rica in the 1700s, was one of the first to recognize the area's distinct biodiversity and warned against deforestation. But while there were other early decrees and proclamations for forest preservation and soil conservation in the 1770s and 1830s, there was not a base of support for conservation issues in Costa Rica until the final decades of the nineteenth century.

Largely ignored by the colonial government, Costa Rica by the time of independence was one of the poorest and least developed areas of the United Provinces of Central America. After separating from the federation, Costa Rica never had the wherewithal or the population to support higher education. There was virtually no national scientific or professional training. Charles Stansifer shows that by 1845 Costa Rica had no bookstores, hospitals, universities (elementary education was only marginal), research or scientific organizations, or even theaters. He goes on to say that the few scientifically trained persons in Costa Rica at this time were either Guatemalans, Nicaraguans, or Costa Ricans who had studied at foreign schools. A study by Luis Gómez and Jay Savage claims that European naturalists were at first more interested in studying the more geologically wealthy regions of Mexico and Peru because of world fascination with gold and silver. Clearly, Costa Rica's early national years were characterized by what the noted Costa Rican biologist Rafael Lucas Rodríguez has called a "slow development of modest and utilitarian understanding of Nature."<sup>3</sup>

Two events outside of Costa Rica, however, reversed forever the scientific community's disinterest in Costa Rica's tropical ecology: international demand for coffee and speculation of a trans-isthmus canal in lower Central America. Not only did the railroads, built to transport coffee beans to port, open up many unexplored areas of the country, but the coffee trade with Europe brought many foreigners to Costa Rica. Some were scientists who, because of sociopolitical repression and scientific stagnation in their home countries, were excited by the prospect of marketing their services in a new area and by the adventure of visiting a poorly understood biological region. One German scientist who visited Costa Rica in the early 1850s explained that Germany at that time was divided into competitive regional states governed by "reactionary police regime[s]." Thus for many professional researchers, the Americas

“seemed like the place to go.” Schools and fine arts developed more quickly with the advent of foreigners, triggering more communication and travel between Europe and Costa Rica. News of the country’s vast diversity sparked interest for European naturalists to visit, and “those who came usually stayed.”<sup>4</sup>

Toward the end of the nineteenth century, when a growing commercial interest emerged for constructing a Central American canal to connect the Atlantic with the Pacific, attention focused on Nicaragua, Costa Rica, and the Colombian province of Panama. Scientists were drawn to the region to investigate canal site possibilities. Two German naturalists, Moritz Wagner and Karl Scherzer, became enchanted with Costa Rica and stayed to research its natural history. According to one historian of the subject, their writings (especially *Die Republik Costa Rica*) “probably did more to draw European scientists [to Costa Rica] than any other work.”<sup>5</sup>

One such scientist who followed was the Danish botanist Anders Sandre Ørsted, who was the first to publish a detailed description of Costa Rican plants. Others were William More Gabb (from Great Britain), who studied Costa Rican geology, paleontology, and zoology; and Joseph Warscewicz (from Lithuania), who studied horticulture and ornithology and was the first to send bird collections to the most respected natural history museums of the time in Berlin and London. In the 1880s F. Ducane Godman and Osbert Salvin studied in Costa Rica and published their *Biologia Centrali-Americana*, one of the most complete biological works about the region up to that date. The German geologist and naturalist Karl Sapper also conducted investigations in Costa Rica, and the American ornithologist George N. Lawrence was the first to catalogue Costa Rican birds, listing 511 species—two-thirds of all Costa Rican bird species known today. The research of these scientists inspired even greater interest in Costa Rica abroad.

Two other German scholars who went to Costa Rica in the mid-1800s were more influential in the legacy of tropical research. Alexander von Frantzius and Carl Hoffman, both medical doctors, landed in Costa Rica somewhat by chance. Von Frantzius had been advised to move to the tropics to improve his health and Hoffman was intrigued by the adventure of exploring mountains. They both practiced medicine in Costa Rica and in their spare time climbed Poás and Irazú volcanoes, coming to know the ecologies of both mountains intimately and producing major collections of their flora and fauna. Historian Carlos Meléndez claims



that these two German scientists initiated a prodigious era of the study of Costa Rican science.<sup>6</sup>

Alexander von Frantzius was the first scientist to catalogue Costa Rican mammals. He also wrote extensively on the native tropical plant life and through his botanical explorations and publications “made Costa Rica known to the scholarly world.” He also produced the first academic work on Costa Rican climatology. Carl Hoffman, although far less published than von Frantzius (he only published three important articles on volcanoes), did become known for his taxonomy of Costa Rican plant and animal species (of which twelve bear his name today) and also sent impressive collections to Berlin. Hoffman served as an army surgeon for the Costa Rican forces in the battle against American filibuster William Walker in 1856. While in Guanacaste province in northwestern Costa Rica, he noted the unusual diversity of bats, which he collected and studied. His work in this area became the first scientific research of bats in Costa Rica.

Bringing new information to the scientific community, however, was not von Frantzius’ most pronounced mark on Costa Rican ecological research; teaching natural history to Costa Ricans was. Later in life, von Frantzius opened a pharmacy, the back room of which was used as a laboratory and meeting place for students. Three such Costa Rican students, José Zeledón, Anastasio Alfaro, and J. F. Tristán (known as the “drugstore gang”), became close assistants, accomplished biologists, and early leaders in the effort to research tropical issues and educate others.

An important step in Costa Rica’s favor—and a move that was unwittingly conservationist—was the government’s spirited attempt in the mid-nineteenth century to improve the educational system. The University of Santo Tomás was founded in 1844 as a way to attract scholars and to educate professionals. But lacking enough local teachers and scientists, the government decided to recruit European educators to teach Costa Ricans.<sup>7</sup> The administrations of Jesús Jiménez and Tomás Guardia in the 1860s and 1870s invited many German and Swiss teachers. Many foreigners who came, however, left after short stays when they discovered that they were expected to spend more time teaching than doing research. One who stayed was Helmuth Polakowski, who became an expert in tropical botany.

The University of Santo Tomás was abolished in 1888 by President

Bernardo Soto. His influential and politically powerful minister of public instruction, Mauro Fernández, believed that no university could succeed without a strong secondary school system in place. He was actively involved in starting the challenging school Liceo de Costa Rica, changing education by making it sponsored by the state instead of by the church, enacting legislation to make education compulsory to the seventh grade, opening up high schools to women, and beginning an even stronger push to attract foreign teachers. Several more Swiss scholars accepted the challenge. One, Henri Pittier, was another individual who was destined to change the course of the country's biological thought and to begin what has been called the "golden age of Costa Rican natural history." Described as "determined, indefatigable and tyrannical," Henri Pittier had a bold "multidisciplinary approach to field biology." To acquaint himself seriously with the country, he climbed every volcano more than once, lived with different indigenous peoples, and collected as many specimens as he could to "amass a body of information unsurpassed to that date." He was intrigued and captivated by Costa Rica's biodiversity, calling the country the "botanical and zoological emporium of the continent."<sup>8</sup>

Pittier branched out from the confines of his own research to organize the National Agricultural Society and to create the National Observatory. He also recruited many other scientists to study in Costa Rica and with their help developed the largest herbarium in Latin America at the time. More important, he founded and succeeded in acquiring government funding for the Physical Geographic Institute (IFG, called the National Geographic Institute after 1914). This institute, soon to become one of the leaders of its kind in Latin America, was in charge of collecting biological data, managing the herbarium, recording all meteorological information, researching national agricultural problems, and, perhaps most important, accurately mapping the republic. All of these successes, unheard of in much of the rest of Latin America, created a national base to encourage scientific thought and to spur others to pursue research topics in Costa Rican natural history.<sup>9</sup>

Disagreeing with the government's 1904 decision to place the IFG under the auspices of the National Museum, Pittier moved to the United States and accepted employment with the U.S. Department of Agriculture. Capable scientists like Adolphe Tonduz, Carlos Wirklé, and George

Cherrie carried on Pittier's work in Costa Rica, and Anastasio Alfaro (one of von Frantzius' "drugstore gang") became the director of the museum and the IFG.

The National Museum, then, became the focus for scientific research. Alfaro, only twenty-two years old at the time he was appointed director, had the able help of José Zeledón. Zeledón was sent to study at the Smithsonian Institution in Washington, D.C., and established important liaisons with American scientists.

With these connections, the floodgates were now open for U.S. researchers to start pouring in to Costa Rica—a flow that never waned. Some of these biologists included Edward Cope and Edward Taylor in herpetology, and Philip and Amelia Calvert in entomology. The Calverts, who were primarily interested in studying the life histories of tropical dragonflies, traveled around Costa Rica for a year (May 1909 to May 1910) and ended up writing a comprehensive field biology study entitled *A Year of Costa Rican Natural History*. Concerned about what "transformations" in the land would occur in Costa Rica due to the Panama Canal (influx of people, more transportation, etc.), the Calverts wrote that the book's mission was to "leave for the future a picture of what the past contained." To do so, they studied with and received valuable local assistance from such scientists as Adolphe Tonduz, Henri Pittier, J. F. Tristán, C. H. Lankester, and José Zeledón and acknowledged the "liberal and enlightened Costa Rican government" for its recognition of the importance of studying tropical sciences. The government's attitude, coupled with Costa Rica's "high mountains, rushing rivers, great variety of climate and of natural products," they wrote, made "such wonderful inducements for naturalists and entomologists."<sup>10</sup> Swiss biologist Paul Biolley also made important contributions in entomology and malacology in these years. By 1914 Costa Rica had become the center of scientific research in tropical America.

Attracted to such a place in the 1930s was American botanist (and later ornithologist) Alexander Skutch. Skutch arrived in Costa Rica to extend his dissertation research on the leaves of banana plants but ended up staying for the next sixty years. In that time he homesteaded a small farm in El General Valley, meticulously studied the life histories of a variety of tropical birds, and researched many different plants. His work resulted in over 200 journal articles and a dozen books on topics ranging from ornithology and botany to tropical conservation and philosophy. Summing

up why he and many others in his field were so enchanted with Costa Rica, and why he stayed for so many years, Skutch wrote that "in the mid-1930s Costa Rica was still largely unspoiled. Its population of less than half a million people was concentrated in the narrow Meseta Central. . . . Other advantages . . . were its political stability and the friendliness of its people. . . . Thus the naturalist working in some remote spot was not likely to have his studies suddenly interrupted or his thin lines of communication cut by a violent upheaval, as has happened to many in Latin America."<sup>11</sup>

Without a university or even an agricultural school (until 1926) to support professional research efforts, however, the period from the 1920s to the 1950s witnessed a decline in Costa Rican scientific study. Because field research was viewed by many as a pastime for the eccentric or the rich, few Costa Ricans became involved. An attempt in the 1920s to reopen a university hindered rather than helped these efforts because of a lack of trained faculty in the biological sciences. When the University of Costa Rica was finally established in the 1940s, the National Museum was placed under its direction; as a result of poor management, many of the specimen collections of earlier scientists were ruined.

Despite these setbacks, progress occurred with the establishment of the National School of Agriculture in 1926. Staffed with people like José Orozco (a silviculturist who urged forest protection), José Arias (who developed an early conservation plan), and Rafael Chavarría (a conservationist-minded director), the school became instrumental in teaching farmers the proper use of controlled burning, prevention of erosion, and other soil conservation techniques. Luis Fournier writes that the School of Agriculture went on to play "a great role in helping form conservationist thought." One instructor there, Enrique Jiménez (educated in Belgium), taught with an awareness of environmental problems, later became Costa Rica's secretary of agriculture, and was instrumental in the passage of the *Ley de Quemados* (a law regulating controlled burns) to protect the forests.<sup>12</sup>

Progress also occurred in the 1930s and 1940s through the work of two exceptionally bright Costa Rican scientists: Alberto Manuel Brenes Mora and Clodomiro Picado Twilight. Brenes, from San Ramón and educated at the Liceo de Costa Rica and at universities in Paris, Lausanne, and Geneva, became one of the country's most noted botanists. From 1902 to 1948 he was an active instructor at various San José schools and was an

## 22 Costa Rica's History of Conservation

avid specimen collector. He discovered and wrote on many new species of plants and came to specialize in orchids. The *Brenesia* orchid was named in his honor by European taxonomists. He ended his long academic career as head of the National Museum's botanical section, maintaining a herbarium with thousands of specimens. Picado, educated at the Sorbonne, returned to his homeland to concentrate on the study of Costa Rican natural resources. He published hundreds of scientific articles, pioneered research on bromeliads, and wrote *The Poisonous Snakes of Costa Rica*. He has been called the "first Costa Rican academic biologist."<sup>13</sup> Unfortunately, Picado died at an early age in 1944 and never lived to be a part of the University of Costa Rica (UCR). His statue, however, graces the front lawn of the School of Biology at UCR as an inspiration to future biologists.

But while Picado conducted independent research and efforts of the National School of Agriculture centered primarily on conservationist farming practices, a professional outlet for scientific study and a center to train others in tropical research was still lacking. This changed in the 1950s with the expansion of UCR. In the early fifties Antonio Balli (an Italian biologist) and Rafael Lucas Rodríguez Caballero (a Costa Rican educated at the University of California) organized the biology department at UCR. Rodríguez, whom Luis Fournier has called a man with "great vision for the future," published a forward-looking work on areas in Costa Rica that he believed required protection.<sup>14</sup> He was also instrumental in working to have the biology department changed to become the School of Biology, a separate division at the university, in 1955. A full-time staff of professional biologists was hired, and Archie F. Carr, a herpetologist at the University of Florida, designed the curriculum. Carr spent years studying and lobbying for the protection of the green sea turtle (*Chelonia mydas*) that lays eggs on Costa Rica's northeast coast. The School of Biology became one of the best of its kind in Central America and has served as a springboard for research into tropical studies for Costa Rican and other Latin American students. It was dedicated to Dr. Rodríguez in 1979. A national wildlife refuge, established in Guanacaste province in 1977, also bears his name.

Another influential faculty member of UCR's School of Biology was Alexander Skutch, who taught there for many years. Increasingly over time, Skutch's beliefs in natural history and ecological harmony evolved into conservation advocacy. He decried how man "covers larger areas

with his highways and constructions, destroys thriving forests to make cultivated fields and pastures for his beef cattle, contributes to the spread of deserts by over-exploiting arid lands, and poisons seas with his wastes.”<sup>15</sup>

For Skutch, the study of natural history, tropical ecology, and conservation complemented his beliefs in *ajimsa* yoga regarding the sanctity of all life and the preservation of a harmonious balance of nature. According to Fournier, this “very special philosophy toward nature, of great significance from a conservationist point of view, without doubt influenced the [conservation] movement in Costa Rica.”<sup>16</sup>

The University of Costa Rica is important in Costa Rica’s conservation history in other ways. The National School of Agriculture (changed to the School of Agronomy) became a division of UCR and continued its instruction of conservation values. The Costa Rican zoologist Alvaro Wille (educated at the University of Kansas) developed the entomology section there, which likewise has become a valued, regional center for tropical issues.<sup>17</sup> UCR’s law school also became actively involved in environmental policy through its Center for the Study of National Problems.

The momentum continued with the development of organizations promoting conservation issues in Costa Rica. In 1942 the Inter American Institute for Agricultural Sciences (IICA) was founded in Turrialba by the Organization of American States (OAS). It specialized in training individuals in agricultural sciences, forest conservation, and wildlife management. In 1972 the institute’s board members voted to end affiliation with the OAS and to form an independent research and training organization with the new name CATIE—Centro Agronómico Tropical de Investigación y Enseñanza (Tropical Agronomical Research and Higher Education Center). It is headquartered in a campuslike facility with modern laboratories, classrooms, and library just outside of the city of Turrialba. CATIE has sponsored a wide variety of tropical agricultural programs over the years and has attracted a great number of national and international scientists and students to study sustainable tropical agronomy and forestry.

Dr. Leslie Holdridge, one of the early and most instrumental leaders at CATIE, was an instructor there for many years. He believed in rainforest preservation and later purchased a heavily forested tract of land (“La Selva”) in the north-central part of the country that he used for more intensive study of tropical lowland systems. Moving to CATIE in 1952 to

## 24 Costa Rica's History of Conservation

study under Holdridge's direction and to earn his master's degree in science was a Venezuelan graduate student named Gerardo Budowski. Budowski, who went on to Yale to pursue a doctorate in forestry, has used his knowledge of tropical ecosystems to promote conservation both in his adopted country of Costa Rica and in a variety of positions abroad. He became a CATIE instructor and later its director general, a scientist at UNESCO in Paris (where he organized the 1968 World Biosphere Conference), and for six years was the director general of the International Union for the Conservation of Nature (IUCN) in Switzerland. He is currently on the international board of trustees of the World Wildlife Fund, president of the World Ecotourism Society, director of natural resources at the University for Peace in Costa Rica, and still maintains ties with his "beloved" CATIE as senior advisor to the director general.<sup>18</sup>

In 1966 CATIE initiated a course on national parks and wildlife under the direction of Dr. Kenton Miller, a biologist from the United States who likewise came to appreciate very deeply Costa Rica's tropical environment and potential for conservation. He taught there for several years and later became an international authority on national park development. One of his CATIE students in the late 1960s was a Costa Rican named Mario Boza, who went on to spearhead the country's national park program. Boza had recently graduated from UCR with a degree in agronomy and had wanted to study teakwood production at CATIE.

Heeding the advice of his instructor Gerardo Budowski, however, he got involved with Kenton Miller's national parks course, wrote a master's thesis on the development and management of a national park at Poás Volcano, and has been in the forefront of Costa Rica's conservation program ever since. He became the nation's first director of its fledgling national park service, natural resources advisor to President Rodrigo Carazo, university professor, founder and director of the conservation organization Fundación de Parques Nacionales, author of several books on Costa Rica's national parks, assistant director of the Ministry of Natural Resources, and currently is head of the Mesoamerican Biological Corridor Foundation, whose aim is to link conservation areas throughout Central America.

Through people like Leslie Holdridge, Gerardo Budowski, and Mario Boza, CATIE has actively influenced the scientific and conservation leadership of Costa Rica for over five decades and has had an impact on conservation in other tropical countries. In 1982 Craig McFarland, CATIE's

director of the Wildlife and Watershed Program, conducted a survey to inventory the conservation strategies of other Third World nations (i.e., their national parks, provincial or state parks, national forests, biological reserves, watershed conservation, management plans, legislation, finances) to serve as a base data pool to improve CATIE's ability to understand the conservation needs in other nations.<sup>19</sup> Likewise, the center continues to attract many foreign students each year.

There have been other private sources of conservation in Costa Rica that have played large roles in the country's legacy of scientific thought. In the early 1950s American Quakers from Alabama, fleeing a militaristic U.S. government involved with the Korean conflict, were attracted to Costa Rica because of its abolition of the army and looked for a place to settle. They chose an area near Monteverde in north-central Costa Rica to practice low-technology agriculture and dairy farming. Much of the surrounding area had been deforested by local farmers, but the Quakers, under the leadership of Wilford Guindon, recognized the need to preserve forests on the mountainsides to protect the region's important watersheds. To that end they established an 800-acre reserve in a pristine montane environment that abutted their farms. Today the area is part of the Monteverde Cloud Forest Preserve, which protects habitat for many endangered species, including the well known resplendent quetzal (*Pharomacrus mocinno*).

In 1959 Archie Carr was influential in helping to found the Brotherhood of the Green Turtle and its subsidiary, the Caribbean Conservation Corporation (CCC), the first nongovernmental conservation organization in Costa Rica. Because of uncontrolled commercial turtle and turtle egg hunting, numbers of the giant reptiles had dropped to dangerously low levels and were threatened with extinction. Carr understood the urgency of the situation and the CCC set out to research the ecology of the turtle and to advocate protection of its most important nesting habitat at Tortuguero (meaning "place of the turtle") on Costa Rica's northern Caribbean coast. The organization's work culminated with the establishment of a protected area for turtles in 1970 that was enlarged into a national park (with carefully monitored visitation policies) in 1975. It continues to research, track, and count green turtle populations and has branched out into other regional conservation campaigns.

Dr. Carr's sons, Archie III and David—both of whom have spent considerable time conducting research on tropical conservation in Costa



Rica—are now at the helm of the CCC. They, along with Mario Boza and James Barborak (a U.S. biologist who started coming to Costa Rica in the 1970s as a conservation consultant) are leading the efforts of the Mesoamerican Biological Corridor, also known as the Paseo Pantera, or “Path of the Panther,” project. A joint effort with Wildlife Conservation International (a division of the New York Zoological Society), it seeks to halt the fragmentation of biologically diverse habitats in a 1,500-mile greenbelt ranging from southern Mexico to Panama. Working to connect conservation areas with ecosystem corridors, however, also provides protection for important watersheds in the region—vital sources for water and flood control for thousands of Central Americans.<sup>20</sup>

Another organization, the Tropical Science Center (TSC), has also played an active role in Costa Rican conservation. TSC is a private consulting firm that was established in 1962 by three American biologists—Leslie Holdridge, Robert Hunter (a forester and land-use specialist), and Joseph Tosi (an agricultural scientist). TSC has assisted the IICA (CATIE) with many projects, developed a biological station at Rincón de Osa, organized conferences and training sessions, and worked for the creation of private biological reserves for field research and education.

TSC has left its largest mark in Costa Rican conservation history through its efforts to preserve the Monteverde Cloud Forest Preserve. TSC's connection to the Quakers' watershed conservation program stems from the work in the early 1970s of an ornithology graduate student from the United States named George Powell and his scientist wife Harriet Powell. The Powells were conducting dissertation research on birds of the Tilarán Mountains where they were “astounded” by the “extraordinary biological richness of the cloud forest” and “alarmed” by the threat posed to the area by hunters, land speculators, and squatters. In 1972 George Powell approached TSC for advice on establishing a nonprofit association to enable him to apply for and receive grants for purchasing and protecting the area. “We were immediately interested,” Tosi explains, and after visits with Powell to the area “we were in agreement that the area warranted full protection.” Over the next few years Powell and TSC set up the fund, received hundreds of thousands of dollars from international conservation organizations to acquire the land, and expanded the area into a 10,000-acre preserve. TSC became its managing agent and Powell served several years as its director.<sup>21</sup>

Today the Monteverde Preserve is one of the best-known parks in

Costa Rica. With the help of TSC and its offspring organization, the Monteverde Conservation League (in Canada), the preserve is now over 27,000 acres and continues to expand. Expansion has meant that squatters who moved onto the land to farm in the 1970s and 1980s had to move. The Monteverde Conservation League and the World Wildlife Fund raised funds to help offset the cost of relocating and resettling them by "selling" tracts of land to donors for twenty-five dollars an acre.<sup>22</sup>

In the early 1980s a TSC study group created a recommendation for Costa Rica's National Park Service to develop the Tilarán Mountain area into a national park that would include the Monteverde Preserve. While this recommendation was denied in 1981 due to "a lack of money to pay the numerous occupants" and landholders in the region, it remains a private nature reserve and open to the public. In 1995 over 50,000 people visited Monteverde despite the slow, rough mountain roads leading there. Plans to improve the roads were discussed but abandoned by TSC as a measure to limit tourist access and prevent overburdening the fragile mountain environment. Dr. Tosi boasts that Monteverde remains today as "one of the most efficient, well organized, and exemplary private reserves of its kind in the world." Its relatively small area is home to more than 2,500 species of plants, 100 species of mammals, 120 species of reptiles and amphibians, 400 species of birds, and tens of thousands of insect species.<sup>23</sup>

A spin-off of the Monteverde conservation strategy was the establishment of the Children's Rain Forest Preserve. Adjacent to Monteverde, this protected area is the result of a Swedish teacher's efforts to save unprotected areas surrounding the preserve that she observed were seriously threatened when she visited the site in the late 1980s. She returned to Sweden with these concerns and enlisted the help of her nine-year-old students. They started a fundraising drive to purchase thirty-five acres next to the preserve. The idea soon spread to other parts of Sweden and Europe, Great Britain, Canada, the United States, and Japan. Through the efforts of schoolchildren across the world, then, more than 17,500 acres are now protected and similar measures have started in other parts of the world. Joseph Franke has written that the program's success is "an example of how important conservation ideas often start small but have far-reaching effects."<sup>24</sup>

By the early 1960s research and instruction on tropical ecology were increasing in the United States. Scholars from six leading universities in

## 28 Costa Rica's History of Conservation

this field (Michigan, Florida, Miami, Kansas, Harvard, and Washington) saw the need to consolidate efforts to develop a research field station in the tropics. Costa Rica was chosen as the site because of the number and proximity of its geographic zones, its broad biological diversity, and its politically stable government. In 1963 the consortium of these schools plus UCR formed the Organization for Tropical Studies (OTS). Its mission was “to provide leadership in education, research, and the wise use of natural resources in the tropics.”<sup>25</sup>

The OTS has been accused of suffering from so-called “scientific imperialism” in its early years of existence. This “big stick” or “missionary” attitude was manifest in the fact that some U.S. and European scientists went to Costa Rica to show the locals what to do and how to perform research in their own country. Soon, however, OTS personnel learned to cooperate with the host government and have since included Costa Rican and other Latin American students and instructors in all research endeavors. Over the years more than 700 papers have been generated by OTS research, and many ecologists trained there have gone on to work for conservation issues or have become teachers themselves. It has been said that “almost every major figure in tropical biology today” has been associated with the OTS.<sup>26</sup>

These OTS instructors and students have made a profound impact on the conservation history of Costa Rica and other tropical places. Early OTS directors who had an innovative environmental vision for tropical education were Norman Scott and Donald Stone. Daniel Janzen, one of the first OTS students and later an instructor there, moved to Costa Rica and has spent much of his life researching and working to protect the tropical dry forest environment in Guanacaste. Another shining example of an OTS product is Rodrigo Gámez, a plant virologist, former molecular biology professor at UCR, and past natural resources advisor to President Oscar Arias. Gámez, an OTS board member in the early 1990s and currently director of Costa Rica's National Biodiversity Institute, stated, “My association with the OTS helped open my eyes to the importance of biological diversity, particularly for a country like Costa Rica. From trying to figure out what all those *gringos* [were] doing down there, many Costa Ricans have developed a greater appreciation of the nation's biological wealth. The OTS has played a crucial role in providing credibility for conservation.”<sup>27</sup>

A big boost to the organization occurred in 1968 when Leslie Holdridge sold his property known as “La Selva” to the OTS. La Selva was an island in an area subjected to increasing timber and cattle pressures near Puerto Viejo in northeastern Costa Rica. It became the OTS’s biological station and center of tropical research. While only four and a half square miles in size, La Selva has half as many species as all of California, including 320 species of trees, 394 species of birds, 143 species of butterflies, 122 species of reptiles and amphibians, 104 species of mammals, and 42 species of fishes.<sup>28</sup>

In the 1980s La Selva was expanded to border Braulio Carillo National Park (the combination of which has been identified by UNESCO as a World Biosphere Reserve). The expansion ensured the seasonal migration of species within the different parts of the ecosystem, an activity that was being seriously threatened by increased logging and cattle grazing in the region. Along with international conservation and philanthropic organizations, the OTS actively participated in the campaign for the expansion, which resulted in the creation of a *zona protectora* by the Costa Rican government. Rodrigo Gámez stressed the importance of such a zone when he wrote, “We cannot put fences around the parks and reserves and forget about what happens outside them.”<sup>29</sup>

The creation of the *zona protectora* attracted even more local and international scientists to La Selva. Research usage increased fourfold, with the number of individual researchers there increasing by 257 percent in just six years. Laboratory and lodging facilities expanded, and by 1990 an average of twenty researchers a day were studying at La Selva. Fully half of all OTS usage is by Costa Rican biologists and students, and Costa Ricans are on the staff of every OTS project. Likewise, the OTS has provided its services to its host country on many occasions. In 1983, for example, Harvard biologist Charles Schnell sponsored an OTS biological inventorying project for the newly created Chirripó National Park.<sup>30</sup>

The OTS maintains two other biological field stations besides the one at La Selva. One is in Guanacaste near Palo Verde National Park and is used by biologists studying tropical wetlands ecology. The other is at Las Cruces, Coto Brus (near the village of San Vito)—a tropical forest setting in extreme southern Costa Rica. Las Cruces was started by Florida horticulturists Robert and Catherine Wilson, who moved to Costa Rica in 1963 to try their luck in tea and coffee farming. When those ventures did

not pan out, the Wilsons decided to start a botanical garden as a way of leaving a tropical legacy for future generations to enjoy. After a series of setbacks and failures and having nearly exhausted their own financial resources, they looked to the emerging OTS for help. In 1973 they donated the twenty-five-acre botanical garden to the OTS, but Robert Wilson maintained control of it. Darryl Cole-Christensen, a resident of the area at the time, explained that "the first years of OTS custody were characterized by apparent failure of the garden. Everywhere there was evidence of collapse, greenhouses literally falling down, weed encroachment . . . every evidence of the imminent end of the dream."<sup>31</sup>

But the Wilsons and OTS continued their work and turned the garden into a successful venture, "a fine achievement of tenacity and commitment," as Cole-Christensen related. Due to Robert Wilson's failing health, the OTS assumed full maintenance of the garden in 1986. Surrounded by a 342-acre forest reserve, it has since served as a center for botanical, agro-ecological, and horticultural research and is used for scientific training and public education. Regional plant species that are threatened with habitat loss and extinction are preserved there for future reforestation projects. Besides tropical palms, bromeliads, ferns, heliconias, marantas, and many other plants, the Wilson Garden is home to hundreds of species of birds and other animals. Trails through the rain forest are also open to visitors. It is managed today by biologists and long-time proponents of Costa Rican conservation efforts Luis Diego Gómez and Gail Hewson.<sup>32</sup>

Today the OTS, as a whole, is a consortium of fifty-two U.S. and Costa Rican universities. The mutual advantages of its being located in Costa Rica were summed up by current OTS co-director David Clark: "The most important of OTS' experiences . . . is the long history of positive relations it has enjoyed with its host country . . . from the ease in which research permits can be obtained to the willingness of talented Costa Rican biologists to collaborate in joint projects. . . . For its part, Costa Rica has benefited ecologically, educationally, and scientifically from the relationship."<sup>33</sup>

Other important figures in Costa Rican conservation history emerged in the 1960s and 1970s. Biologists like Luis Fournier, Sergio Salas, Gary Stiles, W. L. Ramírez, and Alexander Bonilla all represent part of the result of Costa Rica's scientific legacy. Others advocated conservation

and changes in policies by becoming involved in government agencies. Scientists like Mario Boza, Rodrigo Zeledón, Carlos Quesada, Alvaro Ugalde, Rolando Mendoza, and Tobías Ocampo are among those who represent Costa Rica's emphasis on science. Much of the work of these scientists was financed through CONICIT (Consejo Nacional de Investigaciones Científicas y Tecnológicas), which is similar to the National Science Foundation in the United States. Established by the government in 1973, CONICIT has assisted scientists by funding both large- and small-scale programs. The government's support of CONICIT is another reflection of the nation's understanding of the importance of scientific inquiry.

While the percentage of Costa Ricans who are scientists is small (and of those, the percentage of field biologists even smaller—which is typical of most, if not all, countries of the world), interest is there, numbers are growing, and a strong educational system is in place to foster scientific thought and conservationist policies well into the future. The Gómez and Savage study concludes that Costa Rica now has a cadre of biologists whose orientations have been shaped by the new theoretical ecology, the ecological movement, and the stimulus of the OTS. Through their efforts, Costa Rica has a solid scientific base in its CONICIT, its universities, and the National Museum.<sup>34</sup>

Knowing as much as possible about the natural environment, how ecosystems are interrelated, and how they affect humans (as well as how we affect nature) is the key to understanding why and how to protect it. The beginning of this understanding, notes Gerardo Budowski, was the country's physical geography itself—"forests and volcanoes" and later "a friendly, democratic republic" that made Costa Rica an enticing destination for foreign scientists.<sup>35</sup> Calling it the "sweat equity donated by hundreds of scientists and volunteers," a 1995 report summed up this sentiment: "When conducting experiments, donor agencies and scientists want to reduce risks and variables. Costa Rica has the advantage. . . . Conservation is hard enough under the best of circumstances. Who wouldn't choose to work in a country where there is an abundance of habitats, experts, laboratories, libraries, institutions, and communications facilities that can contribute to the success of a project? Perhaps more important, one can start a lengthy project here, work in relative security, and know that a coup, famine, or government expropriation won't rub out years of data."<sup>36</sup> But if the number of Costa Ricans with advanced degrees

## **32 Costa Rica's History of Conservation**

in the biological sciences is small, the number of Costa Ricans who support conservation is large. Most may not actively lobby for ecological issues, but many do support the causes that will preserve their natural heritage. This support is rooted in the legacy of Costa Rica's emphasis on tropical science and is manifested in society today.

## **The Environmental Problem**

From the beginning of humanity, man has maintained a close contact with nature and has obtained from it the necessary resources for his subsistence.

Luis Fournier Origgí, *Recursos naturales*

### **The Historical Setting of Deforestation**

The point at which dependence on the natural environment becomes exploitation of the natural environment is the problem addressed in this chapter. Today a large percentage of Costa Rica is deforested and suffers from erosion and habitat loss for many species of flora and fauna, including a large number of endemic species (ones native to that area and not found elsewhere). Exactly how this scenario unfolded deserves careful, historical study to understand the dilemma and Costa Rica's responses to it.

Costa Rica's unique geography forged a distinct land-use pattern for native people and European settlers. Some anthropologists have argued that indigenous people who inhabited Costa Rica for at least 10,000 years before the arrival of Spaniards did little to deteriorate the natural environment.<sup>1</sup> Indians recognized the areas where not much would grow and did little to alter that land's condition. In fact, Indians primarily developed agriculture in only four of Costa Rica's twelve life zones and limited cultivation to such local crops as yuca (manioc), chilies, tomatoes, beans,



corn, avocados, *pejibayes*, and other native fruits and vegetables. Likewise, they fished, hunted native animals, and gathered wild fruits and nuts. Carolyn Hall explains that "Indians exploited the natural environment while simultaneously conserving its potential resources."<sup>2</sup>

In order to conserve, the Indians learned resource management techniques. They cleared forests by burning small parcels (a practice referred to as swidden agriculture) and, to guard against erosion during the rainy season, seeded the areas with various plants to provide a permanent cover. Their small, stable population necessitated subsistence farming only—producing enough food for the family or basic community units. One study that compared archaeological evidence to present-day indigenous activities concludes that "it might seem like a paradox that we consider the Indians as conservers of their environment because it was precisely from their system that we inherited the custom of burning terrain and even the practice of hunting, fishing, and gathering, or in other words, a production economy that is also extractive and exploitative."<sup>3</sup>

The Spanish agricultural experience in Costa Rica, however, was exploitative in a different way. Early settlers not only gathered and cultivated native products but soon introduced such European commodities as sugar cane, citrus fruits, cereal grains, and livestock—what Carolyn Hall terms "ecological colonialism" and Alfred Crosby calls "the Europeanization" of the flora and fauna. Crosby includes Costa Rica in his list of "NeoEuropes" that were characterized by "biological expansion" or "ecological imperialism" in colonized parts of the world. Put in another way, as a different study suggests, the Europeanization process can be defined as "an amalgam of what they [the settlers] discovered, what they introduced, and what they fashioned for themselves."<sup>4</sup>

Because the colonizers considered Indian ways inferior (less productive) to European agriculture, they initiated a slow, continuous deforestation process. The lands became dedicated to livestock grazing and to the cultivation of introduced crops, which disrupted the indigenous way of life in those regions. The comparatively few resident Indians in Costa Rica were not used as slaves nearly to the extent that they were in the more mineral-rich parts of the Spanish New World. Instead, they were pushed out of areas the European settlers wanted, or captured and sold as slaves for other parts of the Spanish Empire. Their "empirical knowledge of ecologically appropriate" agriculture, as Hall has described it, was ig-

nored by whites and relegated to the small group of Indians isolated from colonial settlements.<sup>5</sup>

Environmental impact during the colonial era, however, remained limited due to Costa Rica's relative isolation and low population. While colonial farming practices were inappropriate for tropical environments, the crops produced were foodstuffs for a small colonial population at home or tobacco and cacao for local and regional markets. Early colonial agriculture (limited to the Central Valley) had relatively little impact on the land.

Everything changed in the late 1830s when coffee was found to thrive in some of Costa Rica's climatic zones. Many thousands of acres in sloped, cool terrain were cleared for coffee cultivation. What developed for Costa Rica was an agricultural export commodity with subsequent growth ramifications. The emergence of a coffee elite class meant that large landholders dominated the coffee industry and an agro-export oligarchy of merchant elites controlled the trade of coffee to foreign markets. Both groups came to dominate politics competitively and advocated increased production. Unlike many parts of newly independent Latin America, however, this trade was controlled by local Costa Ricans and not by foreign interests. As demand increased, the elite were motivated to turn more and more acres of previously undisturbed forest into coffee fields. Since 1845 (the beginning of the coffee trade with Great Britain), the government of Costa Rica provided further incentives for these efforts through lucrative tax breaks to the growers. For more than forty years thereafter coffee was virtually Costa Rica's only export product.

But in Costa Rica an incipient conservation awareness was already starting to emerge. Not all farms were large landholdings, but small or large, as Luis Fournier notes, the scale of agricultural deforestation in those years had "little marked effect on the environment." The Spanish and Costa Rican growers had "enough ecological sense to settle in regions where the soil and climate were sufficiently satisfactory for agricultural activities."<sup>6</sup>

Likewise there were early calls for conservation. As far back as 1775 the Spanish governor of Costa Rica, Juan Fernández de Bobadilla, issued a proclamation to discourage controlled burns on the basis that too much land was being cleared and causing soil sterility. In 1833 and 1846 there were decrees regarding forest preservation (the latter pertaining to

forest cover near cities). In 1888 a decree to protect watershed areas in mountains was announced, and by the early twentieth century there were calls for a national forestry code. Hunting laws were enacted by 1853 as a means to conserve wildlife. And, very important, a further deterrent to environmental degradation was Costa Rica's low population, which in the early years of statehood was less than one person per square mile.<sup>7</sup>

On the other hand, the advent of the banana industry toward the end of the nineteenth century and first few decades of the twentieth signaled an even greater agro-export phenomenon with greater environmental consequences. Unlike coffee, banana plants grow in low, humid zones, can be harvested year round, and are less susceptible to yield variations. For these reasons, and because there was a robust market in the relatively nearby United States, bananas were introduced into Costa Rica's Caribbean lowlands in the late 1870s. They thrived there and came to dominate the agricultural landscape of lowland Costa Rica.

A major difference between the two industries is that banana production requires a large, capital-intensive labor and transportation infrastructure. This discouraged small farmers from entering the banana business and opened the door to foreign multinational corporations. Such was the case in Costa Rica, where the United Fruit Company came to monopolize the banana scene. Boston businessman Minor C. Keith completed the International Railroad of Central America and helped found United Fruit in 1898 as a means of bringing bananas to a rapidly growing U.S. market. But because absentee landowners have significantly less contact with the land and are more interested in a good return on their investment than in ecologically sensible agriculture, the banana industry became damaging to the Costa Rican environment.

Banana growers (*bananeros*) practiced continual forest removal to raise banana plants since a banana field's productive life is limited to seven years. More destructive were Sigatoka and Panama disease (caused by the soil fungus *Fusarium oxysporum*), which rendered banana fields infertile and caused the *bananeros* to clear more forest for plantations. The diseases forced United Fruit to abandon most of its Caribbean lowland banana fields by 1940 and move operations to the Pacific Coast near the town of Golfito. United Fruit records show that from 1900 to 1965, nearly 185,000 acres of forest were cleared for bananas. From 1966 to 1990, however, the pace of deforestation greatly quickened with esti-

mates as high as 153,000 acres *a year*—representing up to 11 percent of Costa Rica’s annual deforestation. Some 96,000 acres (10 percent of which was primary forest) were cleared for banana plants in the six-year period from 1986 to 1992 alone.<sup>8</sup>

Clearing land for banana fields, however, is only part of the banana deforestation picture. Where before there were cart roads, railroads—on the Atlantic side by 1890 and on the Pacific side by 1930—were constructed to haul bananas to port and opened up new areas to developers. Cattle ranches were needed to feed the growing number of plantation workers. And when plantations were abandoned, like the ones near Limón by 1940 and near Golfito by the early 1980s, banana workers flocked to the countryside to settle, farm, and eke out a living in the forest. A study by William Holliday concludes that with the impact of these infrastructure and social developments, deforestation due to banana expansion accounted for up to 20 percent of Costa Rica’s total annual deforestation rate.<sup>9</sup>

Other agricultural changes starting in the 1950s (referred to as the “era of transformation”) hastened deforestation in Costa Rica.<sup>10</sup> Up until this point, the “dessert crops” (coffee, bananas, and to a lesser extent sugar, cacao, and tobacco) dominated agro-export production. The postwar world economy, however, affected Costa Rican production. European and North American demand for Costa Rica’s products fell after World War II because other tropical regions, such as Africa and Southeast Asia, began vigorously competing on the world market. In the late 1940s and early 1950s African palm trees were introduced in Costa Rica on former banana plantation land. The trees were planted to begin a palm oil industry (for the manufacture of margarine and other products) and as a way to diversify the agricultural economy. Like bananas, this exotic species thrived but required capital-intensive management.

Likewise, the sharp decline in world coffee prices in 1958 affected development patterns. Coffee, long Costa Rica’s sole means of economic leverage in the world import-export arena, nevertheless was always vulnerable to demand and at the mercy of foreign land speculators and financiers. The government responded with its program of *desarrollo hacia adentro* (internal development) to promote manufacturing and encourage other agricultural industries to develop in Costa Rica.<sup>11</sup>

One commodity that emerged in the 1960s and 1970s was cattle. Since the colonial years when Spanish settlers introduced domestic livestock to

the Central Valley, cattle have thrived on the lush valley grasses and have supplied beef for local markets. In 1855 Carl Hoffman described how the valley was “perfect for cattle.” The “superabundant meadows, eternally green, fresh, and maintained by the cool temperatures and daily showers,” he wrote, were the ideal “natural conditions [that] have given to industrious men [the means] to establish a great cattle business.”<sup>12</sup>

The cattle business, however, remained limited to providing beef for local and regional consumption until the 1970s. Then an exponentially growing North American market, strongly rooted in the need to supply fast-food restaurant chains with hamburger due to a sharp shortage of cheap cuts in the United States, encouraged Central American countries to expand ranching interests. Costa Rican farmers, ranchers, and speculators leapt at the opportunity, especially after discovering that the Asian zebu breed of cattle was so well adapted to the terrain and climate of Costa Rica. One of the oldest living species, the zebu (with the easily recognizable hump between its shoulders and large, floppy ears) has lived for millions of years in India and is considered to be the most widely distributed breed of cattle on earth today. In a 1969 article, the San José newspaper *La Prensa Libre* explained to its readers why they were seeing such dramatic increases in the number of zebu around the country. Calling it the “ideal bovine for the tropics,” the article related how zebu have great resistance to tropical diseases, are able to move their flexible skin to shake off pesky insects and to eliminate excess heat (unlike European breeds), and can easily graze on steep slopes. That zebu are not susceptible to hoof and mouth disease made U.S. import approval possible and gave meat dealers the green light to wholesale the beef to the hamburger chains.<sup>13</sup>

Zebu cattle seemed to be a perfect match for Costa Rica and by 1986 the country was the top beef producer in Central America—89 million tons, of which 36 million tons were exported. Ninety-six percent went to the United States, which received more beef from Costa Rica than from any other Central American country. In the late 1970s the U.S. Department of Agriculture policy on fixed quotas allowed for a staggering 9.8 percent of all imported beef to be from relatively tiny Costa Rica.<sup>14</sup> Cattle raisers there worked hard to meet the annual challenge.

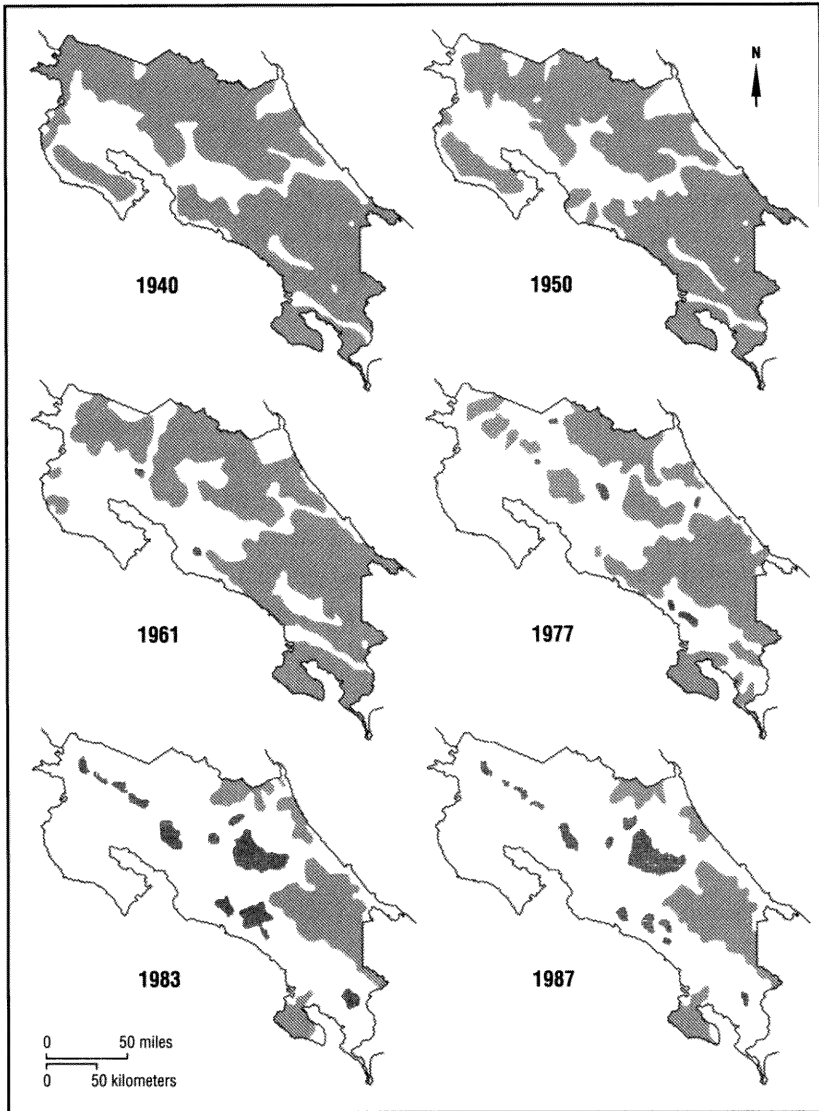
By the 1980s, however, this “volatile dependence” on the United States, as Susan Place explained it, became hostage to a “fluctuating market” and to the whims of the U.S. Congress, which established and

changed (lowered) these import quotas. The emphasis on exporting beef triggered a variety of social and environmental consequences. One was the significant drop in locally consumed beef. Simply stated, there was less meat available due to the push to raise cattle for export. Local prices for dairy products and beef subsequently climbed, which lowered the overall standard of living for the nation. To illustrate the dilemma, the scarcity of local beef was especially noted by the McDonald's hamburger chain in Costa Rica, which in 1977 had to import 140,000 pounds of meat a month from Guatemala.<sup>15</sup>

The powerful Cámara de Ganaderos (Cattlemen's Trade Association) lobby was extremely influential in gaining and maintaining governmental support for export production. The government provided such generous tax and credit incentives to ranchers that many dairy farmers switched to raising zebu for beef. The number of cattle raised in Costa Rica tripled in three decades: from 607,850 head in 1950 to 2,050,350 head in 1985.<sup>16</sup>

This kind of cattle industry requires massive amounts of pasture. Not exactly a prairie republic, Costa Rica had to create pastureland through systematic deforestation efforts. By 1980 over 6,500 square miles, or about one-third of the country, had been converted to pasture. More important, according to land use capability (LUC) studies, only 9 percent of Costa Rica is ecologically fit for pastureland. Julio Calvo, a forester at Costa Rica's Institute of Technology, argues that this land is "suffering from erosion and loss of productivity owing to inappropriate management." Geographer George Guess suggests that because of erosion, Costa Rican pastureland "works towards its own obsolescence with tragic efficiency." LUC studies have identified 54 percent of the damaged land as land that could have been used for annual crops.<sup>17</sup>

More alarming than these figures for pastureland is the rate of forest loss. Costa Rica in the 1980s was losing 4 percent of its forested land a year—a rate that was higher than elsewhere in the Western Hemisphere, despite the more publicized information on deforestation from the Brazilian Amazon. (El Salvador, Haiti, and Cuba have even less percentage of remaining forest cover, but because not much forest is left, the rate of deforestation has slowed in those countries.) Former Costa Rican president and Nobel Peace Prize winner Oscar Arias admitted that "we deplore the sad leadership we possess in destroying our forests. No country in Latin America has a higher rate of deforestation than ours; less than five



**Figure 4.** Costa Rican Deforestation over Time (shaded areas represent forest cover) (source: Fundación Neotrópica)

percent of the nation's dense forests exist outside protected areas." As late as 1950, 90 percent of the country remained in forest cover, but by 1990 the figure had dropped to only 25 percent (see Figure 4). In turn, 17 percent of Costa Rica's land was degraded, with an estimated 680 million tons of topsoil a year being washed away.<sup>18</sup>

While much of this loss was due to expansion of agriculture and pasturelands, which increased by 250 percent from 1950 to 1984, the timber industry is also responsible for massive deforestation. In fact, it was the timber industry that first opened up many forests for agricultural development by constructing roads into previously inaccessible areas and clearing land for fields. By the late 1980s there were 17,000 miles of roads in Costa Rica, more than in any other Central American nation.<sup>19</sup> What B. E. Lemus calls the “forest industrial complex” is big-business timbering, most of which occurs on private land. However, because of imprecise surveying efforts, poorly delineated boundaries, and underbudgeted enforcement measures, logging (and the resultant pasturing) has occurred inside protected areas as well. And instead of using a plan of selective cuttings in forest reserves, timber companies have been clearcutting large tracts of densely forested areas for short-term economic rewards. Two-thirds of all harvested timber is consumed as fuel and much is wasted, as Carolyn Hall points out, due to “deficiency of extractive methods and the lack of industries to use the poorer quality wood.” Such waste and unsustainable harvests are fast resulting in a situation that some fear could make Costa Rica have to import wood for domestic use by the year 2000.<sup>20</sup>

Along the roads made to haul timber out of the backcountry came squatters—poor settlers called *precaristas* (literally, those in a precarious situation, living on the edge)—looking for land to farm and a way to feed their families in newly deforested areas. Colonizing farmlands in the tropical forests by such people was nothing new in Costa Rica. In the 1930s Alexander Skutch observed squatters moving into the El General Valley who were “eager to take possession of as much land as [they] could for this sort of agriculture.” The squatters, he wrote, were “obliged by law to clear and plant at least half [their] area” and during each dry season “renewed [their] attack upon the dwindling forest.” He reminisced that “January and February were the chief months when the woods were levelled. . . . Before they felled the tall trees, the laborers cleared away all the underbrush with their machetes. This made the forest parklike and most inviting. . . . Soon the big trees were attacked and overthrown, the noble forest reduced to a scene of chaos and ruin.”<sup>21</sup>

The *precaristas* of the 1960s, 1970s, and 1980s practiced similar agricultural techniques, although most used fire instead of an ax to clear the forest. The colonizers came out of the interior of the country and mi-



grated toward the coasts. In 1961 the Law of Lands and Colonization (similar to the Homestead Act in the United States and discussed in more detail in Chapter 3) was enacted. It established the Institute on Lands and Colonization (ITCO) to aid the *precaristas* and imposed sanctions on landowners retaining uncultivated acres. ITCO encouraged migration in the early 1960s to "improve" virgin "farm" land. But while the majority of *precaristas* squatted on land designated as farm areas, they did not settle solely on private land. The conservation organization Fundación Neotrópica reported that a staggering 25 percent of federally protected land was invaded at one time or another. Cropland and cattle pastures were established before the government could react and, in many cases, before it even knew. Likewise, some *precaristas*—without permission from the landowners—occupied and attempted to farm plantation land belonging to foreign owners.<sup>22</sup>

By the 1980s, colonization was becoming a significant economic, sociological, and environmental problem. Some estimates suggested that one-sixth of all Costa Rican families were *precaristas*.<sup>23</sup> Making a long-term, better living for their families, however, in many cases did not materialize. Cleared land and supplies were bought on credit. Interest rates and principal became difficult to pay when prices and demand for agricultural commodities dwindled. Price policies set far from where the *campesinos* worked dictated production needs without the squatters' knowledge or ability to change crops. An even greater setback was erosion. Crops could be grown for only three to five years, after which many peasant families were forced to sell out to large real estate firms which, in turn, sold the land to ranchers for use as pasture. Intensive grazing made the land suitable for only four to six years more before rendering it completely degraded. Meanwhile, the *precaristas* searched for and moved to new frontiers, renewing the destructive cycle.

To be fair to the squatters, it is important to note that not all research shows *precarismo* to have had a negative impact. Beatriz Villareal maintains that in 1973 (near the height of the *precarista* period) the squatters represented only 8 percent of the rural population. Daniel Janzen has argued that "squatters have never been a problem on government or private land under conspicuous use" and that at Guanacaste National Park (a preserve that Janzen was instrumental in establishing) squatters would only take marginal land. Likewise the OTS in 1984 began an environmental education program for squatters living near its La Selva biological

station that was aimed at “treating them as friends and neighbors and not as invaders.” A similar approach was used at Monteverde. There the World Wildlife Fund and the Canadian-based Monteverde Conservation League sold tracts of land to *precaristas* for twenty-five dollars an acre to help them relocate away from endangered tropical rainforests.<sup>24</sup>

Overall, the impact of deforestation in Costa Rica is indeed multifaceted. There is not only the obvious loss of trees and therefore timber, but also the loss of wildlife habitat (especially of threatened and endangered species), scenic value, and watersheds. Deforestation also results in river silting (caused by erosion on cleared lands), disruption of fisheries and traditional fishing grounds, abnormal flood-drought cycles, riverbank erosion, heavy soil compaction (from cattle), and soil sterility that often leads to complete desertification of the area. An important 1972 study on the subject explained the desertification process by showing how forest areas that were cleared and not allowed to recover “never reached the climax stage [of succession].” The clearing caused a “reduction in organic matter and nitrogen removal of the original vegetation exposing the soil to full sunlight and to receive the full impact of rainfall.” In turn, surface temperatures rose and humidity fell. If the area was burned, the deterioration process was magnified.<sup>25</sup>

### The Agricultural Dilemma

Costa Rica’s past experiences with land use have led to a late-twentieth-century agricultural dilemma. The problem teeters between agro-development (for short-term economic prosperity) and environmental conservation (for long-term protection of natural resources). The noted Latin American economist Raúl Prebisch refers to this dilemma as a “technical ambivalence” in which increased productivity has made an “enormous contribution to human welfare . . . but at the same time has had serious consequences for the biosphere.”<sup>26</sup>

In addition to the negative environmental effects, deforestation in Costa Rica has caused serious economic problems. The decrease in watersheds meant a reduction in hydroelectric generating capability, thereby limiting the flow of electricity and reducing employment opportunities in some sectors of the economy. Soil sterility and overgrazed pastures have led to an overall loss of potential economic opportunities from sustainable agriculture. The problem was grounded in a widespread belief in

abundance theory—a lack of acknowledgment of a renewable resource problem. The theory was defined by one study as that pattern of thinking in the 1960s and 1970s based on the belief “that Costa Rica had more than enough resources and that no shortages would develop.” In contrast to nineteenth-century agricultural patterns, many Ticos (what Costa Ricans fondly call themselves) in the last forty years have believed that “basically the entire country was suitable for agriculture and livestock and that forests were only impediments to development.” Deforestation, then, was seen as an “improvement” to the land. But what Ticos thought might be a “giant step towards modernization,” wrote geographer John Augelli, in reality became a “minimum of socially desirable and environmentally adaptive components [resulting in] painful social and ecological costs.”<sup>27</sup>

A landmark study of the banana problem in the Sarapiquí region of northeastern Costa Rica defines the environmental transformation as a six-step process: economic opportunity due to market expansion (in this case, Europe); the purchase or governmental concession of land (including rainforest that is “promptly cut down”); the importation of workers (historically from the British West Indies, but more recently from Nicaragua); the release of a large percentage of the workforce when their service is no longer required; the workers’ usually unsuccessful search for other employment (and thus their search for land on which to grow subsistence crops); and the resultant forest invasions, which cause more deforestation. “In this way,” the authors conclude, “Costa Rica, one of the world’s showcases of conservation, is currently promoting a policy that actually encourages rainforest destruction.”<sup>28</sup>

The three major banana-producing multinational corporations (United Brands [Chiquita], Standard Fruit [Dole], and Bandeco [Del Monte]) plus several other producers have all been dependent on chemical pesticides for increased harvest yields. These yields, however, have been accompanied by environmental and public health disadvantages. In a study entitled “Effects of Banana Expansion on Human Health and the Ecological System,” University of Costa Rica scientists Leonardo Mata and Alfonso Mata summed up the situation by writing that “an environmental and sanitary disaster generated by the banana plantations” was the result of the industry’s “predominant interest in the economics, over the ecology,” of the crop.<sup>29</sup> Standard Fruit, for example, was using the fungicide DBCP (dibromochloropropane) in the early 1970s until it

caused sterility in 2,000 workers. Similarly, according to the Mata and Mata study, 76 percent of all pesticide poisoning claims at the National Insurance Institute were filed by banana plantation employees. And in a different report, S. A. Lewis disclosed that by 1992 Costa Rica's pesticide use was seven times the world's per capita average, resulting in 250 to 300 cases annually of pesticide poisoning involving agricultural workers. He called the expansion of banana plantations "a model of modern, unsustainable agriculture."<sup>30</sup>

Banana production has also been the source of other forms of pollution in Costa Rica. A well-publicized case in point was in the early 1980s when scientists discovered that Cahuita National Park (the country's first protected coral reef on the southern end of its Caribbean coastline) was suffering from sediment runoff from nearby banana plantations in the Estrella River Valley. A graduate student in biology named Jorge Cortés investigated the situation and ended up writing his master's thesis on the sediment runoff that was endangering the coral environment. Heavy concentrations of iron, lead, copper, and other metals were flowing down the streams from the banana plantations into the Caribbean and were building up on the fragile reef. Cortés, now a marine biologist specializing in coral reefs at the University of Costa Rica, claims his work on the Cahuita crisis was aimed at "creating an awareness" for the danger involved to the marine ecosystem. But while the Estrella River Valley plantations were penalized and instructed to stem their chemical runoffs, Cortés claims that, having conducted a follow-up study at Cahuita in the mid-1990s, the situation is "even worse" now with sediment buildup in the soil and mud.<sup>31</sup>

Many other cases of fertilizer and pesticide runoff from banana plantations—one form of nonpoint pollution—have been evidenced in Costa Rica. In 1992, for example, toxic nematicides from plantations near Tortuguero in Limón province were linked to a massive fish kill. A lagoon near Tortuguero was, as one newspaper proclaimed, "white with dead fish" floating in it. Even so, the minister of natural resources at the time, Hernán Bravo, claimed it was difficult to trace the exact origin since it was nonpoint contamination.<sup>32</sup>

Likewise, waste generated by the banana industry has been cause for concern. The Mata and Mata study found that 3.5 million tons of waste were produced annually by the plantations. An IUCN report claimed that 2.14 tons of waste, three-fourths of which is nonbiodegradable, are pro-

duced for every ton of bananas. Part of the mess has been due to the blue plastic bags used to protect bananas from the damaging rays of the sun. The bags were typically removed in the field, tossed into streams or canals, and carried off to the sea, adding to ocean pollution and endangering giant turtles and other marine life.<sup>33</sup> In 1992, under heavy pressure from local and international environmental groups that were threatening worldwide banana boycotts, a consortium of banana growers agreed to construct a recycling plant for the plastic bags (to be Costa Rica's largest recycling center), formed a Banana Ecology Commission, and started a "zero plastic" program. According to reporter Michelle Sheaff, it appeared as if the banana companies were "turning green." Corporación Bananera Nacional, for example, appointed prominent environmental activist Alexander Bonilla to its board of directors to oversee a reforestation plan in phased-out banana plantations. More important, the Rainforest Alliance and Fundación Ambio of Costa Rica joined together to develop the "ECO-O.K. Banana Project," which helps fruit growers meet a code of environmental conduct. The standards deal with how growers should avoid clearing rainforest for plantations, establish greenways of native vegetation along roads and rivers, control the use and storage of pesticides, and manage organic and plastic wastes. It's a voluntary program, but those who meet the standards are rewarded with an "ECO-O.K." seal of approval and can apply stickers directly to the certified bananas to promote their more ecologically friendly produce. One study found that Chiquita, the industry leader, has been "especially vigorous" in investing in "broad, costly changes . . . to benefit the environment." It concluded that the program is "an example of what biologists and conservationists can accomplish by venturing into what was once considered enemy territory—in this case banana company boardrooms." And Jorge Cortés noted that the problem with blue bag pollution has definitely improved.<sup>34</sup>

The dilemma with Costa Rica's banana industry is both environmental and social. Some plantation owners say they are working to reforest their lands. Cortés claims none have done so. The owners claim to bring in thousands of jobs to the country, but bringing more people in can be part of the problem. Luis Fournier notes that importing seasonal workers is a huge "demographic problem" and is Costa Rica's foremost environmental challenge for the twenty-first century. He cites as evidence the large influx of Nicaraguan laborers seeking work on banana plantations

and the pressures on the environment and public services that have resulted.<sup>35</sup>

Not all conservationists agree. Alexander Bonilla claims that workers have to have employment and a place to live before they can ever begin to think about conserving resources, although he adds that they should be encouraged to learn sustainable agricultural methods. Likewise, environmental attorney Roxana Salazar believes that the banana workers do not represent “an ecological problem” and notes that recent immigration legislation is working to address the problem.<sup>36</sup> The immigrant workforce is in part due to the fact that most Costa Ricans refuse to do that kind of hard work for such low pay.

But perhaps the problem has a wider base. Hardly limiting the blame to the government of Costa Rica or the large corporate plantations, John Vandermeer and Ivette Perfecto assert that the “same biologists, ecologists, and eco-tourists who love the rain forest when they’re in Costa Rica also love to slice bananas on their cereal in the morning.” They suggest that with the “penchant for viewing the world in isolated little disconnected fragments, it is apparently difficult for us all to see the connection between the knife that slices the banana in our cereal and the chainsaw that slices tree trunks onto the rain forest floor.”<sup>37</sup>

And while cattle production at one point seemed to offer economic salvation, it instead added to Costa Rica’s agricultural dilemma. It lowered the per-acre output of production, eliminated other crops, and increased the amount of food to be imported for local consumption. An estimated 96,000 to 192,000 acres are taken out of crop use annually for the cattle industry. Most of the conversion has been for short-term value and has had heavy environmental consequences—part of Costa Rica’s struggle to confront an economic reality. When farmlands became ranchlands, displaced peasants were not absorbed into the cattle workforce. Coffee production requires 130 working days per hectare per year (rice sixty and beans thirty-seven), but cattle require only six. Advances in agricultural technology also translated into less need for field hands. With so little work to be found in the country (and what work there was paid poorly), thousands of *precaristas* had no other choice than to return to San José or other cities—the completion of the colonization cycle. Twenty-five percent of the rural population of 150,000 became classified as “landless workers/farmers”—the highest percentage in Central America. Hence, a development contradiction emerged in the late

1970s when 90.3 percent of all land in production (reduced to 82 percent by 1985) for the cattle industry was accounting for only 12 percent of total agricultural exports and a small percentage of the GNP.<sup>38</sup>

Those kinds of statistics prompted geographers and economists to conclude that the beef boom was actually “underdeveloping” the Costa Rican economy, increasing tensions among the people, and creating social and economic problems. They pointed out how the cattle industry had displaced a sustainable harvest of timber—resulting in a \$4.68 million net loss in the economy from potentially marketable hardwood trees. The cattle industry had become a “drag on the economy” instead of its greatest motor and had concentrated the wealth into “landed elite” by squeezing out many small farmers.<sup>39</sup>

Agriculture, in general, cannot be ignored in Costa Rica. It is the nation's leading industry, and agricultural lands cover one-half of the country. Two-thirds of the national economy revolves around agriculture, with bananas as the top crop (occupying nearly 100,000 acres of lowlands and still controlled by foreign corporations), followed by coffee, sugar, and beef. Cacao is still an export crop but is raised primarily on small farms. Food crops like rice, corn, beans (the principal source of protein for most Costa Ricans), fruits (especially pineapples), vegetables, and palm oils are other secondary, but important, products. There are many small subsistence farms, but about three-fifths of all Costa Rican farms are either of medium size or *minifundias*—farms that grow subsistence crops and some export products. Large estates make up only 3 percent of Costa Rican agriculture. Cattle ranchers tend to take too much land out of more useful, sustainable production and, as one study notes, employ “few and enrich even fewer.” Costa Rica has had limited success with land reform, but it has often not been compatible with the government's emphasis on agricultural development.<sup>40</sup>

Hopes to stimulate the economy in the 1970s and 1980s by producing more internationally marketable products—an economic theory known as “comparative advantage”—prompted more land to be cultivated. Thousands of acres were turned into citrus groves and ornamental plant fields. Visions of high yields necessitated the introduction of great quantities of chemical fertilizers and pesticides that the crops required. To cope with the debt crisis of the early 1980s, Costa Rica further accelerated these measures. The International Monetary Fund (IMF) insisted that Costa Rica produce more nontraditional crops like pineapples, flow-

ers, and ornamental plants. These could be sold in an ever-growing world market to generate capital flow to help satisfy creditors. By the late 1980s the nontraditional crops accounted for 30 percent of all Costa Rican agro-exports.<sup>41</sup>

While international lending organizations considered this a success, Costa Rica was experiencing difficulties with comparative advantage. Major multinational corporations (e.g., Del Monte, United Brands, and Philip Morris) were controlling the growth of export products while not enough beans, rice, and corn were being planted to feed the nation. “*Frijoles sí, flores no*” (“Beans yes, flowers no”) became the rallying cry for a 1987 *campesino* protest of these policies, led by farmer-activist Carlos Campos. Warning against an agrochemical “dependency,” Campos wrote that “the reality is that we Costa Ricans are now dying, that we are destroying our soil, and from now on we should begin to demonstrate that, as farmers, it is necessary to present alternatives.”<sup>42</sup>

From 1950 to the 1980s, then, Costa Rica sustained vast environmental damage from its agricultural development. It has been suggested that “Costa Rica was rapidly becoming a runaway train on a steep and curvy downhill grade” before policies started to change to preserve what environment was left.<sup>43</sup> Deforestation became a significant rallying call in the conservationist community, urging the government of Costa Rica to legislate against forest abuse. In the late 1960s the Ministry of Agriculture appointed a committee to study the problem and draft a bill that would enable the government to limit deforestation. The result was the Ley Forestal (Forestry Law) of 1969, which, in many ways, became the turning point in Costa Rican conservation history. The law (discussed further in Chapters 3 and 8) established a system to designate and administer protected areas, such as national parks and monuments, that would be off-limits to forestry and agriculture. It also established the General Forestry Directorate to regulate the timber industry and discourage unwise forestry practices.

The Forestry Law of 1969, however, hardly slowed deforestation outside protected areas. In the decade following the law’s passage, Costa Rica experienced a 29 percent total forest loss.<sup>44</sup> Several authorities have tried to pinpoint how this could have happened. Luis Fournier blamed the lack of long-range planning, despite increased awareness of conservation needs. Carolyn Hall explained how the law was not actively enforced and how the permitting process was ineffective. Permits were to have been

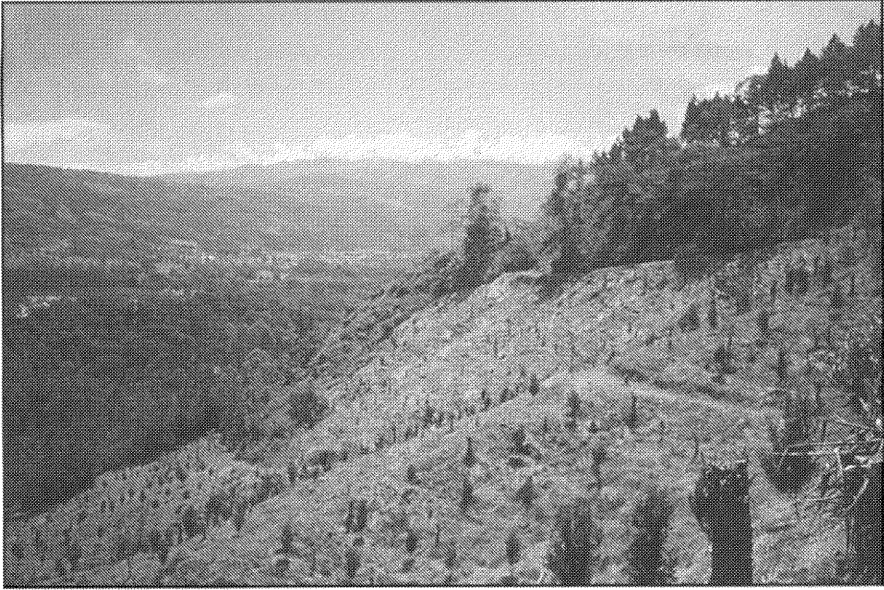


obtained by forest users from the DGF before any timber could be cut from private or public lands, but the new forestry agency lacked “the funds and trained personnel to enforce the law.” While the DGF was supposed to have complete control over all timber cuts, it has been reported that by 1989 roughly one-half of all trees felled lacked the proper permits.<sup>45</sup>

Likewise, many thousands of trees were harvested in banned areas. Deforestation occurred in parks and on the perimeters of protected areas, which affected their overall environmental integrity. Because funds were scarce, as Bill Weinberg reported, insufficient vigilance near protected zones opened the way for “ranching, slash-and-burn *campesino* farming, high-pesticide corporate agriculture (such as banana plantations), or timber exploitation” on the borders of the parks and often extended into them. In 1971, only two years after the Forestry Law was enacted, forestry biologist Joseph Tosi of the Tropical Science Center issued what became a famous warning—that by 1985 there would be virtually no natural forests left in Costa Rica if the deforestation rates of the time continued. Luckily Tosi’s predictions for forest loss did not completely materialize, but by 1987 Costa Rica was still losing 120,000 acres of forest a year.<sup>46</sup>

The bleakness of the above scenario has certainly tested Costa Rica’s image as a “green republic.” Fortunately, the scenario is being offset by changes occurring in Costa Rica. Squatter colonization persists but has declined dramatically since the mid-1970s. In 1977 the Reforestation Law was passed, which was the government’s first attempt to restore degraded forest lands. The government repealed the tax on uncultivated farmland and established tax incentives, loan assistance, and technological help for reforestation efforts. It has been an expensive project that has not yet been totally successful on a nationwide basis, but it has great economic potential for providing a sustainable wood-products industry. One project near Turrialba called Programa de Diversificación has been successful in repopulating trees and employs the services of local small-scale foresters.<sup>47</sup>

Reforestation has many logical advantages. Lands that were formerly banana plantations, however, are especially slow to reforest or to produce much of anything else. Likewise, there are many thousands of reforested acres that have become plantations of single-tree species and therefore, as Hall relates, “insignificant in relation to the magnitude of the ecological problem they are intended to solve.”<sup>48</sup> The most common plantation



**Figure 5.** Hillside Deforestation near Turrialba

tree crop in Costa Rica is teakwood. Teak trees (*Tectona grandis*) are tall Asian timber trees that are an introduced species in Central America and thrive in Costa Rica's lowland tropical areas, especially on the Pacific Coast. Teakwood is a hard yellowish wood that in the past was often used in shipbuilding. It now enjoys a healthy world market for other wood products, especially in the increasingly wood-starved Far East. The problem is that thousands of acres of deforested land are being proclaimed "reforested" by the teak industry. Advertisements across the country hail such benefits as erosion control, soil conservation, and wildlife cover that teak plantations supposedly offer.

The plantations, however, are a far cry from the original forest cover. Teak trees are planted in symmetrical rows, grow at even heights, have weeded and well-groomed rows between them, and are felled at the same time when mature. The reforested plantations "help the soil for a while," forestry botanist Luis Fournier recently explained, "but eventually the soil deteriorates with more cuttings." The industry advertisements, he asserted, do not give the complete picture and are used to get more people (often foreigners) to invest.<sup>49</sup>

As powerful a problem as deforestation is in Costa Rica, in many ways it did help wake up a nation to its environmental responsibilities. The

## **52 Costa Rica's History of Conservation**

voices of many started to become louder for the more rational conservation of natural resources. Lobbying became intensive for the designation of more and more national parks and protected areas. Part of that solution meant that the government would have to take a more active position in legislating protection and funding enforcement. Recent steps have been taken to crack down on wilderness exploitation. The Rural Guard conducts spot checks for illegally cut logs (often hidden in produce trucks). At the urging of the DGF (and despite a great uproar from the timber industry), the government declared a state of emergency concerning the deforestation crisis in the late 1980s. Agencies can now suspend permits to cut trees outside of private plantations and can prohibit the export of unfinished wood products. Likewise, funds have been earmarked specifically for the enforcement of these measures.

None of these successes occurred spontaneously. Environmental reforms, reforestation, national park development, and ecological education did not evolve in Costa Rica without the will and determination of many Costa Ricans. The result can be seen in the history of Costa Rican conservation, as will be discussed in subsequent chapters.

## **The Conservationist Response**

The national parks belong to all Costa Ricans equally, and therefore they have the right to enjoy them . . . but also the duty to protect them.

Mario Boza, *Guía de los parques nacionales de Costa Rica*

### **Early “Parks” and Conservation Laws**

As in most countries, conservation policies in Costa Rica were a mid- to late-twentieth-century phenomenon. While there were no actual national parks in Costa Rica until 1970, some earlier measures had attempted to deal with preserving parts of the nation’s natural heritage. One concept of protecting areas goes back to 1863. It was then that the government set aside a tract of forest on both sides of the Camino del Norte to be excluded from cuts. In 1906 the Legislative Assembly passed Law No. 36, which obligated the executive branch of government to recommend a general forest policy to the Assembly. While this law prompted some initiatives and orders, it was vague and no national policy was created.

An influential person in early conservation policy making was Enrique Jiménez Núñez. Jiménez earned his graduate degree in engineering in Belgium but returned to Costa Rica where, according to Luis Fournier, he “started to form an awareness for environmental problems.”<sup>1</sup> Appointed to the office of state secretary of development and agriculture, Jiménez

promoted a plan to diminish the burning of forests, which resulted in the Ley de Quemados (the Fire Law) of 1909. The law established guidelines for the use of fire to clear forested land. Jiménez understood the connection between forest cover and water supply and wrote that burning mountainsides “destroys many of the principal sources of the public wealth, it disfavorably modifies the normal rates of rainfall . . . [and] has transformed the most prosperous and rich countries into deserts.”<sup>2</sup> Unfortunately, the Fire Law lacked any strong enforcement measures and did little to prevent deforestation in the decades to come. Jiménez also advocated a project that would have nationalized all of Costa Rica’s water systems in 1910 (which did not culminate into law) and devised a plan to eliminate the dumping of coffee plantation by-product waste into rivers in 1914.

Other conservation policies were enacted in the early decades of the twentieth century. In 1913, for example, the government classified Poás Volcano as “protected” but provided no authority or enforcement to monitor the mountain. In the same year, the government declared a 600-foot swath of forest inland from Costa Rica’s coasts, and an 800-foot swath along river banks, to become the first “national forests.” Again, there was a lack of clarifying language and authority to enforce any protective measures. Two laws were passed in 1923 aimed at preserving water. The first, Law No. 52, prohibited the dumping of waste products from sewers, dairies, and slaughterhouses into the nation’s rivers; the second, Law No. 68, was for the protection of watershed systems.

The 1930s witnessed additional, albeit nominal, initiatives to protect the nation’s forests. In 1930 a regulation was decreed to establish a system of forest guards (*guardabosques*) to ensure the conservation and rational use of the forests. The enforcement of the act was placed in the office of the “forestry chief” of the national agricultural department in 1933.<sup>3</sup> Law No. 13 of January 1939 went a bit further to establish “preserves” around Poás and Irazú volcanoes and in the forests on both sides of the Cordillera Central. The law, however, was really more like a philosophical resolution because it included no exact delineations or enforcement clauses. Called the General Law on Vacant Lands, this measure declared that all vacant lands “that have no legitimate title for private owners, have not been registered with the Public Register, [and] are not occupied by a public service” would belong to the state. The law also established the government’s right to eminent domain.<sup>4</sup>

There was limited interest in conservation measures in the 1940s as well. Recognizing the international aspect of preserving nature, Costa Rican delegates signed the Convention on Nature Protection and Wildlife Preservation in the Western Hemisphere in Washington, D.C., in 1940 (although it was not ratified in the Legislative Assembly until 1966). In 1943, when Costa Rica's segment of the Pan American Highway was constructed, biologists Charles Lankester and Mariano Montealegre proposed the idea of protecting as a "national park" a region on both sides of the road that they discovered was home to what they believed were the world's largest oak trees. Law No. 197 of 1945 designated 6,000 feet on both sides of the highway as a "national park" (the first time such a term was used in Costa Rican legislation) and stipulated that no forest exploitation would occur in the area. Unfortunately, the law was never really put into effect, placed no one in charge of its administration, and therefore left the oak forests open for timber cutting. The law was abrogated in 1973, as former park service attorney Ana María Tato explained, "because there was nothing left to protect."<sup>5</sup>

In 1948 a political upheaval ended in the revolution of National Liberation that thrust José Figueres Ferrer into the presidency of the Junta Fundadora of the "Second Republic" (1948–1949). The revolution, however, did not disrupt plans for a Costa Rican delegation to attend and participate in the Inter-American Conference for the Conservation of Renewable Natural Resources that was held in September of 1948 in Denver, Colorado. The conference, promulgated at the Third Inter-American Agricultural Conference in Caracas three years earlier, was a forum designed to share ideas from the countries in the Western Hemisphere and to promote regional cooperation on conservation concerns. One of the Costa Rican participants presented a paper on the growing interest in forest protection in his country and how the state should be actively involved in overseeing conservation to guarantee "a land with resources for the future."<sup>6</sup>

José Figueres and the government of the Second Republic placed emphasis on education and social services, abolished the military (an act that Costa Ricans often cite as vital for freeing government funds for such things as higher education and, later, conservation), and established the Instituto Costarricense de Electricidad (ICE)—the country's public utility corporation that supplies electricity. Understanding the importance of forest cover for ensuring the hydrologic needs of the ICE, the Figueres

administration issued a decree in 1949 to establish a Forest Council to inventory forest resources and to protect forested watersheds from diseases and fires. Although noble in theory, Luis Fournier later lamented that "in practice, this entity was never put into action."<sup>7</sup> It was eliminated four years later. Also in 1949, however, the Ministry of Agriculture and Livestock (MAG) added a Forestry Section division to its responsibilities. This proved to be a decisive move because the nation's forests remained under MAG jurisdiction until the mid-1990s.

The administration of president Otilio Ulate (1949–1953) supported other conservation-minded ideas. In 1950 the government established the National Week for the Conservation of Natural Resources. The event was organized by an interdisciplinary amalgam of government agencies (including the ministries of public health, agriculture, industries, and education) and was designed to remind the citizens of Costa Rica of their duty to conserve soil and water for the long-range benefit of the country. The commemorative week, always held in June, has been observed with celebrations, symposia, and special events every year since its inception.

In 1953 the National School of Agriculture initiated legislation that resulted in the passage of the Soil and Water Conservation Law, signed by President Ulate. Spearheaded by agricultural engineer Alvaro Rojas Espinoza, the law required that soil studies be conducted on agricultural areas to determine the rational use of the land. But it also contained language that authorized MAG to earmark areas to be protected as "reserves, parks or national forests . . . for common use." Despite the fact that MAG never took advantage of this opportunity, the law helped fuel a growing conservation awareness in the nation and, as Luis Fournier notes, was "perhaps the most important [legislative] event of the time period."<sup>8</sup>

Other efforts that assisted conservation marked the second (noncontiguous) term of President José Figueres (1953–1958). In late 1953, for example, Figueres named a study commission to develop legislation for the creation of a national tourism council. Commission members visited Peru, Mexico, Argentina, and the United States to seek ways to develop a park system in Costa Rica. Their work culminated in the passage of Law No. 1917, which created the Instituto Costarricense de Turismo (ICT) in 1955. Part of ICT's mission was to designate a 1.2-mile radius around each volcano crater in the nation as a "national park." But "without technical criteria for national park objectives at this time," reminisced a for-

mer park service official, "economic and ecological reasons impeded the execution of that dimension of the law."<sup>9</sup> In 1958 an ICT study addressed where other national parks should be established, further emphasizing volcanoes and oak forests, but economic considerations once again thwarted implementation of the plan.

Costa Rica's first wildlife legislation was also a product of the mid-1950s. The Wildlife Conservation Law of 1956 (revised in 1961) defined wildlife as "those animals that are not domesticated or domesticated animals that have turned wild" and went on to state that all such creatures were "the property of the State." It declared that the wildlife were part of the "renewable natural resources of the country" and that the "conservation, restoration, and propagation of all wildlife useful to man" was of "fundamental interest" to the public. The law also spelled out hunting and fishing regulations but stated that they did "not apply to farmers who [could] kill wild animals on their property because they were threatening to destroy their crops."<sup>10</sup>

To oversee such policies, the law established a wildlife office within MAG. It also created a five-member National Wildlife Protector Committee that would make recommendations to MAG, study MAG's abilities to regulate wildlife, and serve as a general advisory board. The committee, however, seemed lopsided and padded; three members represented hunting and fishing organizations, one was a government fiscal agent, and only one was a biologist from the University of Costa Rica.<sup>11</sup>

As could be expected, the law prompted intensive lobbying and spirited debate on both sides of the issue. Hunting and sporting organizations argued for its support, and humane society members lobbied against the law when it was being considered by the Legislative Assembly in 1961. Opponents argued that the Protector Committee was too much like the fox guarding the henhouse.<sup>12</sup> Nonetheless, the bill became law and changed very little even with revisions in 1970.

Other attention was given to wildlife issues in the 1970s when the Costa Rican legislature endorsed international treaties regarding threatened or endangered species. In 1974 it ratified the Convention on International Trade in Endangered Species (CITES), which established a system of trade sanctions and a worldwide reporting network to reduce the traffic in threatened wildlife. And two years later on a more regional level the Legislative Assembly ratified the Convention for the Protection of



Flora, Fauna, and Places of Natural Scenic Beauty in the Countries of the Americas. That convention specifically outlined how national parks and reserves should be established and guarded for wildlife protection.<sup>13</sup>

To evaluate the country's policies for the protection of native flora and fauna and eventually to recommend changes in the Wildlife Conservation Law, the government sponsored a week-long wildlife symposium in 1980. Called the First National Congress on Wildlife Conservation, the event was organized by the Biological Studies Department of MAG and the National Wildlife Protector Committee. Presiding over the congress were Hernán Fonseca (MAG), Gerardo Budowski (CATIE), and Augustín Rodríguez (ICE). Participating organizations included the hunting and sporting clubs, CITES authorities from Costa Rica's U.N. office, the Association of Costa Rican Biologists, CATIE, several colleges and universities, the tourism council (ICT), and two environmental groups. President Rodrigo Carazo gave one of the opening addresses, and speakers and presenters represented a virtual "who's who" in national conservation activism. Participants included Alexander Skutch, Gary Stiles, Archie Carr, Joseph Tosi, Mario Boza, and Alfonso Mata. Many of the presenters were leading proponents in the development of Costa Rica's national park system, including Alexander Bonilla, Roger Morales, José María Rodríguez, Sergio Salas, Carlos Valerio, Murray Silberman, Christopher Vaughan, and many other biologists and conservation leaders.<sup>14</sup>

One of the outcomes of the symposium was the revised Wildlife Conservation Law of 1983 (further revised in 1990 and in 1992). The new policy eliminated much of the "public utility" language of wildlife as a natural resource and concentrated more on protecting threatened species. Gone was the language allowing farmers to hunt at will, and in its place were stronger hunting regulations. The National Wildlife Protector Committee was also modified to include only two representatives from sportsman organizations. And, most important, provisions were built into the law to establish certain national wildlife refuges.<sup>15</sup>

Many conservationists in Costa Rica had come to understand all too well that protecting the nation's wildlife meant protecting habitat and ecosystems. In the late 1950s, for example, forest ecologists Luis Fournier and Gerardo Budowski had begun reforestation research projects in the central Pacific and Atlantic regions of the country. Their aim was to recuperate the tropical forest ecosystems by ways of natural regeneration.

But at the same time, the forests were being increasingly threatened

with the influx of squatter farmers and their families seeking new lands to clear and farm. Changes in land ownership and rises in population meant that thousands of rural Costa Ricans sought out *tierras baldías* (vacant lands) that were owned by the state. Aware that the problem was getting out of hand as far back as 1942, the Legislative Assembly passed the Squatter Law (Ley de Parásitos or Ley de Poseedores en Precario), which sought to halt squatter settlements on government land.

But the solution became part of the problem and actually exacerbated the exploitation of public lands. James Rowles, an authority on Costa Rican agrarian reform, notes that corruption and abuses of the Squatter Law resulted when large landholders “exchanged lands occupied by squatters (whom they often incited to invade) for virgin state lands.” The corruption illustrates how squatters were really more of a symptom of the larger problem of inequitable land distribution—a concern that did not go unnoticed by José Figueres and the revolutionary movement of the Second Republic. In fact, as Rowles points out, Squatter Law abuses “had a great deal to do with the desire [of the Figueres junta] to reform existing agrarian legislation,” and they became part of “the political ideology that guided the dominant Partido Nacional de Liberación (PLN) since the Revolution.”<sup>16</sup> A key member of the early PLN was the junta’s minister of agriculture, Bruce Masís, a strong proponent of agrarian reform and conservation. Masís led the efforts to eliminate the Squatter Law and to replace it with a land reform bill. The junta thus named a commission to study the problem and to draft a new agrarian code.

But reform legislation was slow in the making. José Figueres never made it a priority during the junta years (1948–1949) and the special commission never even met. Reform plans moved slowly through the legislative process during the Otilio Ulate administration (1949–1953), with a special commission again appointed to study the issue. Called the Committee on Agriculture and Colonies, it finally drafted reform legislation in 1953—only to be interrupted by the national election that gave José Figueres a landslide victory and a second term (1953–1958). Figueres had promised that the government would create a special institute to deal with lands and colonizations and named yet another committee to draft such a law.

By 1955, and only because of Bruce Masís’ perseverance, the commission’s proposal to establish a government institute for lands and colonizations finally made it to a committee of the Legislative Assembly. Polit-

ical maneuvering by the opposition party, however, prevented its passage in the mid-1950s and delayed the law until 1961. But finally, after years of executive commissions and legislative committees, the Law of Lands and Colonizations was approved by the Assembly and signed by President Mario Echandi. It has been amended and revised eight times since, but its purpose has remained the same: to administer agricultural colonization through its administrative agency, the Institute of Lands and Colonizations (ITCO).

Whether ITCO's goal has been successfully achieved remains to be seen. In its first ten years of implementation (1962–1972), 3.7 percent of rural families ( $n = 7,174$ ) received ITCO benefits—mainly in the form of attaining the legal rights to land they had already been occupying. Only 1,525 families benefited from the redistribution of 98,400 acres of land. Likewise, ITCO was able to resolve only 43 percent of the squatter conflicts (involving 75,600 acres) presented to it during that decade. And in the 1970s and 1980s the incidence of squatting (or *precarismo*) accelerated beyond the point that ITCO could properly keep up with it.<sup>17</sup>

The law and its results are important to consider here for the effects they have had on conservation efforts in Costa Rica. First, the law was designed to “contribute to the more just distribution of wealth” in Costa Rica by “avoiding the concentration of national lands in the hands of those who would use them for specialization against the general interests of the nation.” More important, the law delineated which areas of the country were *not* open for agricultural colonization. It established the authority “to determine what land should not be exploited by agricultural workers” and crystallized government policy to acquire and expropriate “those lands that were not fulfilling any social function” (i.e., not being used for agriculture). Oddly, the bill named these lands “State Agricultural Properties” even though they consisted primarily of volcanoes and other lands unsuitable for cultivation. Later amendments to the law added riverways, islands, and watersheds vital for the nation's hydrologic needs. None of these “national reserves” could be colonized, fenced, or plowed, used for any construction, or used to cut wood. And the law made very clear that any and all lands not under title of private ownership legally belonged to the state.<sup>18</sup>

ITCO, whose name was later changed to the IDA (Instituto de Desarrollo Agrario [Institute of Agrarian Development]), monitored the regu-

lation and enforcement of colonization policies. As a benefit to conservation efforts, the agency was staffed with personnel from MAG's Lands and Forestry Department, including four engineers trained in forestry from CATIE. Likewise, it was entrusted with the designation and development of nature reserves.

The first such reserve to be created was in 1965 at Cabo Blanco on the southernmost end of the Nicoya Peninsula in northwestern Costa Rica. But instead of being initiated by ITCO, Cabo Blanco was the unlikely result of the efforts of a Scandinavian couple who resided in the area. Olof Wessberg, a retired officer in the Swedish Air Force, and his Danish wife, Karen Mogensen, had moved to the peninsula in 1955 to live a simpler life and raise organic fruit. Acting on a life-long dream to leave the cold of northern Europe and to live in tropical America, Wessberg and Mogensen left Sweden to work on a farm in Ecuador. They later moved to Guatemala, California, and Mexico but never felt that those places satisfactorily suited them. Then, based largely on a dream Mogensen had one night, they decided to move to Costa Rica. After visiting several parts of the country, they settled at Montezuma at the southern end of Nicoya, bought land overlooking the gulf, and spent the next ten years raising over thirty varieties of fruits and coming to know intimately the flora and fauna of the region. Bill Weinberg, a journalist who became acquainted with Mogensen in the late 1980s, wrote that the couple "lived a life of vegetarianism and [had] a reverence for nature that bordered on the mystical, taking great joy in the company of monkeys and coatimundis."<sup>19</sup> The idyllic little world of Wessberg and Mogensen started to change very rapidly in the late 1950s, however, when larger and larger patches of cleared areas started to appear in the forests across the peninsula. They watched as hundreds of squatters moved into the region, cleared land for crops, and then sold out to lumber and cattle companies when the tropical rains eroded the cropland. Worried that the last remnant of forest habitat of their beloved wildlife would completely disappear, Wessberg contacted some wealthy acquaintances in California and requested that they purchase the land as a wildlife refuge. The friends declined but told Wessberg that he should contact international conservation organizations that might take up the cause. Acting on a late-night impulse, then, Wessberg wrote an appeal and sent it to various groups. He related how jaguars and tapirs were already extinct in the area and that rapid habitat

loss was endangering the populations of ocelots, pumas, deer, peccaries, agoutis, coatimundis, and several species of monkeys on the peninsula. "When we settled here six years ago the mountain was always green," Wessberg lamented in his appeal, "today it has great brown patches, and in March and April it is shrouded in smoke, much of it on fire. . . . Two years more, and the mountain will be dead."<sup>20</sup> In 1961 his appeal appeared in the magazine of the World League against Vivisection and for the Protection of Animals.

Donations for the purchase of Cabo Blanco soon materialized. The British World League against Vivisection contributed 51 percent of the funds needed, and other monies came from the Sierra Club, the Nature Conservancy, the Friends of Nature, and the Philadelphia Conservation League. The environmental groups, however, preferred to give their contributions to a government agency responsible for the conservation of the area. But the only Costa Rican agency empowered to expropriate land for such purposes at this time was ITCO, which had no experience in managing preserves. ITCO "was interested in helping farmers to get more land to clear—the opposite of what we wanted," complained Mogensen in a later interview, "they never did understand what it was all about." Three years later and after over twenty trips made by Wessberg to San José to deal with government officials who would not answer his letters, ITCO finally expropriated the land at Cabo Blanco and created an "absolute biological reserve"—the country's first nature reserve. During that time, however, more colonizers had moved into the area, and, upon hearing that the land might be expropriated, cut down more trees to "improve" the land by making it more suitable for crops. Mogensen recalled that "a lot of people here really didn't understand what the land was being expropriated for."<sup>21</sup>

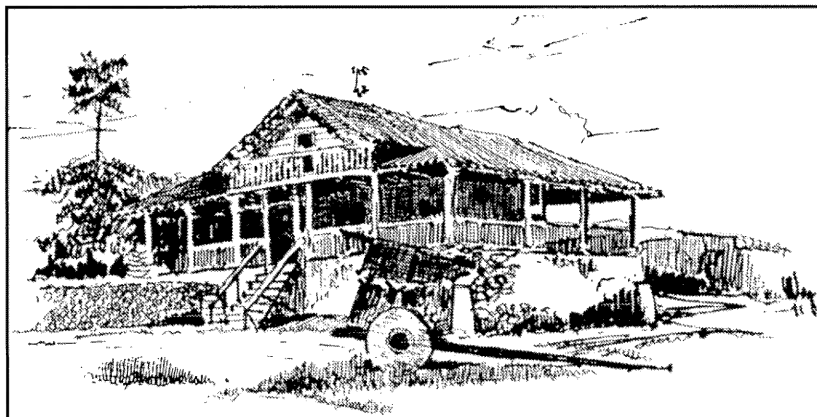
The next problem that Wessberg had to confront was in guarding Cabo Blanco. ITCO hired only one warden to monitor the entire reserve, who, according to Mogensen, was a big drinker. He also attempted to make a little extra money on the side by killing the last ten grey spider monkeys—found nowhere else in the world—for the oil in their fat that supposedly had medicinal qualities. Wessberg had him fired. Another warden felled trees inside the reserve to plant crops. After a few more journeys to San José to complain about these problems, the government allowed Wessberg to develop his own questionnaire to screen prospective

wardens. The system he used proved so helpful that by the early 1970s, when a national park service had been established, officials offered him an agency position there. He declined on the grounds that he had no desire to move to San José.<sup>22</sup>

Wessberg's last campaign for conservation on the Nicoya Peninsula came in the early 1970s when he lobbied for establishing an additional reserve around the town of Montezuma. He solicited \$500,000 from the International Union for the Conservation of Nature (IUCN) in Switzerland. Gerardo Budowski of Costa Rica was the director general of IUCN in those years but was forced to refuse Wessberg's request because it asked for "way too much money." He urged Wessberg to seek government approval and to have the University of Costa Rica and the OTS conduct feasibility studies of the project before the IUCN could consider such a request.<sup>23</sup> The project never materialized.

While Cabo Blanco became Costa Rica's first nature reserve in 1965, the next year marked the creation of the first national monument. The purpose in creating Santa Rosa National Monument, located on the Santa Elena Peninsula in the far northwestern corner of the country in Guanacaste province, however, was more as a means to preserve and tout the historical value of the area than as a measure to protect the tropical dry forest in which it was located. Santa Rosa had been a large working cattle ranch, but it was also the place where a volunteer Costa Rican brigade had defeated William Walker and his invading band of American filibusters in 1856. Walker, who entertained grandiose notions of establishing his own personal empire in Central America, complete with slavery (which had been abolished in the region) and English as the official language, was pushed back into Nicaragua, never to set foot on Costa Rican soil again. Thus the Battle of Santa Rosa had become a source of national identity and pride (as well as an important national holiday) for many Costa Ricans, especially for Guanacastecans. La Casona, the large hacienda near the battle site, survived as a monument to this important historic event (see Figure 6).

But Santa Rosa was "invaded" again in the 1930s when Nicaraguan strongman Anastasio Somoza García bought the hacienda as a personal ranch and investment. Never popular with democratic Costa Ricans, Somoza's presence outraged Ticos who over the years pressured the government to oust the dictator from the area. Not until 1966, however,



**Figure 6.** La Casona at Santa Rosa National Park (source: National Archives of Costa Rica, Servicio de Parques Nacionales series, file 19)

did the Legislative Assembly finally vote to expropriate 3,000 acres of Somoza's land surrounding La Casona. It then directed ICT to manage Santa Rosa as a national monument.

Seeing the historic and touristic value in preserving this part of Costa Rica's national heritage, ICT welcomed the opportunity and hired Kenton Miller, a CATIE parks planning specialist, as a consultant for the project. But Miller recognized that the tropical dry forest in which Santa Rosa was located (among the very last remnants of this ecosystem anywhere in the world) was being threatened by slash and burn agriculture and the expansion of livestock pastures. Thus the chance to extend protection over a larger area loomed very large for Miller, and he recommended that the government buy 30,000 acres of the fragile environment to be developed into a park. ICT backed the plan and the government eventually paid Somoza roughly \$500,000 for the land. In 1971 the status of Santa Rosa changed from national monument to national park—making it one of Costa Rica's first such designated areas.<sup>24</sup> National park status, however, was made possible only by the passage of the Forestry Law of 1969, the history of which is vital for understanding the subsequent history of conservation in Costa Rica.

### **Legislating Protection: The Ley Forestal**

Participants in, and students of, Costa Rican environmental policy making agree that the Forestry Law of 1969 was the key to future conservation

successes. Called the “principal milestone,” the “transcendental step,” and the “turning point” in the country’s conservation history, the Forestry Law’s impact on the rational use of forest resources cannot be underestimated.<sup>25</sup> Yet missing in the literature is any explanation of the history and career of the law, the mechanics behind its enactment, public reaction to its passage, and the changes it has undergone in the late twentieth century.

With the creation of Cabo Blanco Nature Reserve and Santa Rosa National Monument in the mid-1960s, concern developed in certain sectors of the government regarding the lack of comprehensive guidelines to administer protected areas and to conserve other forest resources. One official who was keenly aware of the problem and who worried about the impact of unregulated deforestation was Guillermo Yglesias, minister of agriculture and livestock in the administration of President José Joaquín Trejos (1966–1970). In 1967 Yglesias named an interdisciplinary committee to research the problem and to prepare a draft forestry legislation proposal. Heading the commission was stalwart conservationist Alvaro Rojas Espinoza, who had had successful experience in organizing and seeing to fruition the 1953 Soil and Water Conservation Law and the 1961 Law of Lands and Colonizations. Representing government agencies on the commission were members from the Ministry of Industry and Commerce, the National Committee for the Conservation of Natural Resources (dominated by the hunting and fishing organizations), the electricity institute (ICE), and the Institute of Lands and Colonizations (ITCO). From the private sector were representatives from the Agriculture and Stockgrowers Association and from the Wood Industries Association. And representing the University of Costa Rica was forest ecologist Luis Fournier, who, Yglesias stated, had “an enormous understanding of forestry management.” Professor Fournier later remembered, however, that he felt like “*un golondrino solo*” (a lone swallow) on the commission because of his more active position for environmental protection.<sup>26</sup>

The special commission worked for nearly a year on the proposal. During that time the members consulted the forestry laws of Venezuela, Mexico, and the United States and hired forestry consultant Nestor Altuve to help draft the legislation. Altuve was a Venezuelan forestry specialist who had helped pass protective legislation in his home country, had been chief of the Venezuelan forestry service, and at this time was employed as a silviculturist with the UN’s Food and Agriculture Organization (FAO)



in Rome. On 14 June 1968 Guillermo Yglesias sent the commission's proposal to the Legislative Assembly. In an accompanying letter, Yglesias explained that the proposed legislation was "for the defense, conservation, and safer exploitation of our renewable natural resources." He asserted that the country had "been waiting over seventy years" for such a policy and that ever since Law No. 36 of 1906 (which authorized the executive branch to create national forestry guidelines), there had been many initiatives and orders but nothing that had ever become a concrete national law.<sup>27</sup>

What the commission's proposal called for, then, was the legal sanction for the state "to ensure the protection, conservation . . . and development of the country's forest resources." To that end, the law would establish a General Forestry Directorate (DGF) within the MAG to "administer the forest patrimony" and "to provide technical support to the wood products industry." Additional MAG duties would include creating protector zones, working to conserve wildlife, combatting soil erosion, controlling forest exploitation, and providing forestry education. To advise on such issues, the law would create a Forestry Council with members selected from the various government agencies involved with land and resource issues. The law would outline regulations for the felling, transporting, and marketing of timber from the country's forests and would establish penalties (stiff fines and jail terms) for policy infractions. It mandated that there be no livestock grazing on public lands without the written approval of the DGF. And, vital for the more organized designation and management of protected areas, the law would define and provide for the creation of a system of national parks to be administered by the DGF. Lands defined as national parks, forest reserves, and protector zones would be off-limits for agricultural colonizations.<sup>28</sup>

In trying to sell such a proposal to members of the Legislative Assembly, Yglesias stressed the economic benefits that would accrue from the bill's approval. After all, much of the bill's intent was directed toward the concept of "multiple use" and was similar in many ways to the public lands management language of U.S. conservation policy. Article One, for example, suggested that the law would be for protecting and conserving the forests, but also for their "exploitation . . . and development . . . in accordance with the principle of multiple use of renewable natural resources." Yglesias noted that the law would "assure the best exploitation of the forests for the benefit of a more dynamic economic development

of the agricultural sector." He argued that because of Costa Rica's high rainfall and mountainous topography, protecting the forests, and therefore the soils, would be "one of the most promising economic activities" that the nation could undertake.<sup>29</sup>

In accord with Costa Rican legislative procedure, the proposed law was sent to committee before being debated in the Assembly as a whole. It went to the Permanent Commission on Government and Administration, where proceedings opened on 19 August 1968. Guillermo Yglesias was called on to introduce the proposal. "There has been a general anxiety among Costa Ricans," he began, "about putting order and regulation to the irrational exploitation that our forests are undergoing at this time." He then asserted that "in reality, if we continue in the steps we are now taking, within a few short years Costa Rica will not have any wood, we will not have any forests to exploit." Yglesias stressed that supplying guards in the forests (a strong FAO recommendation) was one method to start counteracting abusive forest practices. When one commission member asked him why the Executive Office could not just authorize the appointment of forest guards without going through the legislative process, Yglesias responded that this was impossible without the legal authority of a law on the books. "I expect enormous reaction from the woodcutters," he admitted, "and from the people who are taking advantage of the forests . . . [and] are making lots of money from it, because this law will end that."<sup>30</sup>

When the legislative commission next met to consider the Forestry Law, the members heard from Luis Fournier and others on the proposal team. Fournier minced no words: "You're becoming more aware of irrational forest exploitation. . . . [Even] a superficial land analysis of Costa Rica shows that only fifty percent [of the country] remains in forest." And he stressed how the inconsistent and rivalrous nature of having five or six government agencies involved with different aspects of land management was leading to the "atomization" and "anarchy" of conservation policy. He noted that there would be "good incentives" and "stimulants like tax relief" to encourage landowners to cooperate. In terms of enforcement, he related how the committee estimated that 300 forest guards and twenty-five support staff would be needed.<sup>31</sup>

In order to gauge regional reaction to the proposed bill, the legislative commission solicited responses from municipalities around the country. Many municipal leaders and town councils mailed or wired in straw

votes taken on the bill and most were favorable in nature. Typical of many was the response from the municipality of San Pablo Turrubares, stating that the law would give nothing but benefits for future generations. "It is an injection of fresh air in the continual fight for a better and more fertile Costa Rica. . . . The natural resources are a source of incalculable value . . . [and] an immense treasure."<sup>32</sup>

Statements of support also came in from the minister of industry and commerce and from international experts in the conservation field. But much of the support came in the form of backing the proposal for its economic benefits. Dr. Herster Barres, a forestry official with the FAO, testified that Costa Rica's population was estimated to double by 1988 (it nearly did) and that well-managed forests would mean that more paper products and books would be available for the people. He also stressed that Costa Rica's economy would benefit from such paper-hungry giants as Europe and Japan, as their demand for pulp would increase over the years.<sup>33</sup>

Likewise, there was strong opposition to the proposal. Conflict developed around the duties of the colonization institute (ITCO) and the tourism council (ICT) in distributing or managing government lands. The problem was in the identification and designation of "lands not suitable for agriculture," which ITCO was often in the habit of distributing and which conservationists believed should be protected. Under the new forestry law, such lands could fall into preservation categories that officials at ITCO believed should only be in their jurisdiction to determine and officials at ICT believed should only be in theirs. ICT director Richard Castro argued that the law that created his agency in the mid-1950s "authorized [it] to declare which zones [would become] national parks" and that Santa Rosa National Monument was in its "custody" and being managed just fine. Opposition also came from certain private sectors that stood to lose from the law. The Costa Rican Construction Association, for example, lobbied against the proposal.<sup>34</sup>

Opposition notwithstanding, the Permanent Commission on Government and Administration unanimously approved the proposed forestry law and sent it to the Legislative Assembly on 29 April 1969. It had been in committee for ten months and lasted in the Assembly as a whole for seven more. During that time the legislature received an unprecedented outpouring of petitions, letters, and telegrams from various sectors of the country in support of a national conservation policy. A

twenty-two-page petition, for example, was sent from students of the Coto Brus and Osa Agricultural College in southern Costa Rica urging members of the legislature to pass the law. The students declared that they “could not continue celebrating the National Week for Natural Resources if the forests, waters, soils, wildlife, and places of scenic beauty continue to be subjected to increasingly more intensive destruction.” And the president of the prestigious Association of Biologists (Colegio de Biólogos) of Costa Rica sent notice to the Assembly that his organization was in complete support of the measure.

Schoolchildren across the country also sent many letters and telegrams to the Legislative Assembly urging members to vote for the proposal to protect forests and natural resources. Indicative of many was a telegram from the high school students of the Liceo Rodrigo Facio stating, “We desire a better future for us via a forestry law that will also improve the economy of our beloved Costa Rica.” Others wrote supporting the law as a means to preserve the woods, the animals, and the birds that represented the country’s natural heritage.<sup>35</sup>

The media had a less active role in supporting the cause, but *La Prensa Libre* openly campaigned for its approval. In a long editorial published on the day the bill was to come up for a vote (25 November 1969), the paper endorsed the law and urged Assembly members to support it. It praised the measure as “an important legal instrument . . . to stop the axe from continuing its destructive work” and the only hope to “save [our] natural resources for future generations.”<sup>36</sup>

Opponents were against the law for a variety of reasons. ITCO sent word to the Assembly members that more time was needed for its attorneys to study the proposal and how it would affect land colonization efforts. Private citizens wrote that the government had no business setting aside certain areas of land. Representative of these individuals was Rodrigo Salas Retana from Guadalupe, who noted that “it’s not like Costa Rica is a big country like the United States. We do not have that much private land; we are not big enough for this, even though [many people] just see San José and think we’re huge.”<sup>37</sup> But the opposition was the minority opinion. On 25 November 1969 the plenary session of the Legislative Assembly passed Law No. 4465, the Ley Forestal.

Public reaction to the creation of the framework that would protect Costa Rica’s forests and establish national parks was modest at best. The Forestry Law came to a vote when the Assembly found itself, as one news-

paper put it, "in the biggest of squeezes"—when it had "never been in such a tight spot with so much pending legislation."<sup>38</sup> Perhaps that was part of the reason that the country's largest newspaper, *La Nación*, did not report the law at all on the day it passed and waited two days before ever mentioning it with a small article on page 44. The paper's "capitol hill"–style legislation column never did mention the Forestry Law. Bigger legislative news was the debate in the Assembly to finance a sport center in San José. Part of the reason also lies with the breaking news stories of the day with which the new conservation policy had to compete. Newspapers logically gave far more coverage to such national headline events as the tropical storm and flooding that caused a great deal of destruction in southern Costa Rica and to the José Figueres presidential campaign.

Likewise the media gave more attention to such international topics as the successful landing of Apollo XII, the unraveling of the tragic events surrounding Lieutenant William Calley and the My Lai massacre in Vietnam, antiwar protests and hippies in the United States, the continuing saga of violence between Honduras and El Salvador, and a deal between Anastasio Somoza and Aristotle Onassis regarding the "canalization" of Nicaragua. Ironically, on the days surrounding the creation of a law to protect forests, *La Nación* ran large display ads for Steyr Tractors that could "conquer the Costa Rican countryside" and for Volvo logging trucks (called *madereros*), which were supposedly superior to their competitors for hauling huge logs in the rough mountainous terrain. And even campaign ads for José Figueres promised "land for everyone" and acknowledged that "the demand for land exists" and that the government had "only started to satisfy it." The only newspaper to report on the Forestry Law on the day of its approval by the Legislative Assembly was *La República* in a short article on page 13. *La Nación* ran an article concerning the law two days later and quoted President Trejos at the signing ceremony. "The step that has been taken with this law," he began, "is transcendental for the progress of Costa Rica . . . [and] means a great deal for the rational exploitation of forest resources."<sup>39</sup>

"Rational" is not always the word that can describe forest use since the passage of the Forestry Law in 1969. Deforestation has left its ugly mark on the Costa Rican landscape—much of which has occurred since the law went into effect. *Precarista* squatting increased in the 1980s and only recently has slowed to some degree. Logging continues in restricted areas that are inadequately patrolled, and the nation's forestry policies are still

enforced with insufficient funds and fewer personnel than needed. A green ethic does not yet pervade the business community and is especially absent in the forest extractive industries.

Yet one must bear in mind the alternative and ask what directions land use might have followed without the Forestry Law. In that light, then, it becomes easier to see how the law can be viewed as a success in other dimensions of conservation. That it provided the vehicle to set aside areas as national parks and biological reserves has been its most successful benchmark. It is to that dimension that we must turn next. But in understanding the career of the law—and it indeed has been a long and multifaceted one with revisions and reforms groaning through the legislative process in 1977, 1980, 1986, 1990, and 1996 (the last of which will be discussed in Chapter 8)—it is clear that it was the initial and most important step of the conservationist response to the environmental problems so besieging the nation by the end of the 1960s.