

THE FOUNDING OF CANADIAN ORGANIZATION FOR TROPICAL
EDUCATION AND RAINFOREST CONSERVATION (COTERC)

Report of a Major Project Submitted
to the Faculty of Environmental Studies
in Partial Fulfilment of the
Requirements for the Degree of
Master in Environmental Studies

AND ACCOMPANYING VIDEOTAPE

by

MARILYN COLE

YORK UNIVERSITY
NORTH YORK, ONTARIO, CANADA

JANUARY, 1994

Marilyn Cole

Leesa Fawcett, Major Project
Supervisor

TABLE OF CONTENTS

FOREWORD	PAGE 1
INTRODUCTION- HOW DID I GET INVOLVED IN THE FIRST PLACE?	PAGE 2
CHAPTER ONE - BACKGROUND	PAGE 5
CHAPTER TWO - COTERC - THE BIRTH OF AN ORGANIZATION	PAGE 10
CHAPTER THREE - CANO PALMA BIOLOGICAL STATION	PAGE 21
CHAPTER FOUR - PROGRAMS	PAGE 29
CHAPTER FIVE - LOOKING AHEAD	PAGE 34
POSTSCRIPT	PAGE 36
ACKNOWLEDGEMENTS	PAGE 37
BIBLIOGRAPHY	PAGE 38
APPENDICES	PAGE 41

FOREWORD

My plan of study outlines a major project in which I describe the creation of a non-profit organization named Canadian Organization For Tropical Education and Rainforest Conservation (COTERC). The accompanying report documents the rationale for, as well as my role in the development and structure of this organization, as co-creator.

As my thoughts regarding my major project have evolved and changed, I feel that my choice of Quadrant A is the correct one. In order to carry on with my goal of "neotropical wildlife protection", it will become increasingly necessary to investigate alternative methods to that of destroying the rainforest, through environmental education and sustainable development projects, and through fostering ongoing research on the flora and fauna specifically of Costa Rica. Therefore, practice in intervention becomes a major factor, but this cannot be achieved without the theory, making an overlap into Quadrant C.

In preparation for satisfying the requirements for a Masters in Environmental Studies degree, I outlined the following learning objectives:

(a) Basic knowledge of the government regulations regarding non-profit organizations in Canada;

(b) Detailed knowledge of the goals, objectives and strategy of COTERC, with rationale for each;

(c) Knowledge of the marketing role in a non-profit organization and, specifically, COTERC;

(d) Knowledge of international environmental issues as they pertain to wildlife in general;

(e) Knowledge of wildlife regulations (conservation, use, etc.) as they pertain to Costa Rica;

I believe that I have accomplished these learning objectives, and the accompanying report reflects this opinion.

INTRODUCTION: HOW DID I GET INVOLVED IN THE FIRST PLACE?

In order to provide an understanding and rationale for the major project itself, I must necessarily delve into my personal life so that a framework can be developed for what has transpired before and after my entrance into the Faculty of Environmental Studies program.

Ever since I can remember, I have felt an affinity with animals, as do many impressionable young girls. In my younger years the household pets (dogs, cats, hamsters, rabbits and yes, even snakes) satisfied this yearning to "commune"; in fact, it was easier to associate with animals than with humans. In my teen years a passion for horses developed, which became all-consuming, culminating in the purchase of my very own horse at the tender age of twenty-one.

As the years went by and I found myself bored to tears in mundane secretarial work, I turned more and more to the animal kingdom for some type of inner personal satisfaction, resulting in the ownership, training and showing of numerous horses, dogs and cats. Personal relationships (some short, some long) came and went, but animals were always my constant companions; however, during this entire period I never really considered the broader implications. What would life be like if there were no animals to share it? Is it possible that humans could destroy so much of the planet that animals (particularly wild ones) could disappear?

At the rather advanced age of thirty-two I decided that a career change was in order, and applied for psychological testing to see what I might be suited for (other than pounding a typewriter). A zookeeper? What a novel idea! How fortunate that the Metro Toronto Zoo was in its infancy and was looking for people such as myself, with a background in animal management to fill its numbers. On October 8, 1973 I began work as a keeper and my life changed forever. Suddenly I found myself in an environment where everyone cared about the animals, albeit caged and unable ever to roam wild and free. I was no longer thought to be a bit strange by my co-workers. In fact, some of them were much stranger than me!

My first days were spent learning husbandry and feeding techniques. Just how do you persuade a lizard to eat its mealworms? And why is it necessary to provide extra Vitamin C for a marmoset? Why do the sarus cranes need to be quarantined? So many new things to learn and I was totally enthralled by the male and female orangutans Mingo and Puppe. I became obsessed to learn all I could about these fascinating creatures in particular, and primates in general. This obsession led to a six-month sojourn in the Bornean jungle to observe their daily lives, to attempt to understand them more fully so that I, as a caregiver

to their captive cousins, could do a better job. So much more transpired and developed within me as a result of that experience. How can I ever convey my wonder of the natural world, the terror of being lost for three days, or the utter joy I felt when a wild mouse deer walked cautiously up to me, sniffed and then unconcernedly sauntered away? These and dozens of other memories from that trip guided and inspired me to dare to do more. From that event in 1975 my attitudes have been shaped to appreciate the natural world for itself, rather than as a tool for humans.

As a zookeeper, I have been forced to analyze and defend myself as a caregiver of wildlife in captivity; Jenkins (1990, P.14) faced a similar dilemma and explains the necessity of stewardship once an animal has passed into human hands. Because I care deeply about wildlife, I wanted to support various conservation "causes", but my focus continued to be primarily on non-human as well as human primate behaviour. Academically I applied this interest in attaining a Bachelor of Science degree in Physical Anthropology as a part-time student, from University of Toronto in 1987. Meantime, my area of work at the zoo shifted from orangutans to gorillas.

Attendance at various conferences and presentation and publication of papers dealing with aspects of primate husbandry honed certain skills, while I learned to look at the broader picture and to realize that it was not enough to protect animals in captivity. I came to understand biological diversity as

"the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems".¹

Definition used by the International
Convention on Biodiversity

Only by protecting habitats could biological diversity be considered an option. What better way to approach this topic than to enter the Faculty of Environmental Studies at York University? And what better way to pursue my studies than to develop a plan of study proposing to look at the effects of human encroachment on the lowland gorilla in the West African country of Gabon? Thus, considering my background I felt well equipped to build on my previous knowledge.

How, then did I end up with a major project revolving around neotropical wildlife protection? A casual conversation led my husband and I to apply to be research assistants on a sea turtle project located near the village of Tortuguero on the northeastern coast of Costa Rica. For a month of the summer of 1990

we spent our nights patrolling the nesting beach, locating leatherback turtles, recording their nest sites, weighing and tagging them, and watching them return to their watery homes. The sight of these magnificent creatures carrying on as they had for millennia never ceased to bring tears to my eyes. The area became a paradise to us, despite the obvious poverty of the local inhabitants. When we were offered an opportunity to purchase a tract of tropical rainforest nearby, we unhesitatingly jumped in with both feet. I can still recall the enormity of the feeling when I first gazed upon the property and thought to myself that finally I was participating in active conservation. Here was my opportunity to make a difference. How naive and simplistic it all appears in retrospect. But perhaps it is just as well. I doubt if I would have had the courage to start if I had realized the obstacles needed to be overcome.

Thus, even as I was entering the Faculty of Environmental Studies in the fall of 1990, my focus was shifting towards neotropical wildlife protection, and my plan of study necessarily changed and altered with it.

If I had the opportunity to do the major project over again, the primary change I would wish to make is to devote my entire time to the project, instead of attempting to fit it in while working full time at the Metro Toronto Zoo. The lack of time necessarily made the entire undertaking much more difficult, and shortcuts had to be taken. Some important contacts were not followed up. In order to keep on top of all aspects of COTERC, I find that I must devote a good deal of time talking on the telephone. Fundraising, in particular, has suffered and without fundraising some very creative and useful suggestions could not be implemented due to lack of available money.

Again, for lack of time, my intention to become fluent in Spanish has been hampered. I continue to study Spanish separately from my studies at York University, but really require more time to participate actively in a conversational environment, rather than in a formal classroom setting. An immersion course living with a Costa Rican family would be the ideal situation.

However, overall I am pleased with the progress made to date. In two short years COTERC is beginning to be known for its conservation and research work throughout North America and Costa Rica.

CHAPTER ONE BACKGROUND

The Challenge of Conservation

Who today is not aware of the world-wide concern for our planet's environment? One can hardly pick up a newspaper, or turn on the television without hearing some new and terrible statistic about the ozone layer, the pollution of both waters and land, the ongoing rainforest destruction. The list goes on and on, with portents of imminent doom.

"The human race has steered the planet Earth toward a serious state of imbalance, and no one can afford to ignore the fact that we are probably entering a period of unprecedented environmental crisis. Throughout the world, the very means by which all people can survive and prosper are being destroyed."

Collins, 1990, p. 176

Rainforests figure heavily in this problem because they are vital on many levels -- on a global level they regulate climate and hydrological cycles; they provide water for over one billion people; when burned, huge amounts of carbon dioxide are released, affecting our temperature (Collins, 1990, p. 34).

Rainforests are the home to many indigenous peoples who struggle desperately to hold on to their traditional lives in the face of modern technology, progress and what we term "civilization".

Rainforests are the repository for the majority of the world's genetic diversity, much of which is still unknown to science. It is argued that the plants contained within rainforests have generated compounds of medicinal value to humans and that fewer than one percent have been tested to date. Latin America is said to be the richest in biological diversity (Collins, 1990, p. 32). Costa Rica ranks tenth in terms of biological diversity in neotropical countries with the highest numbers of species of mammals (203) and birds (796); ranks eighth in amphibians (150), seventh in reptiles (218) and tenth in angiosperms (8,000) (McNeely et al, 1990). The interdependence of many of these creatures is only now coming to light. For example the Caecropia tree found in Costa Rica and other countries provides a home in its hollow branches and nectar for the non-stinging Azteca ant, who in turn keeps the tree free of strangling vines and epiphytes (Collins, 1990, p. 65). Destroy the tree and the ant too will disappear.

"And all things are ordered together somehow, but not all alike, both fishes and fowls and plants; and the world is not such that one thing has nothing to do with another, but they are connected."

Aristotle
from Metaphysics

All of these arguments for preserving the rainforests are based upon human needs, and are the traditional arguments cited by authorities (Pister, 1979). One could easily despair, throw up one's hands and say that an individual cannot make a difference. Indeed, for many years this was my very sentiment. But I was, and continue to be, concerned primarily with the fate of wildlife. John Livingston's book (1988) and personal conversations as my previous primary advisor caused me to ponder over terminology and concepts which I had previously accepted verbatim. Discussions in his Biological Conservation II course assisted me in shaping and developing my goals and ideals.

Most, if not all, species are important links in the balance of ecosystems. Wildlife is a potential food source. Some species (particularly primates) are studied in detail because they are considered to provide insights into human behaviour. They provide clues to human and animal evolution. Most, if not all, species are important links in the balance of ecosystems. Some people consider the exhibition of wildlife important as a means of educating visitors. Others consider it important to maintain the genetic diversity of species for future propagation. We tend to view the natural world in anthropocentric terms only. Indeed, Livingston (1988) eloquently refers to the attitude of "use" of wildlife: "By its very emphasis on the utilitarian imperative, the latter drives the conceptual wedge between man and nature ever deeper, thus reducing the possibility of the achievement of wildlife preservation in the ideal sense". He goes on to argue that we do not view wildlife as having any intrinsic worth. From a purely selfish point of view, I would feel a great sense of loss if it were not possible ever again to watch a spider monkey swinging carefreely through the forest canopy, or to hear the morning calls of the toucans. We are an arrogant race, believing ourselves to be superior to the animal life around us, thinking that it exists only to serve our own needs, and that it can be disposed of according to our whim.

Conservation in Latin America

In order to gain a greater appreciation of problems confronting various nations, I studied a variety of viewpoints regarding what constitutes "development" during the coursework of

"International Development Theory". The emphasis was on a re-examination of conventional approaches to development and alternative concepts of and strategies for development. I read articles expounding the virtues of Marxism; a Japanese advocate of self-sustainment; capitalism; imperialism; women and the natural world, to name but a few. These were philosophies that I had previously ignored, feeling they had little relevance to my world. But gradually I realized that they were indeed relevant, if for no other reason than to make me aware that many people had no concerns whatever regarding conservation -- only utilizing natural resources for economic gain, such as can occur in a capitalist system, while a few proponents advocate a harmony and balance with nature. The course thus provided a base on which to reflect upon the path taken by the government of Costa Rica, the focal point of my major project.

What we term Third World Countries are fraught with economic and social problems. Very often governments are unstable, the bureaucrats concerned only with lining their own pocketbooks. In my own travels I have witnessed extreme poverty, unspeakable cruelty to animals, and an uncaring attitude about conservation. "Ecology in Third World Development" tended not only to augment my disillusionment, but to place my personal attempts in perspective. My term assignment paper on the important role that animals play in seed dispersal helped me to focus on this vital aspect of the ecosystem, and to appreciate it more fully.

The countries comprising Central America make up a land bridge between very distinct ecosystems and consequently are home to one of the richest habitats on earth, in terms of numbers of species contained. Panama has 700 different species of birds -- more than all of North America (Collins, 1990, p. 102). Belize, Guatemala, Honduras, El Salvador, Nicaragua and Mexico all suffer from internal strife. Population pressures, poverty, social unrest are the norm, rather than the exception in these countries -- hardly conducive to conservation. The field course "Sustainable Tropical Coastal Development" took me to Mexico in 1991 where I witnessed firsthand the results of inept development programs leading to rainforest destruction on a massive scale. What little tropical rainforest that was left was being considered for future development, not conservation. On one particular day our bus travelled through mile after mile of choking smoke generated from the burning of fields as far as the eye could see. It was a sobering image not soon forgotten.

In contrast to this bleak portrayal, Costa Rica has a long and enduring history of conservation. As long ago as 1845, its importance was known (Fournier, 1991). Scientific studies of the flora and fauna have been conducted by many researchers in many of the more accessible areas, both by Costa Rican universities and foreigners, and in 1963 the American-operated Organization for Tropical Studies was formed. They remain the single largest

consortium of researchers, but one must be affiliated with their member universities in order to utilize their facilities.

In 1966 Universidad de Costa Rica established a formal program entitled "Conservation of the Rainforest and Silviculture". Other Costa Rican universities soon followed with their own courses. In 1967, the Costa Rican government passed a law in Congress to regulate deforestation, and this law was soon followed by others; for example a government body known as CONICIT was established to map and delineate the forested areas in 1972. The establishment of numerous national parks, biological reserves and wildlife refuges followed under the management of the National Parks Service, and presently it is estimated that they cover 13% of the country's area (Dudenhoefer, 1993).

The small Central American country of Costa Rica (population 2,416,809 (Edelman & Kenen, 1989) has historically been set apart from its warring neighbours to the north and south. It has been a democracy for over one hundred years, abolishing its army in 1948 (Blake & Becher, 1993). Its former president Oscar Arias (1986-1990) took a leading role in establishing a peace plan in Central America, winning the 1987 Nobel Peace Prize (Arias, 1989(a); 1989(b)). While admittedly there is a great deal of poverty even today, the literacy rate is 93%; life expectancy is 73.0 years; and unemployment is 6.1% (Edelman & Kenen, 1989).

Costa Rica, although small in size, contains several diverse ecosystems ranging from Tropical Subalpine Rain Paramo above the tree line in the highest peaks, to Tropical Premontane Moist Forest in intermountain basins, from Tropical Dry Forest in the Nicoya Peninsula to the Tropical Wet Forest found in the Tortuguero area (Hartshorn, 1983). Tropical Wet Forest, or Atlantic lowland Rainforest (Appendix 1), is the most species-rich Life Zone in Costa Rica, containing multiple strata ranging from canopy trees typically 45-55 m tall, with stilt-rooted palms dominating the lower layers along with ferns and herbs (Hartshorn, 1983). Tortuguero is the nesting site of three species of endangered sea turtles (Chelonia mydas -- green turtle, Eretmochelys imbricata -- hawksbill turtle plundered for tortoiseshell jewellery, and Dermochelys coriacea - leatherback turtle, largest of all sea turtles (Carr, 1983). The endangered great green macaw (Ara ambiguus) flies here seasonally to gorge on the ripening fruit and nuts to be found in the region (G. Mayne, Personal Communication). The list of fauna found in the area is spectacular: three species of monkeys (Alouatta pallia - howler monkey; Ateles geoffroyi - Geoffroy's spider monkey; Cebus capucinus - white-faced capuchin); freshwater turtles, endangered crocodiles and caiman, manatees, sloths, morpho butterflies, poison arrow frogs, Honduras white bat, tent-making bat and many other like species; the Cano Palma river harbours the prehistoric gar fish, while the nearby Caribbean contains sharks, tarpon and snook (Blake & Becher, 1993). Indeed, 120 species of

mammals, over 300 bird species and more than 100 species of reptiles and amphibians have been documented. The final list of tree species could reach 300-500. (Anonymous, 1990).

The Tortuguero region receives over 5000 mm. of rainfall per year providing conditions for proliferation of dense tropical rainforest. The Tortuguero area, with the continuous tracts of tropical forest in the Barra del Colorado Wildlife Refuge and adjacent Nicaragua constitute the largest area of lowland New World tropical forest outside the Amazon basin. The International Union for Conservation of Nature has designated a similar area in Brazil as one of the world's "hot spots", i.e. in danger of disappearing. It is a given that this area, and the biological diversity contained therein must be preserved.

"We can save the world - if we have a mind to- but time is short. The earth can provide, but the laws of nature are strict and the penalties for breaking them catastrophic"
Collins, 1990, p. 177

CHAPTER TWO COTERC - THE BEGINNING

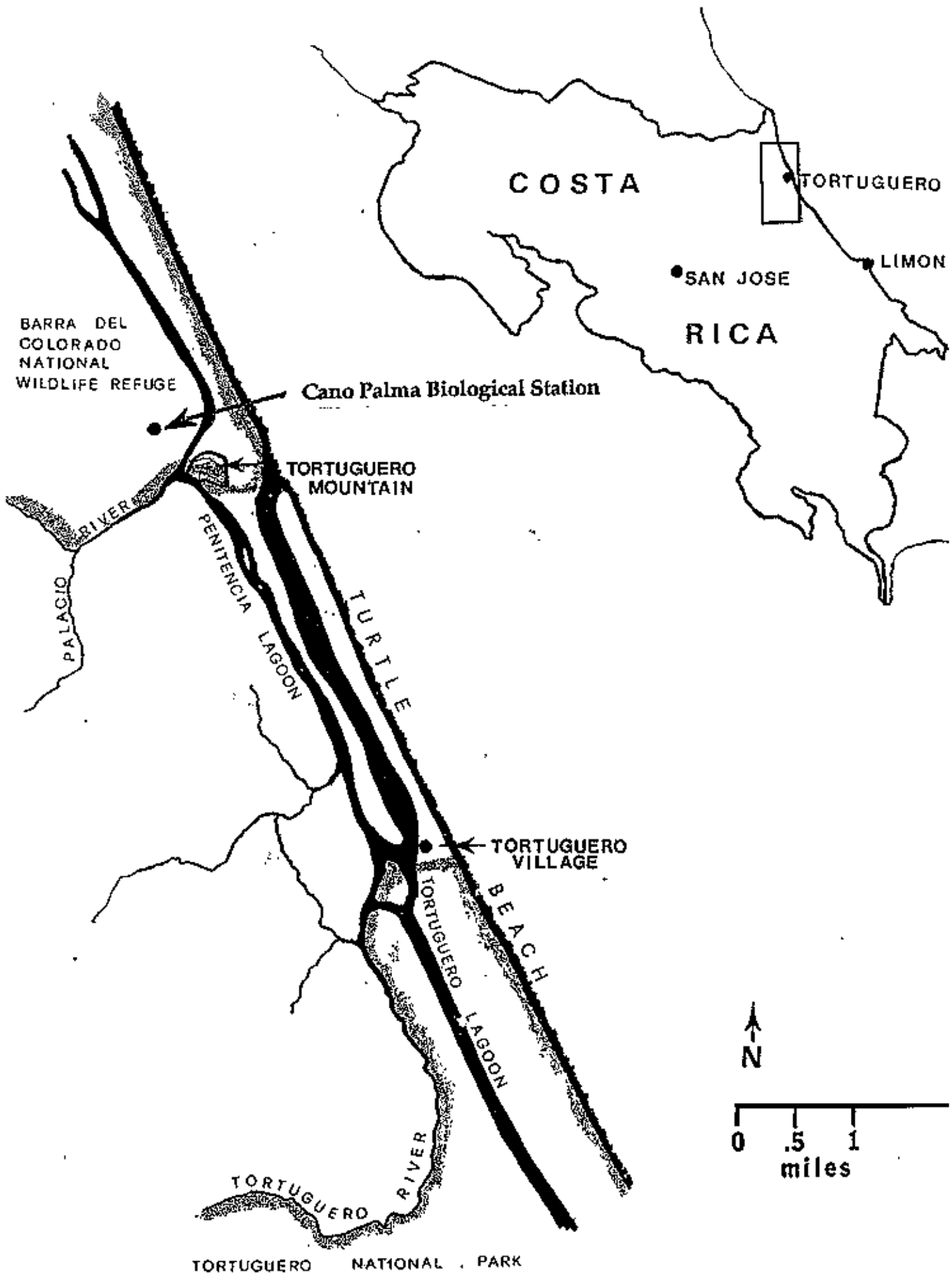
Costa Rica has become world-renowned for its parks system and leadership in conservation. Examples of groups such as Arbofilia (helping campesinos, or squatters, to reforest their land); and The Audubon Society of Costa Rica (which concentrates on restoration of habitats for migratory birds indicate a healthy concern for the environment.

One might assume that Costa Rica is doing very well with regard to the management of its natural resources. Why, then, is another conservation organization needed, and a Canadian one at that? The answer lies in facts overlooked by the the statistics listed in Chapter One. They do not reflect the deforestation that continues unchecked in many areas. At a rate of 4% annually, Costa Rica has the dubious distinction of having the second highest rate of deforestation in tropical America (McNeely, 1990). In 1950 Costa Rica's forests covered 72% of its area. Today the figure is 26%. It is estimated that by the year 2000 all the forests will be gone (Blake & Becher, 1993). It takes but one plane ride from the capital of San Jose to the small northeastern coastal village of Tortuguero to realize the extent of the devastation. Unplanned expansion of agricultural projects (primarily cattle, bananas and logging), spurred on by generous bank loans, are largely responsible in the past. Today it is hotel development that is largely to blame (Tico Times, December, 1993). Like most countries today, Costa Rica is faced with a financial crisis. They have been unable to meet their obligations to the International Monetary Fund. The National Parks Service is woefully understaffed to patrol the "protected" areas. There is little or no money available for even the simplest equipment, such as a booth at the entrance to a park to collect a fee from visitors and to explain the rules.

During journeys to the Tortuguero region (Figure One), I myself have witnessed illegal logging; the cutting of large areas of palm leaves to be used for thatching material at local hotels; the trapping of monkeys to be sold as pets.

The Costa Rica government is not to be blamed. The various departments work very hard, but are not well coordinated between departments. Sometimes their work overlaps and sometimes issues drop between the cracks. The Minister of Energy, Mines and Resources and all his appointees change when the government changes (every four years), so there is a certain lack of continuity. Independently-owned property is not as likely to be as susceptible to changes in the government.

FIGURE ONE



Rainforest can be protected only if it is patrolled regularly, to stop destruction before it happens. Squatters have rights in Costa Rica and can own the land which they have claimed for minimal subsistence farming, after cutting down the primary growth. I have witnessed a number of families doing exactly this on what is ostensibly land belonging to the Barra del Colorado Wildlife Refuge. Quite simply, there has been no government personnel available to keep them away. Thus, it is necessary to patrol land frequently, to ward off squatters, and this can be done more effectively when an independent organization such as Canadian Organization For Tropical Education and Rainforest Conservation (COTERC) can hire an individual to guard the property, as we have done.

Protection of the flora and fauna is interwoven with protection of property. In order to protect the flora and fauna, one must know what is there, by proper and appropriate scientific research of the lifeway patterns of each individual species. Caribbean Conservation Corporation (CCC) has been carrying on sea turtle research in the Tortuguero region since 1960, but the great wealth of other biological diversity there has remained virtually unstudied to this day. There is a great need to increase the depth of the knowledge of the inhabitants of this vital ecosystem while there is still time to do so. Thus, there is not a duplication of goals between the CCC and COTERC.

International groups such as the Nature Conservancy have purchased large tracts of rainforest by funds generated through foreign contributions in other regions of Costa Rica. The Costa-Rican based group Fundacion Neotropica has similarly purchased property in the Tortuguero region, but has had difficulty in keeping squatters out and preventing illegal logging, due to a lack of staff. The objective, then, is to hold tropical rainforest independent of the government and have it protected by individuals who live on the property and have an interest in its protection. Canadians have long been active as conservationists in the world community, but mostly played only an indirect role in Costa Rica, through contributions to organizations such as the Nature Conservancy. With the establishment of COTERC, and the research facility known as Cano Palma Biological Station, it is now possible for Canadians to take a more active part.

After its purchase, the property (which became known as Cano Palma Biological Station) was vulnerable to poachers and squatters if left unattended. Thus, we needed to develop a method to proceed in a more structured manner and to develop a base of support both financially and scientifically to carry out the goals of wildlife protection and non-invasive research.

Legalities

We were very keen to conform to the Costa Rican laws, and therefore sought the advice of a lawyer in San Jose, Rolando Chacon Hernandez. He had done the paperwork to purchase the property originally, so it was only natural to return to him. He then formed Cano Palma Biological Station S.A. It wasn't until some time later that I discovered that the letters "S.A." are equivalent to a limited company in Canada; several of the local inhabitants enquired about this use if we were supposed to be non-profit, and the letters "S.A." caused a great deal of confusion until they were removed from the signs. Rolando informed me that the company did not in fact own the property anyway. In retrospect, I wonder why we needed to form it at all. Since then, a Costa Rican application has been granted for charitable status in the name of COTERC.

On Rolando's advice in 1991, we also applied for a licence from ICT, the Costa Rican tourist agency, so that we could legitimately charge guests for accommodation. The status of the licence, apparently is still pending. It is also necessary to register ownership of boats, no matter how small. This work was also turned over to Rolando, who assures me that everything is "under control". I expect it is, and have come to accept that things work differently in Costa Rica. These procedures are also rather expensive. Nevertheless, despite these setbacks, Rolando has more than demonstrated his apparent worth. Just recently, he assisted with an application to the Department of Energy, Mines and Resources required under a new law passed in 1992. And, oh yes, the Minister happens to be a relative of his! In Central America, this family connection is of paramount importance when making one's way through bureaucracy.

Canadian Legal Requirements

Canadian Organization for Tropical Education and Rainforest Conservation (COTERC) was formed with the intention of evolving into an entity that could survive independently from the two principal participants. Stability of purpose and status could be an important issue in the event of death or dispute between my husband and myself. Thus, a formal structuring of the organization was of paramount importance. After discussions with Alan Crook, Ozzie Teichner and Monica Wrobel, we developed a list of objectives, to take into account many facets of our proposed activities, and to serve as a guideline for the future.

I am outlining the five objectives of COTERC and under each I am listing how they are currently being met:

1. "Through education, foster an understanding of and appreciation for the tropical ecosystems, and the vital roles it plays in our natural environments. By so doing, to demonstrate the interdependence of all living things."
 - (a) In Canada, school programs, slide programs and lectures.
 - (b) In Costa Rica, programs set up for ecotourists, as well as for local schoolchildren.

2. "To initiate and to improve communications between individuals and institutions concerned with the development and application of education, research and conservation in the tropics."
 - (a) In Canada, liaisons with various universities, conservation and like-minded organizations, Metro Toronto Zoo, Royal Ontario Museum, Ontario Science Centre, Montreal Biodome.
 - (b) In Costa Rica, affiliations with Museo Nacional de Costa Rica, Universidad de Costa Rica, Simon Bolivar Park Zoo.

3. "To establish and maintain a field station for biological and botanical education and research, to ensure a sound basis for the prosperity of tropical lands through efforts to expand educational and scientific understanding of both natural and agricultural ecosystems."
 - (a) Cano Palma Biological Station, located on the Cano Palma river, near Tortuguero, Costa Rica, has been operating since September, 1991 and has hosted scientists and students from across North America and Costa Rica.

4. "To promote the rainforest as a valuable resource that should not be destroyed, but which can still produce substantial benefits for the surrounding community."
 - (a) Our butterfly farming project is our first initiative in a sustainable development project.
 - (b) Our environmental education program with ecotourists and local schoolchildren emphasizes the need to consider the local inhabitants when promoting conservation.

5. "To raise funds and to invite and receive contributions from individuals of institutions, whatever by way of subscription, publication of books, manuals and other materials. COTERC shall not undertake any permanent trading activities in raising funds for its primary charitable objectives."

- (a) Memberships are actively sought, and fundraising in many forms is carried out, as described elsewhere.

Recognizing a lack of expertise in many areas, we sought a board of directors who could bring a diversity of experience and wisdom to bear upon decisions made. The board met for the first time on October 21, 1991 and continues to meet on a regular basis. Dr. Walter Glooschenko, FES professor, was a founding director. Some of the names have changed over time, but the board continues to represent a cross-section of expertise (Appendix 2). All serve as unpaid volunteers. My husband and I mistakenly appointed ourselves as directors until it was pointed out that we could not legally be directors while having a financial interest in the property in Costa Rica. We developed by-laws (Appendix 3). A search of names currently in use was duly carried on by Scarborough Name and Trademark Search Service and revealed that our choice was available (Appendix 4).

In order to develop the programs we envisioned, we needed to seek funding sources. Charitable status allows us to issue an official tax receipt for donations -- a distinct advantage when attempting to persuade individuals and corporations to donate money. I duly made an application to Revenue Canada for charitable status. We were informed that our application would be approved, but only if my husband and I relinquished rights for the Cano Palma property to the charity. This was a subject for much discussion. How could we justify all the personal money we had already spent, not only in the purchase of the property but the many expenses encountered along the way for equipment, building supplies, legal fees, etc., etc., if we were then to lose control? To this day I have never dared to tally the total outlay of personal funds, which continues to occur when the COTERC bank account gets low. Nevertheless, in the end we decided that it would be in the best interests of COTERC if a mortgage was drawn between the organization and us, and charitable status was eventually granted in January, 1992 (Appendix 5).

The Early Stages

Now that COTERC was a reality, we needed an image to go with it, and thus our logo (Appendix 6) was developed by Ozzie Teichner and David Partington, to be used on stationery (Appendix 6a), business cards (Appendix 6b), brochures and any other COTERC material. I am particularly pleased with the graphics; the hands support the tree, with the birds flying freely above it depicting in my mind the very essence of COTERC's philosophy.

To begin with, COTERC sought to establish an affiliation with various North American universities (Appendix 7), using the set-up of the Organization for Tropical Studies¹ already in existence, as a guideline (Appendix 8). Three professors from Trent University indicated an interest in the affiliation and did spend time at the research facility, but then decided not to proceed. It soon became apparent that most Canadian universities lacked funding for such an affiliation. We changed our approach by contacting individuals in departments who might possibly be interested in conducting field courses, or who might have students interested in carrying on research in a variety of fields. Thus, our strategy lay as follows:

COTERC offers facilities to:

Professor	-- Offers field courses to students at Station
	-- Conducts his own research at Station
	-- Students work on independent studies under Professor's direction

This is the approach that is still primarily used, and letters continue to be mailed out to individual professors and departments.

A great deal of the first year's correspondence involves efforts to publicize the organization. I mailed letters to sixty universities; I submitted a proposal to FES and the Biology Dept., York University (Appendix 9); I contacted The School for Field Studies; Canadians for Conservation of Tropical Nature, and the Nature Conservancy, as well as many conservation organizations such as the Sonoran Arthropod Society, Conservation International and the World Wildlife Fund; and naturalist groups such as the Sierra Club. I prepared notices to submit to professional journals such as the Journal of Herpetology (Appendix 10), and International Primate Society (IPS), announcing the research facilities. A local newspaper published an article (Appendix 11), and little by little we began to receive feedback. Most sent encouraging letters; for example, Dr. Donald Stone, Executive Director of Organization For Tropical Studies, offered his assistance (Appendix 12). It is rather rewarding to receive a telephone call from someone who says they were referred to us by the World Wildlife Fund. Individuals from Royal Ontario Museum, Ontario Science Centre and the Biodome in Montreal contacted us regarding fieldwork. Slowly the network spread until today I receive letters from Europe and all over North America.

¹ OTS is a consortium of American universities established twenty years ago to establish courses and to operate a biological field station in Costa Rica.

The management of Metro Toronto Zoo were kept informed of my activities, but could not involve themselves formally due to a different mandate. Nevertheless, Toby Styles, Executive Director of Support Services agreed to sit on the first board. The Zoological Society of Metro Toronto provided us with a grant of \$16,150 to purchase equipment for the Station.

Slide and video presentations have been an integral part of publicizing COTERC, both to universities and naturalists' groups, in Ontario. (Appendix 13). Gradually, through contacts made at these gatherings, COTERC and I as its representative began to be known by individuals with an interest in conservation and natural sciences. Suddenly I found myself to be the focal point of a video produced by Keg Productions as part of their Profiles of Nature program for public television (Appendix 14). "In Search of the Howler Monkey" has aired internationally since it was released in 1992. Although it brought no financial reward, it is hoped that the publicity generated will spark interest in COTERC's activities.

The Organization

The head office of COTERC was established in the study of our home in Pickering and continues to be located there. My evenings and days off are spent responding to or initiating correspondence, telephone calls or organizing fundraising events.

Currently I act as a liaison to coordinate the overall operations of COTERC, both in Canada and Costa Rica. Long distance telephone calls at designated times maintain communication with the station manager in Costa Rica. Regular meetings are held with the executive and quarterly meetings with the full Board of Directors so that input can be provided by all participants. Frequently I find myself discussing certain issues with particular members of the Board by phone. I see COTERC taking on a life of its own beyond my own identity and being able to function whether or not I remain at the helm. For the time being, however, the majority of work continues to fall on my shoulders, but a participatory democracy is at work.

Proper organizational theory runs along the line of structure and direction, and this is no less true for the non-profit sector. In order to function efficiently in an ever-increasing complex world, it is necessary to define the roles of individuals (Lovelock & Weinberg, 1989). The simple diagram below indicates how COTERC operates presently:

Board of Directors
Executive Committee

Executive Director

Canada

Membership Secretary
Bookkeeper
Other Volunteers

Costa Rica

Station Manager
Assistant

COTERC Members

Membership

Development of a membership in COTERC was seen as a method of involving others who would like to support our goals, as well as being a means of gathering much-needed funds to cover operating expenses. Monica Wrobel designed a membership brochure (Appendix 15) and we solicited all our friends and relations to become members. Notices soliciting membership were placed wherever it was possible to do so for free. I made an appeal at the annual conference of the American Association of Zookeepers in 1991, generating a positive response (Appendix 16), and I wrote an article published in the Animal Keepers Forum (Appendix 16A).

Membership in COTERC provides more than personal satisfaction. A member receives a membership card (Appendix 17), a discount if he or she wishes to visit the research facility in Costa Rica, and is entitled to a vote at the Annual General Meeting and to receive a quarterly newsletter. A T-Shirt with COTERC's logo, is available for sale (Appendix 17A).

The Newsletter

While it was recognized that members would want to know for what their money was being used, and what progress was being made within the organization, where was the mythical person who was going to put it together? The newsletter was to serve as the official means of communicating with members about the events in which COTERC was involved, both in Canada and in Costa Rica, along with articles written on topics of interest. For instance, the station manager provided a column on his personal impressions, as well as featuring a particular plant or animal found at Cano Palma Biological Station. We settled on the name "Raphia" for the newsletter because the raphia palm is a predominant plant found on the Station property. Monica Wrobel designed the masthead; Suzanne MacDonald and I cobbled together the first year's quarterly newsletter (Appendix 18), with help from published sources. We used her MacIntosh located in her office at Atkinson College, York University. The FAX machines were overworked, but we persevered not only because we felt it was import-

ant, but also because it was fun for the two fledgling editors to see what could be done.

In 1992 volunteer Cathy Ward (FES 93) became the regular editor of *Raphia*.

Volunteers

Volunteers are the lifeblood of any non-profit organization. Their enthusiasm knows no bounds when properly motivated; but they do need recognition. A simple "thank you for your help" can make a great deal of difference to an individual who is receiving no pay for hard work done on their own time. COTERC is no exception and has relied heavily on volunteers to get the work done. I have been extremely fortunate in this regard, and try to show my appreciation, sometimes with small gifts, but primarily with words. Lovelock & Weinberg (1989) emphasize the need to rotate volunteers from mundane chores into more interesting work, in order to maintain interest, and the need to treat volunteers as though they are important, and not merely there to do the "scut work".

Volunteers in Canada carry out a very different role from those in Costa Rica. Locally, they fill the following roles:

- Directors and Officers of the Board of COTERC;
- Membership secretary to process new members and send renewal notices to old members;
- Bookkeeper to keep the accounts up to the standards of Revenue Canada;
- Chairman of Education Committee and assistants;
- Director of Research;
- Chairman of Special Programs Committee;
- Editor for the newsletter *Raphia*;
- Assistance with correspondence and special projects, e.g. writing a form letter to selected universities;
- Participation in fundraising activities.

Quite simply, it would be impossible to continue with COTERC without these very valued people.

Fundraising

"Marketing of Goods and Services in Non-Profit Institutions" offered through the Faculty of Business Administration was tailor-made for my purposes. The course provided a basis for understanding how to make a non-profit organization work. The professor, Brenda Gainer, had previously been the fundraiser for Canadian Opera Company and provided many insights into the all-important area of fundraising. As my term assignment, I chose to do an in-depth analysis of Federation of Ontario Naturalists, an organization not too dissimilar from COTERC.

Fundraising is extremely difficult, sometimes discouraging and very time-consuming (Appendix 19). Nevertheless a non-profit organization cannot function without these efforts. From its inception, COTERC has had modest needs in this regard, and mainly due to lack of experience, our fundraising efforts were modest in nature. We weren't too proud to hold garage sales (Appendix 20) and raffles (Appendix 21). Not only was my own house ransacked for articles to sell, but those of most of my friends as well, until we quite simply ran out of items worthy to sell. Super Centre and Loeb provide food and facilities for non-profit groups to hold barbecues, and we have availed ourselves of the opportunity every year (Appendix 22); but their popularity is spreading and it is becoming increasingly difficult to obtain a booking. The Metro Toronto Zoo chapter of American Association of ZooKeepers held a garage sale in 1991 to raise funds for COTERC, and in 1994 they have donated funds for a canoe for the station; its French-Canadian counterpart has twice made contributions. Slide programs have been presented to naturalist groups and others in exchange for a fee, ranging from \$25 to \$50, depending on what the market can bear.

A campaign for corporate solicitation of funds (Appendix 23) has been done on two separate occasions, with dismal results. The first attempt, in 1991 generated no money, but at least letters of encouragement; an interest in support from Mary Kay Cosmetics was indicated, but did not come to fruition after discussions (Appendix 24). The second attempt, in the summer of 1993 generated no responses whatsoever, despite the fact that a great deal of thought was put into the composition of the letter, and it was signed by a prominent local television ombudsman, Peter Silverman, who is currently President of COTERC. One has to assume that the current economic crisis in Canada contributed greatly to this lack of interest.

Membership fees continue to be a source of income to COTERC.

In an effort to generate a steady source of income, we turned to investigating the potential of operating a bingo. An afternoon spent on the telephone calling every bingo hall in and around the Toronto area soon revealed that most halls have no openings; but we were in luck. Bingo Country in Ajax, Ontario was initiating matinees and we could have the Wednesday slot. All I had to do was to get a licence from the Town of Ajax (Appendix 25), by completing the complicated and detailed form provided by the Ministry of Corporate and Consumer Affairs, provide documentation to show that we were a legitimate non-profit group, wait for approval from the Town Council and pay the required fee. We ran our first bingo on Wednesday, November 10, 1993, generating a profit of \$583.86. Since then the profits have outweighed the losses, and we remain optimistic that the

bingos held every second Wednesday will prove to be a more reliable source of income than has our other endeavours. Nevertheless, I acknowledge that one does not put all one's eggs in one basket and I continue to seek other means of raising money.

CHAPTER THREE
CANO PALMA BIOLOGICAL STATION

Facilities

At the time of the purchase of the property in 1990, there was a simple, two-room, thatched open-sided structure in which the previous owner had lived with his family. A campesino's life is not easy; there is very little money to have anything but the bare necessities and enough rice and beans to feed his family. One side of this structure contained a kitchen area, and the other side was a room that served as a bedroom. The centre area between these two rooms served as an eating/sitting area. The floor was merely beaten earth, and the walls were open from shoulder-level to the ceiling, allowing mosquitos and other insects to move around freely. Bats inhabited the roof area, depositing their faeces on the floor below. The family's water supply was provided from a hole dug into the ground, with no provision for protection from contamination. The toilet facilities consisted of a simple privy nearby. Chickens roamed freely around the property area. This living area was surrounded by an area of cultivation, of approximately one hectare, some of which had overgrown into secondary growth. The campesino had attempted to grow bananas, papayas and coconuts to supplement his family's diet, but the majority of the area was not maintained. As there is no provision for garbage disposal in the region of Tortuguero, much of the garbage generated was either buried in a shallow pit, or else left where it was.

In the year 1990-91 the campesino and former owner Marcos Sanchez Sanchez was allowed to remain on the property rent-free, and a small income paid to him in exchange for his services as a warden, to protect the area from poachers and wood-cutters. I am assuming that he saw nothing wrong with cutting and selling timber from the property himself, and we were particularly dismayed to learn that he had cut down a tree that housed a few dozen elaborately woven nests of a bird known as the Montezuma oropendola (Psarocolius montezuma), thus destroying their nesting site. Even three years later, these birds have yet to return to nest at the station. The destruction and sale of property no longer owned by the campesino was a major blow, but by no means the only problem encountered in our attempts to bridge cultural differences. Marcos telephoned us collect in Canada with numerous demands for money that he felt was owing to him; he and his family allowed garbage to be strewn around; Marcos drank heavily and destroyed equipment. Despite our desire to involve a local Costa Rican in our plans, we felt that Marcos was not the suitable candidate, and consequently he was evicted. An older man named Juan Murillo, who owns the property adjacent to the Station, was hired in his stead and proved to be a reliable, honest individual who genuinely cared for, and had great knowledge of the rainforest. Juan remained in our employ for two years;

during which time he did much to forge a relationship between the local villagers and the foreigners who lived at or visited Cano Palma Biological Station,

Despite a lack of funding we decided to proceed with plans to develop the property into a research facility. Naming the station was the subject of intense discussion. It had to be reasonably easy to spell, but it should be meaningful in translation between Spanish and English. The name should have some significance to the region, as well. Eventually Cano Palma Biological Station, hereinafter referred to as the Station, was chosen because it is located on the Cano Palma river. In Spanish, the translation is Estacion Biologica Cano Palma. Signs were commissioned locally to place at the dock area and at the entrance to the Cano Palma river, where the actual property of the station begins.

During the summer of 1991 a four-room dormitory was built to accommodate future researchers, along with construction of two wells, a shower, privies and study area. In Canada it is a simple matter to go to the nearest lumber store and purchase all the supplies needed to construct anything desired. However, in the region of Tortuguero there was no lumber or hardware store, and it was necessary to travel a great distance (by boat) in order to obtain even the simplest thing such as nails. Lumber legally cut, was purchased locally, but had to be taken (again by boat) to a neighbour who owned a small planing mill in order to have it dressed and cut to size. At that time there was no generator to provide electricity for a saw or drill and consequently all work was done by hand with the aid of a chain saw. Bunk beds and simple shelving were manufactured for each of the four rooms of the dormitory. Tin sheets imported from a town fifty miles away, provided roofing material.

The original home of the campesino was converted into a kitchen/dining facility, with a wood-burning stove and simple shelving to store food. Bat droppings were combatted by inserting tin sheeting across the roof pillars. The rest remained virtually unchanged in appearance. In 1993 a used kerosene freezer and a new propane stove were purchased to alleviate the problems of providing uncontaminated food.

Foam mattresses and bedding were purchased and other supplies begged from Canadian friends in order to round out the basic necessities required in setting up any new home, no matter how primitive. In this case, it was a logistical problem to transport all the items from Canada to Costa Rica in luggage.

A proper well was dug, and the water tested for potability. A simple shower system was built by placing a large fibreglass drum on the roof of a tin-sided square "room" and installing a tap inside the shower area. A hand-pump was used above the well

FIGURE TWO

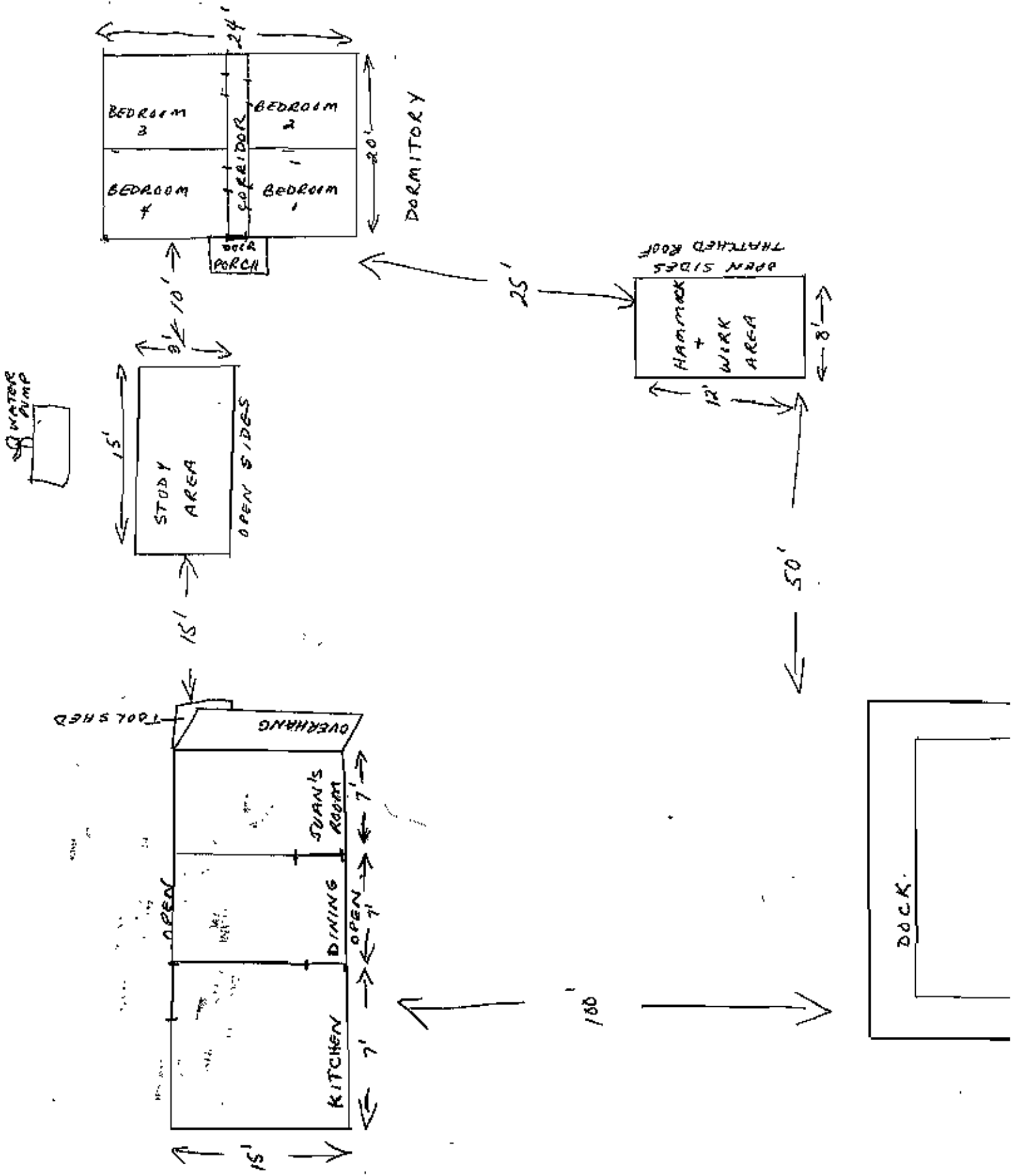
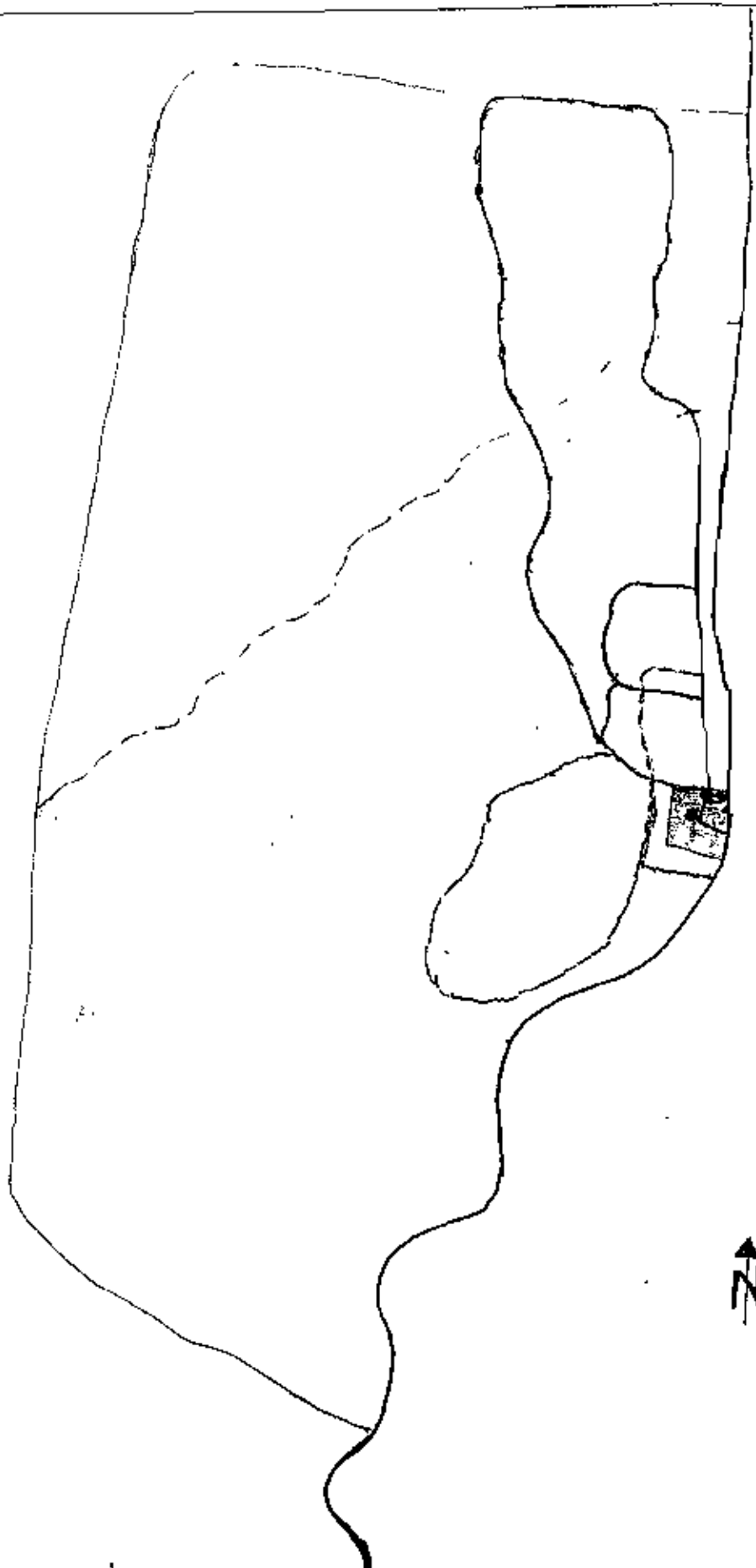


FIGURE THREE



- ~~~~~ River
- ~~~~~ Secondary growth
- ~~~~~ Orilla del Canal
- ~~~~~ Sendero "Colima"
- ~~~~~ Sendero "Rojito"
- ~~~~~ small creek
- ~~~~~ Sendero "Córner el Mesón"

housing to pump water to the drum, where solar energy heated the water. Behind the shower, another tap was installed leading into a heavy porcelain sink for laundry. (Figure Two, Plus Photos).

Because there are no roads, the river is the highway in the region of Tortuguero. A boat and 15 HP motor were purchased in 1991, again with personal funds. A larger and more stable boat and 40 HP motor were purchased in 1992, through a donation received from the Zoological Society of Metro Toronto.

As mentioned earlier, Juan proved to be an excellent assistant, but as a campesino, he lacked the skills needed to deal with foreigners and Costa Rican bureaucrats. A Canadian station manager (Gregory Mayne) was hired in August, 1991, to work along with Juan. This action ensured on-the-spot operation and protection of the facilities, albeit hampered by the problems of communications (or lack thereof) between the staff and personnel in Canada. There is only one public telephone located in the village, and phone lines are often down. Mail is sporadic at best, with theft by postal employees an ongoing problem (Tico Times, December, 1993).

Who Uses Cano Palma Biological Station?

A system of trails was established into the forested area of the Station, utilizing areas previously cleared for removal of some trees by the campesino Marcos. Over a period of time, Gregory ensured that these trails became well delineated, with markers every 50 meters (so that researchers can easily distinguish where they saw a particular animal or plant), and he placed wooden stepping stones in areas of flooding in order to make it easier to get around. (Figure Three).

The trails have served two purposes: first of all, to make the rainforest accessible to researchers and students, and secondly to provide a tool for environmental education.

Research

Since August, 1991 researchers and students from Canada, United States and Costa Rica have come to Cano Palma Biological Station to study and learn (Appendix 26). Topics have ranged from a study on the effects of varying light intensities on the growth of mahogany seedlings to the identification and census survey of poison arrow frogs (Appendix 27.) To date we are the only Canadian research facility in Costa Rica.

In addition to independent research carried on by individuals, groups of students from two different departments of the University of Toronto, as well as from Baylor University, Waco, Texas, and Instituto Tecnológico de Costa Rica (ITCR), have accompanied their professors to gain a firsthand appreciation of

various aspects of the tropical rainforest. Bats have been temporarily trapped with mistnets, identified and released, as have birds. Individual monkeys in a troop have been identified and named for further study. Medicinal plants have been identified and samples collected for chemical analysis at ITCR.

One major distinction between Cano Palma Biological Station and other research facilities such as OTS, is the accessibility to those not necessarily affiliated with a university or institute of higher learning. Zookeepers, in particular, have been encouraged to carry out independent studies in the belief that a trained eye can reveal more than one who has strictly an academic background (e.g. Fischer, 1993).

Another major distinction is the close cooperation developed between Cano Palma Biological Station and Costa Rican educational institutions. Anyone using the Station for a study must provide a copy of the information obtained for retention within Costa Rica. All too frequently foreign researchers take home the information gathered and do not share it with Costa Rican colleagues. The Station has attempted to act on the premise that we are guests of the Costa Rican people, and therefore it is absolutely essential to share with our hosts the knowledge gained.

It is recognized by the organization that the average income is very low within the country of Costa Rica. In order to provide the opportunity for a Costa Rican student to gain field experience, the Station has recently offered an annual scholarship comprising travel expenses from the capital city of San Jose to the Station, plus free room and board for a period up to one month. Although all the details have yet to be worked out, the Dean of Universidad Nacional will decide who this individual will be, from candidates chosen by her staff. We are not aware of any other research facility within the country offering a similar scholarship.

The Station has worked closely with personnel of Museo Nacional de Costa Rica since its inception, and a permanent migratory bird monitoring station was established in 1991. The information obtained through this program is provided to Long Point Bird Observatory, Port Rowan, Ontario, in order to share vital information on the migratory movement of birds who are familiar to all of us in the northern climate, but who overwinter in the tropics. A daily log is maintained to gather data (Appendix 28). It has been known for some time that many species of migratory birds are declining in alarming numbers, primarily due to the destruction of their winter homes in the tropics (Biber, 1991). According to Stiles (1983), there are 220 taxonomic groups of birds who live, either permanently or over the winter, in the Tortuguero area. The tropical forest birds too are threatened by habitat destruction, cage bird trade and hunting (Stiles, 1985). Thus, this is one additional *raison*

d'être for the establishment and ongoing protection of the Station.

During 1991 and 1992 the Station facilities were at the disposal (free of charge) of ornithologist Daniel Hernandez to conduct bird banding courses specifically to teach Costa Rican biologists this important technique. The Station is believed to be the only independent research facility within Costa Rica to fill this learning niche to local students (Appendix 29).

All potential researchers and students, whether North American or Costa Rican, must submit a proposal to COTERC's Director of Research Dr. Suzanne MacDonald, for prior approval (Appendix 30). In this way, we can ensure that non-invasive research only will be carried on, and that animals will not needlessly be killed.

Ecotourism

There is a great deal of discussion, both pro and con, about ecotourists; indeed, even the terminology is debated in detail (Ziffer, 1989), as is the impact on local communities (Brennan, 1993). However, more detailed studies, particularly of the region in which Cano Palma Biological Station is situated (Mowforth, 1993), will probably continue to support the view that ecotourism can be a valuable tool in promoting conservation, as well as supporting the local region, if handled properly (Ziffer, 1989).

The Station makes its facilities available both to overnight tourists (Appendix 31) as well as those visiting casually, in order to provide an opportunity for any interested person to gain firsthand experience in the tropical rainforest. Those who stay longer than a day are invited to participate in any ongoing activities, such as skull cleaning or trail clearing, if they so desire.

The shortest trail, named Colibri, (meaning hummingbird in Spanish) has afforded the opportunity to act upon our mandate of putting environmental education into action right at the property itself. Cano Palma Biological Station has made itself accessible to tourists from the local hotels, who are brought by their guides to the Station. They are given a guided tour of the facilities and taken along the Colibri Trail, in an effort to expand their awareness of the fragility of the rainforest surrounding them. Cano Palma's station manager has spent as long as an hour talking with these tourists, who come from all over the world, educating them about the importance of conservation, and pointing out interesting aspects to them along the trail. No fee is charged, but a donation is welcome. Information about COTERC is available, and an interpretive brochure for a self-guided tour is being prepared (Appendix 32), and will be ready in

English shortly, hopefully with translation into Spanish, German and other languages in the future.

Thus, our presence in this region is hopefully contributing to the appreciation of wildlife protection on a worldwide basis at the grassroots level, by allowing ecotourists to visit and learn. (Appendix 33). This concept is a departure from the traditional role of a research station or a hotel, and one that makes COTERC different from most in its approach.

Local Inhabitants

Just recently a kiosk/museum has been completed. Specimens, such as a snake's vertebrae, a spider monkey skull and a sloth skeleton, found dead in the region have been properly preserved, mounted and labelled by volunteers and are located on shelving alongside a wall mounted with wildlife posters, reports of studies done at the Station by researchers, and conservation information. The intent is to utilize these tools to disseminate information not only to the tourists who visit, but also to initiate visits by local schoolchildren, to educate them about their natural heritage. The majority of the children in this region of Costa Rica have been surrounded by the forest and its inhabitants all their lives but view them as a resource to be exploited. They have not been provided with a framework to understand the far-reaching effects of such actions, either within the school system or at home. It is not our intention to condemn a traditional way of life, but rather to point the way to alternatives.

The course ENV5 6150 Critical Education for Social Change provided insight into questioning assumptions, attitudes and actions that we all bring with us when attempting to educate others. As a result of this course, I believe I am better equipped to adopt an environmental education program at Cano Palma Biological Station that will reflect my philosophy of conservation, but at the same time respect the cultural philosophy of the individual. The Station will act as a learning centre utilizing the materials in the museum, nature walks and hands-on learning material obtained from various environmental education sources, such as colouring books featuring endangered animals. At the moment this material is available primarily in English, but it is hoped that this problem can be rectified.

In order to assist the local economy, the Station has purchased the majority of its supplies locally, when possible. Reference will be made in Chapter Four to other local initiatives and assistance.

There is a growing awareness and probably resentment amongst the local inhabitants that their land is being gobbled up by foreigners, as is the case in many Central and South American

countries. In most instances, the local population does not benefit in any way whatsoever from these purchases, other than the money obtained by the individual landowner. As an example, Marcos, the former owner of the property now known as Cano Palma Biological Station, took the cash paid to him and spent it all. He and his family now live with his parents-in-law. I really do not have the answer for this; I doubt if anyone does. But I do hope to retain sufficient humility to be aware of a responsibility to the community as an outsider, and to work towards fulfilling a commitment to work with them to continue my goal of wildlife protection.

Volunteers

As word of the existence of the Station has spread worldwide, so too have enquiries about volunteer work from people of varying ages and backgrounds. In fact, it would be safe to state that COTERC receives as many enquiries about volunteer work as it does about research opportunities. As a result of trial and error, certain criteria have been developed:

- (a) The volunteer must be a member of COTERC;
- (b) The volunteer must be at least twenty-one years old;
- (c) The volunteer must be available for a minimum of at least two weeks;
- (d) The volunteer must pay for his or her food while at the Station;
- (e) The volunteer must be willing to tackle any task assigned by the station manager, no matter how trivial (e.g. washing dishes).

These criteria have been utilized to cull those looking for a free vacation, based on some unhappy early experiences.

The majority of volunteers have proven to be extremely helpful and are an invaluable source of assistance to a cash-strapped organization such as the Station and COTERC. They have contributed in many ways to the achievement of various programs and activities, both in Canada and Costa Rica. The emphasis on this particular chapter delineates their work at the Station specifically. A list of some examples includes gluing skeletons together, helping to construct a septic system for the toilet, the preparation of educational material for local use, participating in the migratory bird monitoring program, and installing electrical wiring throughout the Station property for hook-up currently to a generator, and in future, to electricity.

The volunteers themselves represent a diversity of backgrounds and countries of origin. Although intended to be a Canadian organization primarily, the Station has welcomed volunteers from Germany, England, Finland, South Africa and U.S.A. as well as Canada. A factory worker has found respite by digging

holes to lay electric cable. A veterinarian has examined the Station's watchdog as well as making and painting signs to attach to trees for the new interpretive brochure developed by her hydrogeologist husband. A geologist learned how to identify birds and record them for the migratory bird survey.

The use to which the Station has been put has been multiple. However, the underlying intent of all these various uses has been the same. In order to protect and preserve this fragile ecosystem, it is essential to understand its integral parts and how each depends upon another, and then to educate others to care, through hands-on experiences. By adhering to this viewpoint, the Station fills a unique niche not emphasized by others.

CHAPTER FOUR PROGRAMS

Since the inception of Canadian Organization for Tropical Education and Rainforest Conservation, its mission has been to provide leadership in education, research and conservation and the wise use of natural resources in the tropics. In order to carry out this mission, programs have been developed both in Canada and Costa Rica to reflect this philosophy.

CANADA

Education

It might be argued that, as a Canadian organization, we should be promoting the conservation of our own lands. Admittedly this is a vital area to be covered, but it is necessary to remain focused in order to be effective. Thus, we have chosen to concentrate efforts of environmental education on the tropical rainforest, with emphasis on that found in Costa Rica. No one will currently dispute the need for environmental education locally. Only when we are aware of the problems can we hope to do something about them. The media have done much to bring problems to our attention.

Schoolchildren are far more aware of environmental crises than my peer group, thanks primarily to the programs carried on in the classroom. COTERC is a participant in this learning process through the Education Committee. Julia Murphy and Roslyn Moore have developed slide programs aimed at various grade levels, and carry the message currently to schools in the Toronto and surrounding areas. Funds for the duplication of slides, etc. for the program are generated through fees charged for the program. Learning kits presently available from other sources will be utilized as well, when funds are sufficient. There is no need for COTERC to develop its own kits and thereby duplicate the worthy efforts of others.

On a different level, a slide and video program has been developed for use with adults in universities and clubs, such as Pickering Naturalists. The issues discussed are slightly more concrete than those presented to schoolchildren, e.g. disappearance of migratory birds. But the message is the same: we must try to stop environmental degradation.

Save An Acre Project

The purchase of the tract of tropical rainforest in 1990 was a small beginning. Since then many more campesinos have moved into the area around Tortuguero, attempting to make a living from the very poor soil by clearing an area of rainforest to construct a simple building and to plant bananas, papaya and other crops.

The land is ostensibly part of the Barra Del Colorado Wildlife Refuge and therefore protected. The reality is very, very different. Since 1990 I have journeyed to the region on six occasions. Each time I see more and more degradation of the rainforest. Three more lodges have opened their doors since then; Johnny has cleared most of the trees on his land across the river from the station dock. This used to be the corridor for the movement of howler and capuchin monkeys. Johnny would like to sell his property, which abuts the beach on the east side -- an ideal place for a new lodge, I fear.

In response to this dilemma, COTERC has developed a project entitled "Save An Acre" (Appendix 34). Its object is similar to those of the Nature Conservancy or World Wildlife Fund -- to buy land before it is destroyed forever. The distinct difference is that our project is very local. All funds raised go directly towards the purchase of land and not administrative costs, and it is for designated properties, as opposed to World Wildlife Fund's giant pot. The land will be purchased in the name of COTERC and administered by us, to ensure that squatters and poachers cannot degrade it any more than has been done so.

COSTA RICA

Migratory Birds

North American songbirds are disappearing at an alarming rate, the major reasons being the destruction of their winter homes, the widespread use of pesticides and rodenticides, loss of food resources, hunting and human persecution (Biber, 1991). To determine just how significant the figures are, it is necessary to monitor the birds in both their summer and winter homes. Cano Palma Biological Station has been the centre for migratory bird monitoring since 1991 and shares the information generated with Long Point Bird Observatory, Port Rowan, Ontario. Personnel from Museo Nacional de Costa Rica originally set up the program, and continue to share in its findings. Participants use a standard marking sheet to record their sighting at various locations and at various times of the day (Appendix 28). The vital records generated will assist scientists in determining the gravity of the international situation with regard to the growing numbers of disappearance, and the implications for the future.

Under the supervision of scientists from Museo Nacional de Costa Rica, migratory birds have been mistnetted and banded for identification.

Cano Palma Biological Station also participated in the International Christmas Bird Count for the first time in 1993, to contribute to the world data bank for birds.

Research

Protection of the wildlife and flora on the property known as Cano Palma Biological Station is a foremost consideration. However, the property itself is a very small part of a much larger area of tropical rainforest. The raphia palm (Raphia taedigera) is specific to this region. Within this area many of the animals utilize large areas in their daily quest for food, such as the spider monkeys; some are migrants who visit only during the fruiting season for certain trees, such as the great green macaw; Others remain within the boundaries of the Station itself, such as the poison arrow frog (Dendrobates pumilio). "Biological diversity" encompasses all species of plants, animals, and microorganisms and the ecosystems and ecological processes of which they are parts." (McNeely et al, 1990). It is essential to study and thus increase our knowledge of the biodiversity of a region, in order to be able to protect it (Bresard, 1982). Baseline biotic and floristic surveys (Appendix 35) begin the process. Thus, research has become a primary focus at the Station. By opening the Station to scientists and students, it is hoped that this goal will be accomplished. A secondary benefit is the spread of knowledge and appreciation of the flora and fauna in the scientific community through publication of findings.

Education

The efforts with regard to education in Costa Rica have been previously outlined in Chapter Three.

Community Development and Cooperation

The course "Introduction to Resource Management" led me into new areas of discovery and brought to my attention how overworked this, and equivalent terminology is; equally so, the terms are used in a variety of ways ranging from total destruction of the "resource" to the new buzzwords "sustainable harvest" (Livingston, 1988), and "carrying capacity". The latter term has led to extensive studies in an effort to determine biophysical and social ramifications of the use of a resource, such as the cumulative effects of trampling on trails (Mitchell, 1989). There is an inherent contradiction in philosophy between biological conservation and resource management. But, Mitchell's model of integrated resource management makes a lot of sense in that he advocates having all the parts combined into a harmonious whole, as opposed to looking at only one particular aspect of a resource problem. Applying this principle to COTERC's objectives, we must necessarily consider the local community in which we have chosen to work.

It has been recognized by the principals of COTERC that the organization cannot function in a foreign country without involving the local inhabitants in a way that is meaningful. Tortuguero is an area of extreme poverty. The chances of making an income are very slim, unless one is able to find work, for example, as a tour guide or on nearby banana plantations. The region is home to a mixture of ethnic backgrounds: Nicaraguan refugees, descendants of Jamaican immigrants and Ticos (native Costa Ricans). Many of the Ticos were born in other parts of Costa Rica but have migrated to Tortuguero in the hopes of a better life. There is an uneasy peace between these groups, many of whom live in close proximity to one another in the village of Tortuguero. From my personal experience, cooperation amongst them is difficult, but not impossible when they see a benefit. For instance, the local council recently established a site for recycling garbage; heretofore there was no means of garbage disposal and everyone burned or buried what they could. The recycling program has provided a more efficient means to dispose of garbage, and individuals are taking advantage of the program.

Although our Station manager is a bilingual gringo, the assistant hired has always been a local Tico. Juan held this position for the longest period of time to date, and contributed greatly to our overall knowledge of the flora and fauna of the region through his eagerness to share his lifetime of experience in the rainforest. Eventually Juan was lured away to a better-paying position. We strive to be sensitive to the cultural differences in attitude regarding responsibility inherent in the job of assistant, but at times we have run into difficulties. For instance, Aron (Juan's replacement) took the Station's boat to the village and returned without the top of the motor (it will cost \$450 to replace this part). No reasonable explanation was offered, but it appears that someone had a grudge against Aron. Aron was not terribly concerned about this theft, and we have come to realize that the villagers see us as wealthy foreigners, who can easily afford to lose such items. One can readily agree with this appraisal if one stops to think about it. We North Americans arrive via plane, loaded with still cameras, video cameras, new clothing, binoculars and other paraphernalia; in contrast to most villagers, we are indeed wealthy. There have recently been thefts of money from the dormitory and small items of equipment. Aron quit, and Julio replaced him. Julio likes to leave unannounced and take days off when he feels like it. He is being offered the opportunity to learn English, a skill that could provide him a future job as a guide. It is hoped that despite these setbacks, the goodwill of hiring and paying a salary to a local will assist our overall efforts. I must admit to being tempted to hire a second gringo as an assistant, one who has skills that a Tico does not, but resist the idea.

Notwithstanding the thefts we have encountered, we are gradually being accepted by the community. Greg, our station manager has been invited to participate in town meetings. We were both invited to attend a three-day seminar put on by government facilitators to map out the future of the area. It was impressive to witness the facilitator drawing out the opinions of various townspeople on what they felt were their needs for the future of their village, and in what direction they wished to go. At the end of the three days, there were several concrete ideas dealing with perceived problems along with solutions to those problems. I felt honoured that our organization is recognized as a participant in the future planning of the area.

COTERC and the Station wanted to assist the local community to improve their living conditions, but not in a manner that would appear to be infringing upon their autonomy. One avenue we are attempting is to allocate 10% of gross proceeds received from donations from visitors to the Station towards the purchase of playground equipment for children in the village of Tortuguero. This project is being done in conjunction with an American who owns a souvenir shop in the village. Antoinette has been married to a local Tico for eight years, and shares our concern about the lack of facilities for children, including her own. Although it may not be completely appropriate to conduct this project with another gringa, the idea for the playground comes from the villagers themselves. We are acting as agents merely to provide the funding for the equipment.

Robinson & Redford (1991) argue that, in order to conserve wildlife, one must demonstrate an advantage to the local inhabitants -- one that will provide them with an economic benefit. This is still a controversial topic, and is contrary to some traditional ideas of biological conservation (Livingston, 1988). Notwithstanding my arguments in Chapter One dealing with our attitude towards wildlife, I submit that because of our nature as a species, much of the wildlife will most certainly disappear unless we do find a "use" for it. In recognizing the need of involving the local community, COTERC has developed a plan to establish a butterfly farming project as a sustainable development project (Appendix 36). In short, we will set up the facilities to raise butterfly pupae for export to foreign markets in Europe and North America. Whereas the original butterflies are harvested from the wild population, this original stock is confined within a netted area and provided with the appropriate plants on which to lay their eggs. The eggs develop into larvae, and thence into pupae. The pupae are then collected, mostly for export with some being returned to the wild to replenish the population. Thus, the term "sustainable development" is an accurate reflection. Butterfly exhibit houses are a very popular attraction to the public in these regions, but because of the short lifespan once the pupae has metamorphosed into a butterfly, a steady supply of pupae is needed. Indeed, Metro Toronto Zoo

imports pupae from John Osborne in Costa Rica. The Canadian funding agency CIDA has provided us with funds to initiate the project; John Osborne is providing expertise and assistance in obtaining permits, etc. from the Costa Rican government, and we have a commitment from a European supplier to purchase all the pupae we can produce. An approved biologist has inspected the Station and shortly we will hear from the Costa Rican government as to whether we will receive approval to proceed. There is every possibility that this will happen. As soon as possible, a second Costa Rican assistant will be hired to assist in setting up the facilities needed to initiate this project. The overall intent is not to make money for COTERC but to serve as a model to teach interested local people how they can participate. We will show them how to set up their own small-scale project on their own land and act as agents to sell their product. We will involve the local council members as we initiate the program, to obtain their input as to the best method to proceed. No one will be forced to participate, but we hope that by demonstrating our concern for their future, the local inhabitants will come to see us as a positive influence in their community. Thus, a new local industry will provide an income to the participants so that they will not be forced to turn to destructive alternatives such as logging the rainforest.

A separate project that is near to my heart is the development of a women's craft cooperative. Currently the women of Fortuguero are restricted to menial jobs at the nearby lodges if they wish to work outside the home. Some are single mothers; others struggle with daily life within a less than ideal home situation. It is not possible to cure all social ills, and I would not presume to suggest that we can do so. However, the development of a women's craft cooperative would provide an alternative source of income, and perhaps a ray of hope for the future. At the moment, this is only a wish of mine; it is time to consolidate the projects that are already initiated before proceeding with new ones.

CHAPTER FIVE LOOKING AHEAD

The Future

COTERC is well on its way now, as evidenced by its continuing existence despite the severe economic times. Cano Palma Biological Station is becoming increasingly well known. However, the new laws recently passed by the Costa Rican government will make it less attractive to foreign scientists because of the procedure of applying for a permit to conduct research or courses for students. We have attempted to make it as easy as possible, but it still requires an application to be made, in Spanish, first to the local Costa Rican embassy in the country of origin, and then to MIRENEM, the Costa Rican Wildlife Department, with the appropriate fees. Only when one has received official approval will it now be possible to carry on studies. Only time will tell what eventual impact this will have on our operations.

Our relationships with Museo Nacional de Costa Rica as well as Universidad de Costa Rica are in the process of being formalized into written agreements. We will build on these affiliations and hope to expand them to other Costa Rican institutions in the future.

The membership base of COTERC still remains relatively small. It is important to expand the numbers in future, both to generate funds and as a means of communicating our conservation goals to others. The purchase of membership lists from other sources, such as Equinox is one method of accomplishing this.

Once the butterfly farming project is a reality, we can look at undertaking other initiatives in this area.

The Save An Acre campaign is slow; once we have accumulated sufficient funds, we will proceed to purchase other properties in order to protect them from further destruction.

Fundraising continues to be a major objective. It is hoped that future efforts will generate sufficient income that I can devote myself one hundred percent to the administration of COTERC, instead of only in my spare time.

As for me personally, I have long recognized the necessity for my being able to converse with Costa Rican officials and locals in Tortuguero, whose native tongue is Spanish. I continue to work on my fluency in Spanish in night classes in Canada, and hope to take one of the immersion courses offered in Costa Rica where one lives with a family while attending school.

It has become increasingly obvious to me that I require a better grounding in accounting, in order to be able to keep proper books and to fill out the various forms required by governments. I have been studying manuals on my own, and have sought the assistance of accounting expert Manon Jenkins, our bookkeeper, and expect to become better acquainted with proper accounting procedures as a result.

My Independent Study courses "Applying Behavioural Research to Zoo Animal Management", "Reference Search Project", "Preparing Paper for Publication", "Gorilla Tool Use", as well as the Independent Fieldwork involving trips to Costa Rica have all contributed to skills required to be successful with the organization and operation of COTERC. My daily work with COTERC constantly brings me new challenges to be met. These ongoing experiences serve me in good stead for development and growth.

POSTSCRIPT

It is January, 1994. As I sit here writing on a laptop computer surrounded by the peace and serenity snowbound at Cathy and Jim Ward's cottage near Bancroft, Ontario, while listening to the Phantom of the Opera on my cassette tape recorder, I have ample opportunity to reflect on the events that have occurred since I first entered the Faculty of Environmental Studies program in 1990. From a desire to study the impact of human encroachment on gorillas in Gabon, West Africa, my focus has radically changed. And yet, the core has not. My studies through and around York University have led me into very different avenues of investigation, and yet they all tie together in the end to provide me with the framework needed to continue the work of wildlife protection, but within a very distinct and defined area- that of the lowland tropical rainforest of Costa Rica. Nevertheless, the work is necessarily not restricted in scope. In order to accomplish the little, it is essential to look at the big picture, and to take into account the impact we humans have and will continue to have on our planet as a whole.

There have been many moments in the past three years when I have felt utter despair, wondering what I have got myself into. How can this project possibly work? There have been many painful personal events, but just when I think that everything is hopeless, another membership will arrive in the mail; a cheque will arrive; a phone call will inform me of someone's wonderful experience at Cano Palma, and how it has affected his or her attitude. These interludes give me the strength to continue.

When I contemplate the work ahead, I tend to cringe at my audacity to think that I could make a difference. And yet, one can dare to dream. One must dare.

ACKNOWLEDGEMENTS

Many influences are responsible for the paths taken, and have guided me during my search; it would be impossible to list them all, but I do want to single out the following:

Lynn James, for her unflagging loyalty, and who has always been there for me;
Suzanne MacDonald, for her continuing support and encouragement;
Sandra Brown, for rescuing me;
John Livingston, for his guidance and inspiration to try;
Leesa Fawcett, for her moral and practical support;
Frances Burton, for inspiring me to search in the first place;
Birute Galdikas Brindamour, for providing me with the opportunity to meet a wild orangutan and thus begin this adventure.
Cathy Ward, for egging me on and providing the environment to finish.

And lastly, to Mingo, Puppe, Charles, Josephine, Samantha, Amanda, Julia, Caroline, Catherine, Patrick, Jabari, Tabitha, Sekani, Jomo and to the memory of Natasha and Minkebe, who taught me how insignificant humans truly are in the grand scheme.

BIBLIOGRAPHY

- Anonymous. 1990. Turtle Research at Tortuguero, Costa Rica. Volunteer's Manual. Caribbean Conservation Corporation: Gainesville.
- Arias, Sanchez, Oscar. 1989(a). The Arias Peace Plan. in Costa Rica Reader. Marc Edelman & Joanne Kenen, eds. Grove Weidenfeld: New York. pp 362-367.
- Arias, Sanchez, Oscar. 1989(b). Let's Give Peace a Chance. in Costa Rica Reader. Marc Edelman & Joanne Kenen, eds. Grove Weidenfeld: New York. pp. 368-374.
- Biber, Jean-Pierre and Tobias Salathe. 1991. Threats to Migratory Birds, in Conserving Migratory Birds. ed. T. Salathe. ICBP Technical Publication #12. International Council for Bird Preservation: pp 17-35. Cambridge, England.
- Blake, Beatrice and Anne Becher. 1993. The New Key to Costa Rica. Ulysses Press: Berkeley, CA.
- Brennan, Peter. 1993. Ticos Grapple with Dilemmas as Ecotourism, Mass Tourism Clash. in Exploring Costa Rica. The Tico Times S.A.: San Jose, Costa Rica.
- Bresard, P.F.. 1982. The Role of Field Stations in the Preservation of Biological Diversity. BioScience. 32(5):327-330.
- Carr, A. 1983. Chelonia mydas in Costa Rican Natural History. Daniel H. Janzen, ed. University of Chicago Press: Chicago. pp. 390-392.
- Collins, Mark, ed. 1990. The Last Rain Forests. Oxford University Press: New York.
- Dudenhoefer, David. 1993. Conservationists Working to Manage Visitors, Capture More Funds for World-Famous System. in Exploring Costa Rica. The Tico Times S.A.: San Jose.
- Edelman, Marc and Joanne Kenen, eds. 1989. Costa Rica Reader. Grove Weidenfeld: New York. p ix.
- Fischer, Denise Lucy. 1993. The New World Primates of Cano Palma, Costa Rica. Unpublished.
- Fournier, Luis A. 1991. Desarrollo y Perspectiva del Movimiento Conservacionista Costarricense. Universidad de Costa Rica: San Jose.

- Hartshorn, G. 1983. Chapter 7. Plants. Introduction, in Costa Rican Natural History. Daniel H. Janzen, ed., University of Chicago Press: Chicago. pp. 118-157.
- Jenkins, Jackie. 1990. Wildlife Rehabilitation: A Caring Relationship with the Wild. A Paper on a Major Project submitted to the Faculty of Environmental Studies in partial fulfilment of the requirements for the degree of Master in Environmental Studies. York University: Toronto.
- Livingston, John A. 1988. The Fallacy of Wildlife Conservation. McClelland and Stewart, Toronto.
- Lovelock, Christopher H. and Charles B. Weinberg. 1989. Public & Nonprofit Marketing. Second Edition. The Scientific press: Redwood City, CA.
- McNeely, Jeffrey A., Kenton R. Miller, Walter V. Reid, Russell A. Mittermeier and Timothy B. Werner. 1990. Conserving the World's Biological Diversity. IUCN, Gland, Switzerland; WRI, CI, WWF-US and the World Bank, Washington, D.C.
- Mitchell, Bruce. 1989. Geography and Resource Analysis. Second Edition. Longman Scientific & Technical: England & John Wiley & Sons Inc.: New York.
- Mowforth, M. 1993. Eco-tourism in Central America: practice and potential. Research Report Series No. 4.1993. Dept. of Geographical Sciences, University of Plymouth.
- Pister, E.P. 1979. Endangered Species: Costs and Benefits. Environmental Ethics. 1:341-352.
- Robinson, John G. and Kent H. Redford. 1991. The use and Conservation of Wildlife, in Neotropical Wildlife Use and Conservation. John G. Robinson & Kent H. Redford, eds. The University of Chicago Press: Chicago.
- Stiles, F.G. 1983. Chapter 10. Birds. Introduction, in Costa Rican Natural History, Daniel H. Janzen, Ed. U. of Chicago Press: Chicago and London. pp 502-530.
- Stiles, F.G. 1985. Conservation of Forest Birds in Costa Rica: Problems and Perspectives, in Conservation of Tropical Forest Birds. eds. A.W. Diamond & T.E. Lovejoy. Proceedings of a Workshop and Symposium held at the XVIII World Conference of the International Council for Bird Preservation. ICBP Technical Publication #4: pp 141-168. Cambridge, England.
- The Tico Times S.A., 1993. San Jose, Costa Rica.

Ziffer, Karen A. 1989. Ecotourism: The Uneasy Alliance. First in Conservation International's Series of Working Papers on Ecotourism. Conservation International: Washington.