Promoting Ecological Education at Lankester Botanical Garden

July 5, 2000

Jorge Warner
Executive Director
Lankester Botanical Garden

Dear Señor Warner:

Enclosed is our report entitled "Promoting Ecological Education at Lankester Botanical Garden". It was written at Lankester Botanical Garden during the period of May 13 through July 5, 2000. Preliminary work was completed in Worcester, Massachusetts, prior to our arrival in Costa Rica. Copies of this report are simultaneously being submitted to Professor Arthur Gerstenfeld and Professor Susan Vernon-Gerstenfeld for evaluation. Upon faculty review, the original copy of this report will be catalogued in the Gordon Library at Worcester Polytechnic Institute. We greatly appreciate the time that you and the employees of Lankester have devoted to us.

Sincerely,

Amanda Beaudoin

Benjamin Kurtz

David Cooney

PROMOTING ECOLOGICAL EDUCATION AT LANKESTER BOTANICAL GARDEN

An Interactive Qualifying Project
Submitted to the Faculty of

WORCESTER POLYTECHNIC INSTITUTE

By

Amanda Beaudoin

Benjamin Kurtz

David Cooney

In Cooperation With

Jorge Warner, Executive Director
Lankester Botanical Garden

July 5th, 2000

This project is submitted in partial fulfillment of the degree requirements of Worcester Polytechnic Institute. The views and opinions expressed herein are those of the authors and do not necessarily reflect the positions or opinions of Lankester Botanical Garden or Worcester Polytechnic Institute.

This report is the product of an education program, and is intended to serve as a partial documentation for the evaluation of academic achievement. The reader should not construe the report as a working document.

Abstract

Lankester Botanical Garden has one of the foremost collections of orchids in the world and is home to 165 species of birds. This organization provides educational opportunities for researchers, students and tourists. At the time of our project, Lankester was in a financial crisis. To increase revenue and enhance ecological education opportunities, our group developed a bird watching program as a model for future programs. We also developed a new marketing strategy for the garden, including the creation of a new web site. The implementation of the pilot program and the web will improve the ecological information output of the garden and will create increased revenue for future programs.

Individual Project Responsibilities

This project is the culmination of the efforts of our three group members. Each member had an equal hand in the writing and revising of the final report and in the collection of data. Individual responsibilities were assigned to each of the three members as follows. Amanda Beaudoin gathered information about the specifics of bird watching programs and contributed to the cost analysis. Ben Kurtz was responsible for analyzing tourist statistics, creating a marketing strategy and implementing the web site. David Cooney was responsible for the collection of transportation data, information regarding outsourcing, and he contributed to the cost analysis.

Acknowledgements

We would like to thank the following people for their help and support throughout the development of this project.

Jorge Warner, Executive Director, Lankester Botanical Garden

Jaime Aguilar, Director of Field Courses, Lankester Botanical Garden

Julio Sanchez, President of the Organization of Ornithologists

Ernesto Carman, Bird Watching Guide

Terry Pratt, Marketing Director, Horizontes Nature Travel

Arthur Gerstenfeld, Project Advisor

Susan Vernon-Gerstenfeld, Project Advisor

Table of Contents

List of Figures

List of Tables

Executive Summary

We completed our project entitled "Promoting Ecological Education at Lankester Botanical Garden" for Lankester Botanical Garden, a non-profit organization funded by the University of Costa Rica. Lankester is home to over 800 species of orchids, making it one of the foremost orchid collections in the world. The garden strives to practice and teach the conservation and cultivation of orchids.

At the time of our project, Lankester Botanical Garden was in financial crisis. To improve the financial and educational status of the garden, Jorge Warner, the garden's Executive Director, created a master plan. The plan included the creation of a bird watching program, some components of which, namely, transportation and scheduling for example, may serve as a model for future programs at the garden. These programs could include general garden tours and orchid tours.

The objective of our project was to enable Lankester Botanical Garden to better provide educational opportunities and information for its patrons, while at the same time provide needed income for the garden's other programs. Conservation of the environment is a large part of Costa Rica's culture. Through our project, we have given Lankester Botanical Garden a way to teach people about and provide them with information on environmental conservation. We have accomplished this by addressing four topics.

The major focus of our project was on the development of a bird watching program. This bird watching program will make people aware of Costa Rica's large diversity of birds and will promote conservation. Julio Sanchez, a well-known Costa Rican ornithologist, has suggested that the bird watching program be an introduction to

the birds of the Central Valley, as well as to Costa Rican natural history. Thus the program provides participants with a list of bird species at the garden and information on the life zones of Costa Rica.

We are recommending that the program be outsourced to Costa Rica Temptations. This includes all transportation and the hiring of guides. Our rational is as follows: We examined options for transportation and guides. The three transportation options we studied were vehicle purchase, vehicle renting, and vehicle outsourcing. Our group conducted cost estimation for each of these options. After completing these estimations, we found that the outsourcing option is the most feasible. We also conducted interviews to determine the necessary training, certification, payment and sources of bird watching guides. We found that the Instituto Nacional de Aprendizaje (INA), in San Jose, provides free courses for Costa Rican tour guides. Our group also discovered that there is a list of free-lance certified guides compiled by the Instituto Costarricense de Tourismo (ICT). Through outsourcing, Costa Rica Temptations is also a source of bird watching guides. Hence, the garden should outsource the hiring of guides to Costa Rica Temptations.

We also recommend that the bird watching tour be a half-day event. The participants will be taken to Cartago for breakfast after bird watching. They will also be given a tour of La Basilica, the famous cathedral in Cartago. The schedule for the program is as follows: The customers will be picked up at 5:30 a.m. at their hotels and taken to the garden for bird watching. At approximately 9:30 a.m., the customers will be taken to Cartago for breakfast and the tour of the cathedral. The customers will be returned to their hotels at approximately noontime.

The second part of our project involved the creation of a marketing strategy for the garden and the bird watching program. With the use of the 1998 ICT tourism statistics and surveys from a previous WPI project group, we developed a marketing strategy to promote the garden and the bird watching program. The information in the ICT report was useful as it gave a breakdown of tourist activities in Costa Rica. For example, of all tourists visiting during the high season, 41.2 percent had gone bird watching during their stay in Costa Rica, and 57.4 percent had participated in activities involving the observation of flora and fauna. The marketing strategy we developed includes pamphlet distribution sites, press releases, the notification of guidebooks and public service announcements on radio stations. The majority of these marketing steps are free or cost very little.

A third component, related to the marketing strategy, was a web site for the garden, which we created with the help of a University of Costa Rica graphic design student. The web site is an effective way for Lankester to provide ecological information for its patrons. See Appendix J.

The last focus our project addressed was the formation of alliances between Lankester and other local and international organizations. These partnerships are intended to develop new options for research and funding. Our group contacted the WPI Biology Department, National Audubon Society, and the Rainforest Aerial Tram Foundation in order to propose alliances. We feel that a partnership with the WPI Biology Department would promote joint research, study opportunities and funding sources. At the time of the printing of this report, a preliminary meeting between Jorge Warner and Pamela Weathers, Professor of Biology at WPI was scheduled. We have

recommended that the garden continue to pursue an alliance with the National Audubon Society, as such a partnership would promote program and funding opportunities. A meeting was held between Lankester Botanical Garden and the Rainforest Aerial Tram Foundation. At that meeting, community projects and joint funding were discussed. Both parties are excited about the possibility of this alliance.

Our group feels that with this proposed program and these recommended marketing strategies and alliances, Lankester Botanical Garden will be able to better provide educational opportunities and information for its patrons. The bird watching program will teach the participants about the birds of the Central Valley as well as about the natural history of Costa Rica. The web site will be a device with which to expose people to conservation information. The garden will also receive increased revenue from the program and be able to partake in additional funding sources through the alliances.

1. Introduction

Lankester Botanical Garden is a nonprofit organization in Costa Rica funded by the University of Costa Rica as well as by fees paid by its visitors. Lankester has what is regarded by many as the foremost orchid collection in the world. It is a valuable collection in terms of ecological importance as orchids are hard to cultivate and species can easily become extinct. In addition to their orchid collection, the garden also offers field courses in the natural history of Costa Rica and its wildlife.

Lankester Botanical Garden wants to become a center for ecological education. Also, currently, Lankester Garden has a problem involving funding. The University of Costa Rica provides funding for the garden's personnel, but increasing salaries due to seniority have reduced the amount of funding to be used for research, security, and improvements to the garden.

The main goal of this project is the improvement of ecological education at Lankester Botanical Garden and in turn, an improved financial picture. We have achieved this by the implementation of a bird watching program, the formation of alliances and the creation of a web page. This project has resulted in a bird watching program that our team intends will be a model for future ecological programs at Lankester. We have developed a schedule and details for the program that can be implemented for future programs at the garden. The garden also wishes to use the arrangements we have made for this bird watching program for regular visitors to the garden. This program, as well as the future programs it inspires, will help to alleviate the problem of funding and allow Lankester to continue in its orchid research. Each new improvement will be used to justify an increase in ticket prices. Each increase in ticket

prices will make new improvements possible. By bringing in more income, more programs can be provided and less funding from the University of Costa Rica will be necessary. This bird watching program will be one step, though an important step, to help Lankester become a financial success as well as an ecological gem. The end result will be a program that is accessible to and educational for both tourists and locals. Both residents of Costa Rica and foreign tourists will be able to use this program. We aim to make it an asset to the public, to schools in Costa Rica and to travelers around the world. Our group has created a marketing strategy to make this program well known.

The garden contains a wide variety of plants, both indigenous and non-native, and attracts a large number of birds. The species attracted include both resident and migratory birds. This junction of plants and birds presents an ideal situation for bird watching. Lankester Gardens proposed this project to create a bird watching program within the garden.

In order for a program to be implemented, we have considered many issues. Our team has researched and evaluated the guides, fees, and transportation of other bird watching programs. We have also interviewed Julio Sanchez, one of the top Costa Rican ornithologists and used his guidance in developing our program. Once we established program and implementation ideas, we began to focus on marketing the program and estimating the overall cost.

In order to develop a program plan and marketing strategy, we have taken an inventory of Lankester's current personnel and their birding skills. Our group has used this information to determine how many guides should be hired and at what level of expertise. Using the information gathered from other bird watching programs, we have

determined subjects such as pricing, content, and personnel. Our group has also visited tourist agencies in order to observe what method is taken for the hiring and education of guides. After these visits, we determined whether or not it was feasible to outsource the program to a tourist agency so that Lankester could focus on technical issues within the garden.

Another step to improve ecological education at Lankester Garden was the formation of alliances with other organizations. Our group approached the Audubon Society in the United States, Rainforest Aerial Tram Foundation in Costa Rica, and the WPI Biology Department in order to create collaboration with Lankester. These alliances will serve to increase research capabilities and educational opportunities at Lankester Botanical Garden.

Our group has also created a web page with the assistance of a University of Costa Rica graphic design student. The combination of her design skills and our group's computer skills has allowed us to create a useful and pleasant web site.

An IQP examines the interaction of science and technology with society, applying critical and methodical thinking to current social issues. Using our methodology, this project has created a bird watching program for Lankester Botanical Gardens. This process has required several different skills, including scientific thinking, mathematics, management, and ecology. Mathematical skills were necessary for the computation of the cost estimate. New management methods are available that will benefit the business practices of Lankester Botanical Garden. There are many ecological aspects to bird watching, some of which have been addressed in this project. Through the improvement of information distribution, the creation of alliances and the implementation of a bird

watching program, Lankester will be able to offer a much more educational experience for its customers. We see this project as a way to increase environmental awareness for new visitors to Costa Rica as well as for experienced bird watchers.

2. Literature Review

This literature review is meant to examine all aspects of the planning that will go into creating a bird watching program at Lankester Gardens. It must be shown that there is sufficient interest in the birds of Costa Rica to provide such a program. The literature review discusses general knowledge about the bird population as a whole as well as several popular species. Marketing is important to the creation of a bird watching program. Because of this, this review includes discussion of several marketing strategies and how to use them. In order to provide a well attended and satisfying program, our team will consider transportation. This chapter reviews literature concerning transportation for tourism. Personnel and fees are also important aspects and the research we have done is provided here. As this will be a relatively large-scale project, we will analyze its cost. This literature review contains background information on cost analysis and specific approaches. Case studies on several other nature programs are included. One of these case studies was conducted in the United States and one was conducted in Costa Rica.

2.1 History and Geography of Costa Rican Birds

This entire following section is derived from Janzen's 1983 book Costa Rican Natural History, pages 502- 528. The birds of Costa Rica are largely studied, and much about their lifestyle is known. A step towards understanding entire tropical ecosystems is to study tropical birds. Because of its national parks and protected areas, Costa Rica is a prime place to study many different species of birds, also called avifauna.

The birds of Costa Rica include both residents and migrants. Most of the water birds are migrants, while land birds include both residents and migrants. Land bird

migrants spend six to seven months in Costa Rica, while water bird migrants spend most of the year there.

Four "avifaunal zones" have been recognized in Costa Rica. These zones correspond to the four major geographic sectors of the country: the northern Pacific lowlands, the southern Pacific lowlands, the Caribbean lowlands and the Costa Rica-Chiriqui highlands. The smallest group of avifauna of the lowlands resides in the tropical dry forests of the northern Pacific lowlands. As a result of deforestation, species of the dry forest may spread into more humid areas. Birds of the northern Pacific lowlands live in deciduous and evergreen vegetation as well as savanna. The water birds reside in swamps. During the dry season, avifauna either adapt to food shortages or migrate. Avifauna in the Caribbean and southern Pacific lowlands live in tropical rain forests, where there is a short dry season. Neotropical groups including antbirds, jacamars, toucans, and tanagers live in this avifaunal zone. More than one half of the country's avifauna population is found in the Costa Rica Chiriqui highlands. The kinds of birds that are found depend on the elevation. Groups of tropical birds are found at lower elevations while a variety of other groups are found higher.

Weather variations cause fluctuations in food availability, leading to variation in species population. For example, the availability of insects is dependent on the season. In the lowlands, insects are abundant in a mild dry season, but their numbers may decrease in a long rainy season. In the middle regions, insect numbers are susceptible to fluctuation. In the high elevations, high rains keep the insects away until the dry season when they are abundant. Similar types of availability and fluctuation are seen in flowers

and fruit. The amount of rain and sun may also affect avifauna. Extremes like dry season sunlight and cold, heavy rains can affect flight and nesting, respectively.

The breeding period of avifauna varies with the species. This is because most species breed at the point when nutritional resources are highest. For example, nectar feeding birds, like hummingbirds, breed when flowering plants are most abundant. Some species depend on the weather to indicate breeding time. For example, owls breed during the dry season when the nights are clear, in order to find satisfactory amounts of food.

Many species of tropical birds have low offspring survival rates during the breeding period; the probability of a successful brood is only one in five or one in six for those species. Because of this, the breeding period is long and several attempts can be made. Many resident species of avifauna wait for the departure of migrants to begin breeding. This may be due to food availability or competition.

Due to changing water levels, seasonal movement of avifauna is recognizable in the migration of water birds. The altitudinal migration of other species is also recognizable. A general pattern in Costa Rica is the movement to higher elevation in the dry season and the movement to lower elevation in the wet season. Stiles and Skutch (1989:40) note that this type of migration is carried out by Three-wattled Bellbirds and Quetzals. Many nectar and fruit feeders also use this migration pattern.

Birds and their environment depend on each other. Birds in the Costa Rican ecosystem function to disperse seeds and as pollinators. Many tree species depend solely on birds for seed and fruit dispersal. Because of this, birds are in part responsible for spacing and diversity of trees in the natural environment. Birds depend on large, unspoiled sections of forest for their diverse and complex communities. In parallel, many

plants of the forest depend on the birds for survival. This relationship has been studied and shown to be mathematical. When a patch of forest is isolated, the decline of a bird species is exponential. This, in turn, affects the plants of the forest. Janzen feels that, in order to survive deforestation, the best chance for Costa Rican avifauna is the use of the national park system for protection. National parks are places where birds can live and breed undisturbed. Because of the high rate of land consumption, it is necessary for their survival to have a place that is safe.

2.2 The Birds of Costa Rica

Costa Rica is home to more than 850 identified species of birds. This is more than in the whole of North America and about 1/10 of the world's total (Baker, 1996: 53). Bird watching in Costa Rica is very popular because of such a large number of species in such a small area. Many of the birds of Costa Rica are relatively easy to see because of their bright colors. Baker (1996:53) feels that the best place to look for birds is in an open area or near a watering source. Dense forest makes for difficult viewing. Dunlop (1999: 49) says that the best time for watching is from dawn to 9:00A.M. and at dusk.

Many species of water birds are found in the northern Pacific lowlands, and the Palo Verde National Park is known for its bird watching opportunities. The southern Pacific lowlands allow sighting of tropical species, among which are jacamars and parrots. Toucans, or "flying bananas," are also seen here (Baker, 1996:54). Costa Rica is home to six species of toucan.

2.2.1 Popular Costa Rican Birds

Some popular types of birds to spot are the hummingbird, macaw, and quetzal. Hummingbirds can often be seen feeding at flowers, held aloft by their rapidly beating wings. Baker (1996:55) reports that a hummingbird's wings can move up to 100 beats per second. Costa Rica has fifty-one species of hummingbird.

Macaws are brightly colored with yellow, green, scarlet and blue feathers. There are two species of macaw in Costa Rica, the scarlet macaw and the great green macaw. Scarlet macaws are in danger of extinction due to deforestation and poaching. They can, however, be seen at Corcorado and Carara National Parks, where their numbers are higher than in an unprotected environment (Baker 1996:56).

The quetzal has vivid green plumage and is quite rare. Baker (1996:57) points out that they have been worshipped in ancient cultures and also killed for their plumage upon their discovery by Europeans. However, the bird is protected by national parks and is quite frequently seen in these safeguarded places.

2.2.2 Lankester Gardens and the Birds of Costa Rica

Because Lankester Gardens is home to many different species of plants, it is also home to many species of birds. Lankester Gardens attracts many indigenous birds and also many migratory species. The birds are drawn by the large quantity of native and foreign plant species.

2.3 Promotion of Bird Watching Program

Before planning any project related to tourism, it is important to gain an understanding of who the potential customers are and what their needs and expectations

are. With this information, an efficient marketing campaign can be designed and implemented targeting these specific groups.

The U.S. Department of Commerce has described a process to identify these potential customers and their needs (Hausner, 1981: 145-152). To develop a successful bird-watching program, the target markets must be identified and their needs must be met. This process involves many different procedures, including measuring the market potential, designing an efficient and effective marketing strategy, and the implementation of this strategy.

2.3.1 Measuring the Market Potential

The U.S. Department of Commerce has detailed a method for measuring the market potential (Hausner, 1981: 153-167). According to the Department of Commerce, the set of potential future customers and current customers is called a "market." A marketing approach aimed at the entire market of an international tourist attraction would be an extremely inefficient strategy. The Department of Commerce believes that the most effective approach is to separate the market into smaller groups with similar needs or other similarities, and to employ a different marketing strategy for some or all of these segments. This "divide-and-conquer" strategy is called "market segmentation."

According to Hausner, an ideal market segmentation would result in the division of the total market so that the members of given subgroups respond the same to various marketing programs. A good division allows the marketer a number of advantages. These advantages include the targeting of the most profitable market segments, the ability to effectively match advertising campaigns to the target audience, the modification of the product to be more appealing to a certain group, and the ability to chose the media and

timing of advertising campaigns. The Commerce Department believes that if the whole set of potential customers is very similar in needs or in marketing strategy, there is no need to segment the market.

To best create a good segmentation, says Hausner, the current group of tourists should be analyzed and used as a model for the primary target market. When examining this group, many different variables must be accounted for. Demographic variables, including age and income, and geographic variables, such as origin and destination are important for consideration. Behavioral variables, such as the length and the timing of the trip, and psychological variables, including the motivation for travel, are also important. The travelers' motivation and their needs should be seriously considered and factored into the segmentation, according to the U.S. Department of Commerce.

There are several other factors that may influence the decision of the groups on which to focus. Hausner believes that once a market segment has been identified as predominant, its size, spending behavior, ability to travel, and ability to be reached and influenced must be considered. For example, if most travelers in the area are college-educated, married Americans who are interested in nature-based experiences, they should be chosen as the primary target audience for the marketing campaign. Choosing the most important divisions and disregarding the least important differences is an important step and can be done algorithmically from survey data.

2.3.2 Designing an Effective Marketing Strategy

Once the target market groups have been selected, an effective marketing strategy focused on those groups must be devised. In the 1981, the U.S. Commerce Department (Hausner, 1981:168-202) described the process by which a marketing strategy can be

developed for a tourist attraction. The Commerce Department identified four major components of a marketing strategy, which are all variables under the control of the marketer. These variables are product, which is the set of all goods and services offered, promotion, pricing, and distribution.

The U.S. Department of Commerce recommended creating two strategies, a short-term plan of about a year, and a long-term plan for the next five years. The short-term plan, they said, should focus on the optimization and improvement of existing attractions and resources. The long-term plan should focus on new areas of growth and development.

2.3.3 Educational Travel as a Market

Since the beginning of recorded history, travel has been used as a means of education (Weiler, 1992:15). The educational travel industry today is a fast-growing and competitive business (Weiler, 1992:16). Unlike other forms of tourism, educational travel opportunities are not marketed through traditional guidebooks or advertising campaigns. Instead, information on these educational opportunities is made available through publications that focus on educational travel (Weiler, 1992:16). Some of the most popular of these guides are Learning Vacations, The Guide to Academic Travel, and Travel and Learn: The New Guide to Educational Travel. Non-profit organizations also have a role in the promotion of educational travel experiences. The Audubon Society organizes educational trips to numerous locations around the globe several times a year (Audubon 2000).

In addition to being informative, the author Weiler (1992:18) says educational activities during leisure time can help justify the time expenditure to those vacationers

who feel the need to get the most out of their experience and who do not want to waste time. According to Weiler (1992:19), knowing that they are spending their leisure time engaged in a productive activity helps some people on an educational expedition to relax.

Weiler (1992:20) also believes that the main differences between a tour guide and a guide in an educational experience lie in the information conveyed and the way it is delivered. A tour guide's main function is to entertain the audience and promote the image of the site, a task that combines elements of acting and salesmanship. In an educational experience, the guide is expected to be more objective, relaying larger quantities of information without trying as hard to maintain a preset image of the site. Guides in an educational environment must be more knowledgeable than are traditional tour guides.

Weiler (1992:21) recommends that educational recreation experiences be based on the following three stage model. The first stage, planning, encompasses anticipation and the introduction of the experience's objectives. The second stage, carrying out, is the actual journey to and from the site and the on-site experiences. In the third stage, evaluation, the experience is recalled and discussed. The evaluation stage allows the participants to convert their new experiences to memories, and it allows the providers of the experience to gather invaluable feedback for future improvements to the program.

2.3.4 Nature-Based Tourism as a Market

Martha Honey (1999:54) observes that over the past few decades, there has been an increased trend of traveling to and vacationing in areas that boast an unharmed natural environment. She says that this non-consumptive nature-based tourism has evolved further into the large industry of ecotourism, also called sustainable tourism. The focus is

on promoting natural environments as areas for travel. Guests reside in and are educated about these natural areas. Because of the traveler's immersion into the environment, this type of tourism has obvious benefits. Some benefits are access to an otherwise contained area, a heightened understanding of the area and conservation of the surrounding environment.

Ecotourism is a much larger market than education-based tourism, especially in Costa Rica. According to a 1980 survey in the United States, more than 1 million Americans participated in 4 million international trips for the purposes of viewing nature in a relatively pristine condition (Weiler, 1992:106). Costa Rica's tourism industry is the third largest source of foreign income (Weiler, 1992:107). This is largely due to the country's diverse wildlife and extensive system of national parks and nature reserves, which encompass about 27 percent of the land (Weiler, 1992:107).

There is a large market for this kind of vacation destination. Currently, there are many people who are willing to pay for an unspoiled environmental experience. Many travelers will pay more for a "green," or natural, experience than for a more customary vacation ("Call of the Wild", 1999:78). Jacques Maillot, CEO of France's Nouvelles Frontiers, a tour company, recognizes this trend in travelers and ensures that if they want "green" tours, that is what will be offered ("Call of the Wild", 1999:78). Travelers leave these experiences in nature having had a pleasurable time as well as gaining a greater knowledge and appreciation for the land.

2.3.5 Implementing a Promotion Strategy

The U.S. Department of Commerce (Hausner 1981:192-198) believes that successful promotion strategy should encompass a variety of different methods. These methods include cooperative promotion strategies with other businesses as well as various forms of advertising.

According to the Department of Commerce (Hausner, 1981:192), several aspects of promotion should be considered when designing an advertising campaign. The Commerce Department believes that choosing an appropriate media for advertising is important. Each targeted market segment will be reachable through different media (Hausner 1981:193). People in the surrounding area may be reached through outdoor signs and pamphlets, where a campaign targeting a national or international market may use television, radio, or the internet.

2.3.6 Marketing on the World Wide Web

The World Wide Web has drastically altered the face of advertising. Web pages are inexpensive, and provide access to tens of millions of people world-wide. Web marketing is an ideal choice for campaigns targeting international tourists, because the people who can afford to travel to a foreign country for leisure activity are the most likely to have internet access (Barrett, 1997:36).

Unlike television or radio, users of the web must consciously choose to download each page. For this reason, a web page containing advertising must itself be marketed as interesting, entertaining, or informative. In order to attract the attention of interested parties, the web page's existence must be registered with search engines and linked to topically relevant sites (Barrett, 1997:37).

Ellsworth (1995:270) provides several strategies to encourage web users to return to a site regularly. She believes that a large site with a wealth of information will encourage users to return simply to finish reading what the site has to offer. Another popular strategy is to have a constantly changing or regularly updated section, providing anything from a comic strip to daily news or events. Other suggested strategies include making the site incredibly useful, like a search engine, or running contests to maintain user interest.

2.3.6.1 Web Design

Once a user has initially accessed a page, it is up to that page to keep and maintain the user's interest. Ben Schneiderman (1998:18), one of the world's top experts in computer interface design, believes that the specific audience and their preferences are the most important factors to consider when designing a web page. To maintain user interest in a page, Schneiderman (1998:81) provides a number of guidelines for a visually attractive and satisfying page. In addition to a simple, logical layout, Schneiderman (1998:81) recommends using at most four colors, at most three fonts and only two levels of intensity. Blinking text or colors should be avoided, as it tends to irritate. An especially important section of the page can be emphasized with bullets, underlining, or an arrow (Schneiderman, 1998:81).

Schneiderman (1998:15) also describes five criteria by which the quality of a page's interface can be measured: time to learn, speed of performance, rate of error, retention of knowledge, and subjective user satisfaction. The time to learn the interface is measured by providing a group of users with a certain set of tasks. The speed of performance is how long it takes to complete a single task. The rate of error is a

measurement of the most common and frequent user errors and the difficulty of recovery from an error. Retention of knowledge is a measurement of the knowledge retained by a user over days, weeks, or months. Schneiderman (1998:15) believes that user knowledge retention is one of the best indicators of an interface's ease of use. Subjective satisfaction is how the user feels about the interface, and can only be measured with interviews or surveys. Satisfaction can be influenced by a wide variety of design choices, including color scheme, contrast, organization and layout of information, and response time. User satisfaction is the goal of every commercial web site, and can be improved by accepting user feedback.

Schneiderman (1998:74) provides basic guidelines for web page creation that ensure user satisfaction and ease of use. The most important element in the design of any interface is consistency. Without consistency in terminology, color, layout, fonts, and actions, a user may lose interest or become frustrated (Schneiderman, 1998:74). He says that the design of the page should account for both expert and novice users. Adequate help with the features of the page should be provided for first-time users, and short-cuts and other time-saving devices should be provided for users already familiar with the interface. Schneiderman (1998:74) also stresses the importance of informative and helpful system responses to user actions.

Another important factor in interface design is the reduction of user short-term memory load, which is achieved by following the Rule of Sevens. The Rule of Sevens says that an average human can process only seven, plus or minus two, items in short-term memory simultaneously. Schneiderman (1998:75) applies this rule to interface design, limiting the number of significant items on a page or menu to seven.

The most important consideration for a web page aimed at an international audience is universality of access. Most of the users on the World Wide Web are not using a graphics based browser. For these users, it is important to provide a text-only version of the page. Several versions of the page should be provided in different languages if the intended audience is spread across several countries (Schneiderman, 1998:576).

2.4 Transportation

Inskeep's Tourism Planning discusses using existing transportation systems as a means of cutting costs (1991: 177). In the case of Lankester Gardens this would be applicable through the use of vans already owned by the University of Costa Rica or by public transportation. In Clare A. Gunn's book of the same name, Gunn suggests the use of public transportation, such as buses (1979: 113). Gunn suggests the maximum use of public transportation but also suggests the use of private modes as a supplement (1979: 118). Inskeep notes that the majority of hotels, which are tourist oriented, are located near major forms of public transportation and this should be taken advantage of (1991: 167). Private modes, such as taxis and shuttles, can be used as a more specific and comfortable means of reaching the final destination (Gunn 1979: 117). Both authors suggest using public or existing means as the most cost-effective means of transporting tourists. However, neither author dismisses the usage of private means of transportation if public transportation is unable to accommodate the needs of tourists.

2.5 Case Study: Massachusetts Audubon Society

The Massachusetts Audubon Society is the largest conservation organization in New England. The society has forty wildlife sanctuaries that are open to the public. Each provides a variety of conservation and education programs.

The Broad Meadow Brook (BMB) Conservation Center, located in Worcester, Massachusetts, is one of the Massachusetts Audubon Society sanctuaries. BMB has one hundred and sixty species of resident and migratory birds.

A personal communication (April 20, 2000) with Gail Howe of BMB provides the following information about the sanctuary. Howe is the Conservation Coordinator of BMB. She coordinates public programs by creating ideas, hiring instructors, scheduling them and promoting them in the newsletter and is the supervisor of education and outreach. In addition, she is in charge of maintaining a healthy sanctuary.

Howe explains that birding programs at BMB can vary from extensive ten-week courses to Saturday morning walks. Specialty programs such as trips to Plum Island in Massachusetts to study birds of the coast and trips to Maine to study puffins are offered at BMB. The sanctuary also runs research programs such as counts and surveys in which the public can participate.

Most of the guides at BMB have been working with the Audubon Society for years. New guides, however, go through the ten-week advanced course. They are required to know about the birds at BMB and are active at the sanctuary. Before running their own programs, these guides must go through an observation period. No outside training is required for these guides. The Audubon Society gives them the experience that they need to become guides.

Howe calls some of the guides at BMB seasonal "natural history guides". These guides receive a week-long training as well as one training session a month. These guides are trained to operate specific programs and work on a volunteer basis. However, when they do present a program at BMB, they are paid. All natural history guides have an undergraduate or master's degree in a field of science or education.

The Audubon Society of Massachusetts has several Master Birders. These ornithologists are available to each sanctuary in the organization. They are the link with international birding groups. At times, the Master Birders coordinate natural history trips outside of the country. Howe says that one of the tasks of a Master Birder is to document rare birds.

The sanctuary owns a fifteen-passenger van, and BMB offers transportation to some off-site programs. Howe mentions that there is a much better response to programs when transportation is provided. The Worcester city bus makes a stop at the BMB sanctuary, but Howe is not aware of the number of patrons who use that service.

BMB promotes its programs through a web site, newsletter and press releases. The sanctuary works together with other bird clubs by volunteering for each other's functions. Howe says that BMB appears in several regional guides including the "Blackstone Valley Visitors' Guide", "Hike and Bike Trails of Worcester" and "Guide to Wildlife Sanctuaries in Massachusetts". BMB is an official visitors' center for the Blackstone Valley.

Broad Meadow Brook offers a wide variety of educational and conservation programs. The following information has been taken from several BMB pamphlets. The educational programs offered include both at-school activities and on-site activities

("Educational Services", ND). "Backyard Birding" and "Fanatic About Birds" are two programs offered by a BMB guide at a participating school. The first is an hour-long program that deals with bird basics, and the second program includes the development of a bird research station. "Birds of a Feather" is an on-site program that teaches students how to observe birds and interpret their behavior.

BMB also offers adult programs at the sanctuary (Newsletter, May-August, 2000). There are monthly monitoring walks to document species and Saturday morning walks that explore the habitats of the sanctuary. "Birding Habitats of Massachusetts" is a program that consists of ten trips to observe the habitat types of Massachusetts. The sanctuary also hosts seasonal birding tours, such as "Winter Birds of Plum Island" and "Spring Bird Migration Spectacular" (Newsletter, Jan-April, 2000). "Winter Birds of Plum Island" is a program with provided transportation. Species such as shrikes, snowy owls, bald eagles and snow buntings can be seen. "Spring Bird Migration Spectacular" is an on-site program for intermediate to advanced birders. Waterfowl, warblers, hawks, and shorebirds are studied with an emphasis on birdsong. BMB also offers beginners' classes in which residential and migratory birds are identified and bird watching basics are introduced.

The Massachusetts Audubon Society holds an annual Bird-A-Thon. It is a statewide program with the society's sanctuaries as participants. The competition consists of a twenty-four hour species tally. The Bird-A-Thon raises money for sanctuary conservation efforts.

2.6 Business Planning

A key part of running a successful business is advance planning. With a firm plan, success is more readily achieved than without one. The following section describes business planning techniques.

2.6.1 Why Use Business Planning Techniques?

According to Stephanie Marrus (1984: 4), the point of business planning is to establish the future of an organization. Business planning is not just one thing, but rather a grouping of financial and business terms. She says that the main reason for a business plan is derived from the basic principle that every corporation and organization is defined by only a handful of key decisions. From this simple fact, the need for a business plan arises. The purpose of planning is thus refined to a simplistic notion that one must be able to determine what these key decisions are and to determine the appropriate course of action.

2.6.2 Why use planning techniques at Lankester Gardens?

The concepts of business planning in small non-profit organizations such as Lankester Gardens are fundamentally the same as discussed by John M. Bryson in Strategic Planning for Public and Non-Profit Organizations. The differences are that the issues to be considered rely heavily on the private corporate world, which offers similar services or products. Bryson discusses that non-profit organizations lack design creativity in their planning techniques. He stresses the importance of a complete business plan as a necessary tool that is often underused in non-profit organizations. The difficulties of a non-profit organization apply to several issues at Lankester Gardens, in

that the problem of a lack of funding is common among non-profit organizations. Bryson notes that corporate entities have a distinct advantage in funding over non-profit organizations. This advantage in funding is due to the greater earnings that most profit organizations receive. Funding as start-up capital is a major stepping-stone in the implementation of a business plan or new venture, such as the bird watching program at Lankester Gardens. Bryson also stresses that the use of strategic planning can be a solution to some of these problems (1995:3). Long-term goals can be accomplished through short-term accomplishments.

2.6.3 Planning

Marrus (1984: 5-10) categorizes business planning into two different types, strategic and operational planning. Strategic planning is based in the company's mission and long-term objectives. It is used to determine the best course of action in order to accomplish the organization's goals and objectives. It provides the basic direction in which a company needs to examine its long-term goals. Strategic planning requires an internal evaluation of the current market position of a company and the market position the company desires to have in the future. This is the type of planning that is done at the top levels of an organization and is done in a very broad manner. Operational planning is done on a smaller, short-term basis and is the job of lower managers.

2.6.3.1 Strategic Planning

Strategic planning is used on a long-term basis and is outlined by Marrus (1984: 7-8) as a three to five year plan with broad implications. It requires a series of "what if" questions. Included are questions regarding the stability and direction of the industry and market in general. These "what if" questions require an organization to come up with

several scenarios and plans to accommodate for all possible outcomes through planning. This requires planning even for situations that may seem absurd. One such example that Marrus (1984:7) gives is that of interest rates during the 1970's. In the 1970s, interest rates were low at about 8 percent. Due to this, it would be absurd to plan for the considerably higher interest rates of the early 1980s, which were around 15 percent. This unpredictability is what makes the strategic planning of a business so important. Marrus asserts that unforeseen situations and future complications can be better dealt with if one already has planned for such an outcome.

The basic tenets of strategic planning are based in the concept that all outcomes and all situations that may occur are foreseeable; therefore, they require a course of action. Long-term situational and broad topics are usually discussed and, according to Marrus, (1984: 4) they lead into a natural fit with the operational planning of a company.

2.6.3.2 Operational Planning

Commenting on operational planning, Marrus (1984:8) states that it is the short-term portion of a business plan and is the logical progression from strategic planning, which deals only with long-term and broad topics. Operational planning deals with existing resources and the situations that are found in the daily running of a business. It is the basis for the construction of a detailed "blueprint" of a company's needs and goals. It deals with aspects as varied as personnel, marketing, facilities, and competition. Unlike its predecessor, operational planning deals less with long-term questions, like future interest rate hikes, and instead deals with short-term and very specific questions. Operational planning gives detailed and precise answers to important questions regarding the daily running of the company. This planning is done less by the heads of a company

or organization and more by the people in charge of running smaller components of a business.

2.6.4 Planning vs. Budgeting

Marrus (1984: 6) stresses the importance of not mistaking budgeting for planning. The allotment of resources, she says, should not be mistaken for a proper business plan. Budgeting requires the determination of the profit and loss of a company but lacks in its ability to predict any proper course of a company and its future. Budgeting is important to any company, but it should not serve as a substitute. Marrus believes that it is just one component of the "big picture" that a company takes into consideration through long-term strategic planning.

2.6.5 What Makes Business Planning Work?

The basic tenets of business planning alone cannot work if those who run the organization do not accept it, according to Marrus (1984: 9). She believes that in order for planning to work, it requires the acceptance of the people who are involved. That is the most important step, and without it no plan can work. Some of the things that are also required are feedback, implementation, and compatibility of the plan.

Feedback, she says, is the most important step in management, and from it all other portions of a plan can be shaped and refined. Feedback is vital because all people involved should add their input into a situation. With this method, things are not missed and no one is left out. She also tells us that in order for a plan to succeed, all people involved must be informed and must know the reasoning for all actions. This is done through communication, and then justification for decisions can be made. Dissension can

be caused by lack of knowledge about the reasoning for actions. Feedback also allows for common ground to be found and for compromises to be made.

The implementation of decisions is very critical and, according to Marrus (1984: 10), the lack of implementation destroys even the most well-laid business plan. A good plan is based on the premise that its plans will be followed to the letter. It is based on all parts being carried out to their full intent, and it considers the eventualities that arise from the beginning elements in order to accomplish its final goal. One piece of the plan cannot be removed without consequences. Ignoring even small elements in a plan can derail the final desired outcome. Failure is often found in missing small details and passing them off as trivialities. Also unforeseen consequences can cause similar problems. Inept execution can be the downfall of a well-laid business plan.

Marrus (1984:9) tells us that it is important to success to factor in the compatibility of a plan for the company while constructing it. One must determine whether or not one can execute the decisions and implement the necessary policies in order or accomplish a goal. The functional relationships of a company or organization are hard to change and must be accounted for in a business plan. One has to determine whether or not the finances can be allotted or if the personnel can be acquired in order to accomplish the appropriate and desired outcome. The example that Marrus (1984: 10) gives is that of a company that never writes memos and is very informal in all aspects of the daily operations of its holdings. She relates that a company such as this will not respond well to an extended and complicated plan thirty pages in length. To be compatible in this case one, would be required to accommodate for the structure and attitude of the company.

2.6.6 Developing the Plan and its Component Structures

A business plan is like any other structure comprised of several elements to make a whole. The components of a business plan as laid out by Marrus (1984: 13) are the mission, situational analysis, objectives, strategy, and tactics. These are all separate and discreet structures based on the premise that they will eventually comprise a whole and that they must work together in order to accomplish that. These five parts are the basic premises on which a business plan is formed. They build on each other and form a logical progression.

2.6.6.1 The Mission Statement

Marrus stresses that the mission statement is essential to a business plan, adding direction and establishing a purpose to the plan itself (1984: 13). She also states that though the establishment of a mission statement may seem trivial and basic, it is most definitely not. The definition of a mission statement is very simple. It is the self-analysis of the position of a company and what it hopes to accomplish. A mission statement in the case of Lankester Gardens already exists; however, a re-evaluation of the mission statement may be useful. This early step will help the project have a clear source of objectives and direction.

2.6.6.2 Situational Analysis

Situational analysis, also known as environmental scanning, is a description of the company as it exists in its present form (Marrus 1984: 15). The environments that need to be considered are the internal workings of the organization. In the case of Lankester Gardens this is an inventory of current personnel, available and required personnel, funds and available funds.

The key elements to consider when doing an internal analysis are the services offered, financial resources, available facilities, and labor resources (Marrus 1984: 16). This is an opportunity for the assessment of the strengths and weaknesses. This assessment must be done in order to determine areas of leverage and vulnerability within the company in relation to the outside world.

2.6.6.3 Strategy and Tactics

Strategy is the next logical step in the evolution of a business plan according to Marrus (1984: 18). She tells us that the situational analysis tells about the company's present position in the market. The strategy she explains proceeds to establish a pathway that leads to the future that was defined in the objectives. This is done in a manner consistent with the company's resources in the present.

Tactics is the area where the operational planning comes into use as Marrus tells us (1984: 19). She explains that tactics are a detailed description of how the strategy will be carried out. This requires a high level of detail, structure and specification.

2.6.7 Financial Data

Financial data can be collected and examined in order to determine feasibility of the business being planned (O'Hara, 1975:156). The first step that O'Hara mentions is that balance sheets are made and forecasts drawn up. He goes on to say that one has to establish the current assets and the liabilities, which one has accumulated or will accumulate. O'Hara states that the overall purpose of all the accumulation of the financial data is to establish projection statements. He says that these projection statements are usually done for at least a three-year period. The financial data that he mentions include

cash flow, balance sheets, an analysis of the break-even point (the point where the business starts to make money), and a summary of the projected profit and loss.

2.7 Cost Estimation

The forecast of a work output's projected cost is a cost estimate, says Stewart (1982:3). Cost estimates are important for several reasons. Increased prices due to supply and demand encourage careful maintenance of budget. As more natural resources are used up, supply decreases and demand grows. There is also an increase in the cost of technology due to new advancements.

Stewart (1982:3) believes that a way to contend with the increase in production costs is increased productivity. Productivity is the effectiveness of a system. Increased productivity is encouraged by a good cost plan. Cost estimation results in better use of resources and a higher rate of project completion. With the use of a cost estimate, fewer tasks overrun their budget. When a company successfully stays within a cost estimate, it is good for its reputation and its profits.

According to Brimson (1991:5), enterprise excellence needs to be maintained at all times. Enterprise excellence, he says, is the improvement of product and service through cost-effective activities. Brimson (1991:5) believes that activities must be cost effective, which means that their costs must be lower than the average cost of competition.

There are four basic kinds of work output according to Stewart (1982:10). They are processes, products, projects and services. When preparing a cost estimate, all types of output deal with the same basic cost components.

2.7.1 The Steps of a Cost Estimate

Stewart (1982:10) defines eight steps for the creation of a beneficial cost estimate. The steps are as follows: (1) definition of product, process, project or service; (2) development of an estimate schedule and procedure; (3) creation of a project schedule; (4) preparation of a statement of estimate guidelines; (5) estimation of the number of man-hours and amount of materials; (6) aggregation and computation of the estimate components; (7) publication of the estimate; (8) application of the estimate.

2.7.2 Defining the Project

All projects need to be defined as a process, product, project, service or a combination of these. Salaries of workers must be known before cost can be estimated. The cost of labor and materials can vary with geographic location, so details of this type must be known. Stewart (1982:20) indicates that the labor rate is determined by the skill, training and experience of the workers. In order to determine a composite rate for labor, the labor rate for a specific skill is multiplied by the percentage of man-hours of that skill. Gerstenfeld (personal communication, April 2000) mentions that labor rate also depends on demand and location.

He says that it is helpful to have examples of recent estimates and descriptions on hand that are similar to the present project. When utilizing these resources, it is helpful to identify their mistakes and inefficiencies, so as to avoid them in the current endeavor. Reference materials are also vital to an accurate cost estimate. Such materials could include volumes on accounting, cost control, economics and statistics.

An important part of the cost estimate is a work element structure. An example can be seen in Figure 2-1. This is an important framework, as it accounts for all parts of

the project. The use of such a system reduces the risk of redundancy in estimate calculations. The work element structure is a valuable tool for looking at the overall project and for developing a rank for estimate resources. The costs of the lower elements are estimated and summed to the higher levels.

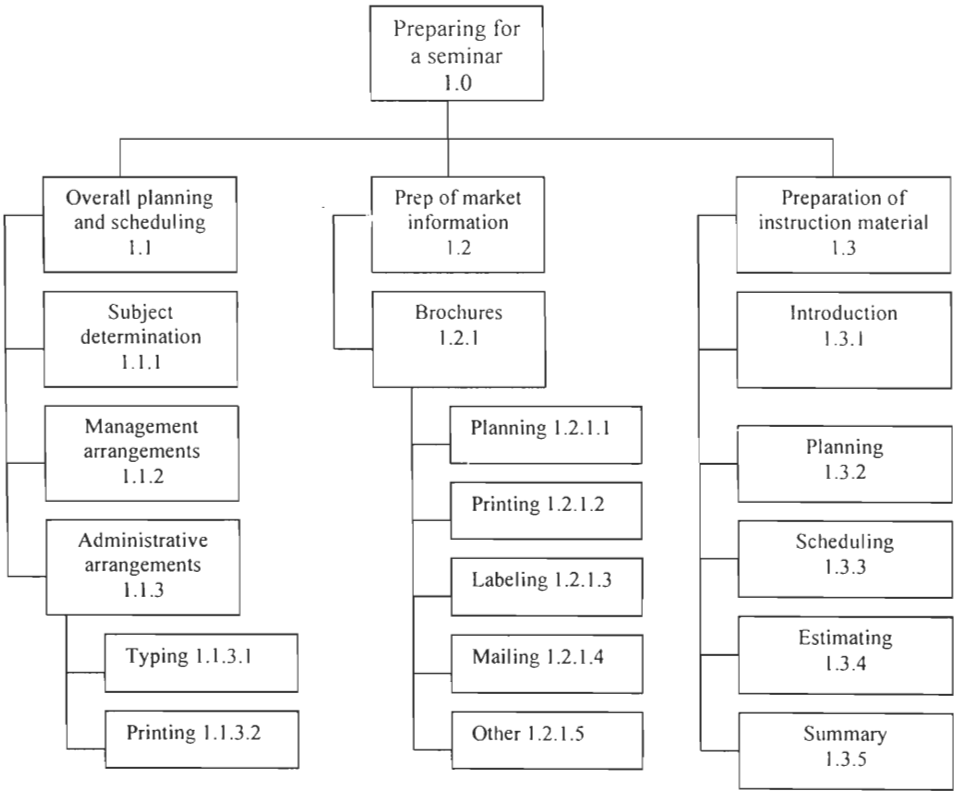


Figure 2-1. A Sample Work Element Structure. Adapted form Stewart's (1982:34)

2.7.3 Estimating Costs

Tanaka (1993:16) and his colleagues report that there are multiple categories of cost. Direct costs are those of material and labor. Direct material costs are those that result directly from the materials needed for the product or service. Direct labor costs are those that are incurred to pay laborers in all aspects of the project. Indirect costs, says Stewart (1982:15) include overhead costs. Tanaka (1993:17) says that overhead costs are

a result of payments such as facility rental, insurance and electricity as well as management and advertising costs and salaries. The total of indirect costs is usually approximately equal to that of direct costs.

The costs of materials and labor are usually estimated before other costs. The amount of materials needed is estimated from the drawings and specifications gathered. Then, a unit price is applied to the quantities.

2.7.4 Fixed and Variable Costs

The prediction of the cost necessary to cover a specific service output is created by use of a cost behavior pattern, says Brimson (1991:111). This pattern represents the fluctuation of cost due to changes in service output. It depends on fixed and variable costs. Variable costs are costs that change in proportion to service volume. Fixed costs do not vary with production.

2.8 One Approach to Costing

O'Connor (personal communication, April 20, 2000) has indicated a cost estimating approach that would be beneficial to this feasibility study. This approach includes examining fixed and variable costs and determining a break-even point. That point is where revenue starts to become profit. As discussed above, such a cost estimate requires knowledge of the project and others like it, a methodical approach and the compilation of direct costs.

2.8.1 Using Fixed and Variable Costs to Determine a Break-Even Point

The approach of determining a break-even point requires compilation of all direct costs. All fixed and variable costs must be included. O'Connor uses the cost of transportation to illustrate fixed and variable costs as shown in Table 2-1.

Table 2-1. Fixed and Variable Costs for a Transportation Example

Fixed	Variable
Fixed lease includes:	1) Payment of drivers
a) Repair and maintenance	2) Gas
b) Cleaning	

Source: Personal communication with John O'Connor, April 20, 2000

In Table 2-1, the cost of the fixed lease will be unchanged despite the number of people that use the transportation. The hours worked by the bus drivers will depend on the schedule. The schedule, in turn, is based on the "demand" or the numbers of customers expected in any particular time period. The amount of gas used will also vary due to these factors.

O'Connor believes that it is important to first set up a graph that shows the total fixed cost and the total variable cost, as shown in Figure 2. The cost is on the vertical y axis and the variable on the horizontal x axis. In this example, transportation is again used, and the variable is the time put in by the drivers. The costs used in this example are hypothetical. The total cost per number of patrons is determined by the location of the

variable cost line. When there are no customers, the total cost is simply the fixed cost. As the time worked increases, the total cost grows.

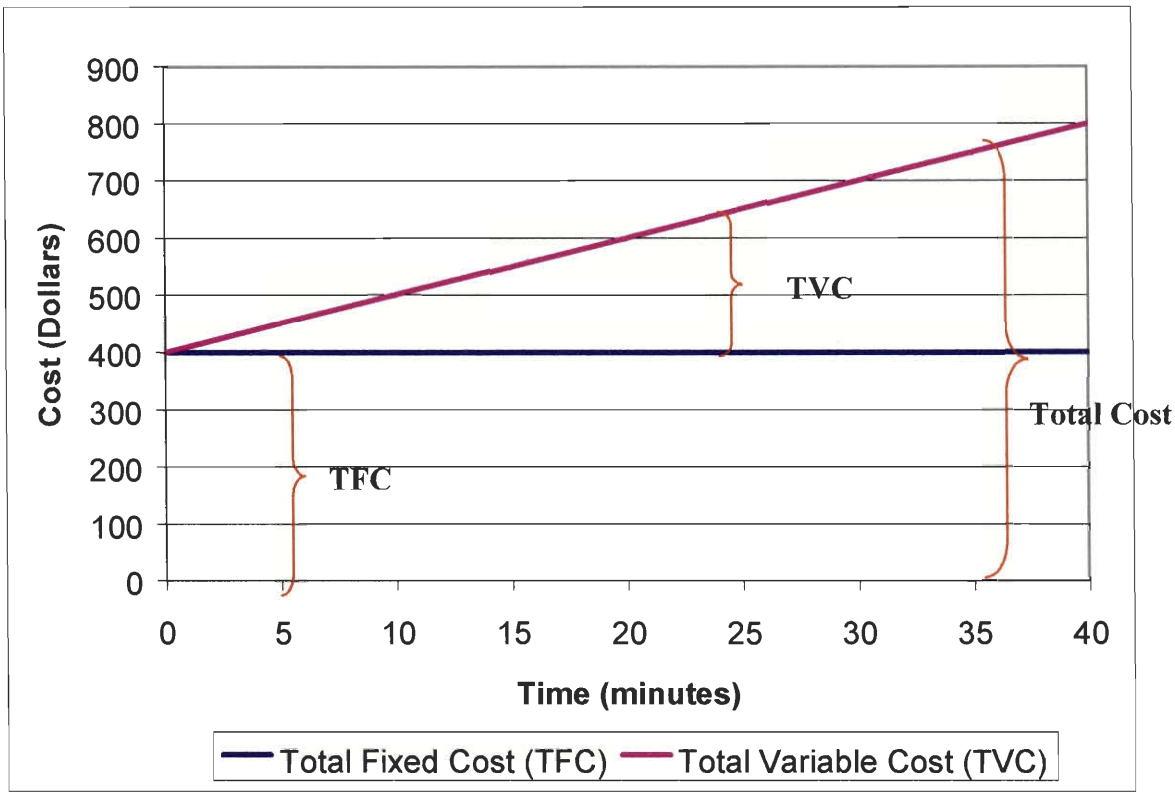


Figure 2-2. Break-Even Analysis, Including Fixed and Variable Costs

After the preliminary cost graph has been made, a line indicating revenue must be added. Revenue is the amount of money brought in by the service. In keeping with the transportation example, the revenue is the amount collected in the time period. By plotting the revenue vs. time, a loss (or profit) line is created. This line is plotted directly onto the preliminary cost graph. Because both lines are plotted using the same units, they correspond and can be compared. The point where the TVC line and the revenue line

intersect is called the break-even point. This can be seen in Figure 2-3. Anything below this point is a loss, and anything above this point is a gain.

The use of such a graphical approach allows understanding of the cost issues. The graph can be used to clearly show what conditions need to be met. It also can be used to determine what adjustments need to be made. The probability of meeting the variable quota needed to break-even must be examined. If there is a low probability that the break-even point can be met, the project itself must be reconsidered.

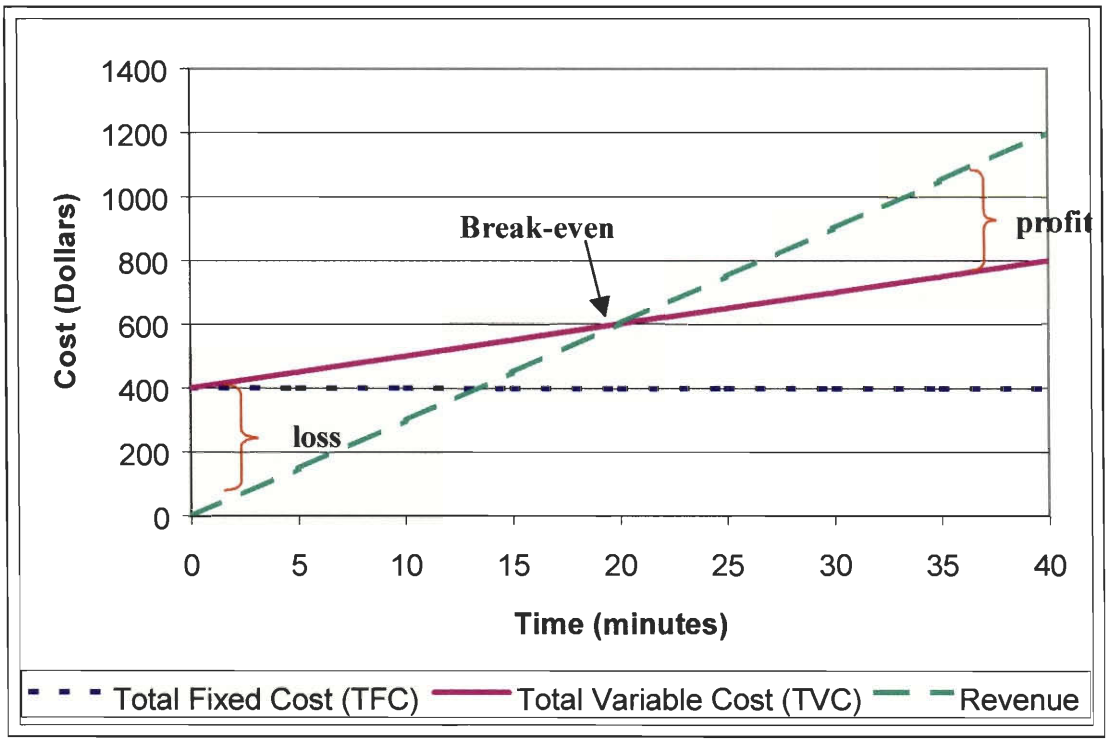


Figure 2-3. Break-Even Analysis Graph, Including Revenue Line

2.8.2 Sensitivity Analysis

A sensitivity analysis is a way to examine how sensitive the project is to each variable. For example, the reasoning of a sensitivity analysis could be as follows. If

there are ten customers, then the loss will be $200. If there are twenty customers, then the project will break even. If there are forty patrons, the profit will be $400. Statements like these allow adjustment of the variables until the desired profit is met. The variables could be either pricing or productivity related.

3 Methodology

The purpose of our project was to improve Lankester Botanical Garden's ecological education services through the development of a bird watching program. We also addressed aspects of ecological education by assessing the possibility of alliances with other organizations, promotion of the garden, and the creation of an informative web site.

3.1 Collection of Previous IQP Material

One of the first steps of this project was the retrieval of data collected for previous IQPs done in 1998 and 1999. That material included written surveys that were administered to tour groups at Lankester. Those surveys included information regarding the number of people who visited the garden in 1998 and 1999. This data assisted us in the determination of the number of estimated visitors per year, which is an essential element in performing our cost analysis research of the bird watching program.

3.2 Additional Data Collection

Our group located some additional data to aid in the formation of marketing strategies; namely the *1998 Tourism Statistical Yearly Report* and the *1998 Encuesta Aerea*, both compiled by Instituto Costarricense de Tourismo (ICT). These reports provided demographic and statistical information regarding the visitors to Costa Rica in 1998. This information was used to create a market segmentation and marketing strategy.

3.3 Investigation of Ecological Education in Costa Rica

We gathered information on ecological education in Costa Rica. This included information in important ecological issues and practices. Our group recorded information from interviews with Julio Sanchez, the president of the Organization of Ornithologists, and Yolanda Elliot, the commercial activities director of the Organization for Tropical Studies. We have also found information in periodicals and on the internet about ecological education in Costa Rica, which we believe added value to our findings.

3.4 Evaluation of Lankester's Resources

Our group examined the current capabilities and resources of Lankester Gardens. We did this by interviewing the people in charge of areas that we feel are important and relevant to a bird watching program and educational development. These interviews included Jorge Warner, the director of the garden, and Jaime Aguilar, who is in charge of field courses. First we interviewed Jorge Warner. In our interview we established the organizational structure of the garden. We received both the names and the responsibilities of every staff member and determined who their direct superiors were. Our team took an inventory of all resources within the garden itself for the development of a program strategy. We did this on a visual basis. The items that were recorded in our resource evaluation were buildings, equipment, informational systems, and other facilities such as outdoor picnic or rest areas. We have determined what funds are available in order to examine the feasibility of the program.

3.5 Evaluation of Lankester's Bird Species

An important part of promoting the bird watching at Lankester is knowing what types of birds can be seen at the garden. We requested the services of Jaime Aguilar to determine the species present. By doing this, we determined specific birds of interest for promotional purposes. It was useful to know what plants attract specific species and where in the garden they can be found. Our group made a rough diagram of the garden indicating which species are found where.

3.6 Evaluation of Lankester's Current Ecological Education

We examined the ways that Lankester educates the public through its programs by interviewing Jaime Aguilar. He gave us a list of field courses at the garden. We have also interviewed Julio Sanchez who discussed with us his assessment of ecological education at Lankester Botanical Garden. We used this information as a basis for developing a bird watching program that is feasible for Lankester.

3.7 Observation of Other Gardens and Bird Watching Programs

Our group visited other botanical gardens and participated in bird watching programs in order to determine their content and procedure in Costa Rica. We have examined how other gardens handle programs involving ecological education. One location we visited was INBioparque. This park is operated by the biodiversity institute of Costa Rica. At INBioparque, we examined the availability of interactive displays, aimed at conservation and the promotion of ecological education. Our group gathered data on how the park handled transportation and their pricing methods. Also, we used this opportunity to examine different elements of the park, such as the placement of signs

and different attractions. Our team used this information to make recommendations for improvements at Lankester.

3.8 Study of Bird Watching Guides

We examined the procedures through which bird guides can be trained and have located where training takes place. We accomplished this through interviews with tourist agencies and the Instituto Nacional de Aprendizaje. We also obtained a list of certified guides from ICT that Lankester Garden can use for hiring purposes. Through communication with tourist agencies, we found that they are a resource for guides as well. Some employ their own guides and make them available to outside organizations.

3.9 Examination of Tourist Agencies

Our group consulted four local businesses that provide tourism services to find out about their programs and procedures. A list of tourist agencies was created from the listings in the telephone book. There was no specific strategy to the selection of tourist agencies. Once a selection was made, our group screened these agencies by asking two questions: Do they provide trips to Cartago and do they offer any bird watching programs at present. The agencies were asked about travel to Cartago to ensure that if they were considered for collaboration with Lankester, they would be able to provide transportation for their clients. Tourist agencies that were currently offering bird watching tours were chosen because our group was interested in acquiring information about the tours.

In addition to inquiring about bird watching programs, our group asked about the training that is required of each agency's guides. We also recorded the process each agency uses to hire guides and whether or not they employ guides on a full time basis.

Our group asked each tourist agency if Lankester was included in any of their packages. Lankester will be able to use this information to determine where to advertise their bird watching program.

Outsourcing is one option that we explored due to its low initial startup cost potential. We went to a tour agency in the San Jose area that offers the provision of the necessary personnel to run the program. This will allow for minimal loss to the garden if the program is unsuccessful. We presented the agency with the specifics of the program.

3.10 Evaluation of Hotels for Promotional Use

We also found some hotels that are popular for tourists. A selection of hotels was compiled by cross referencing three popular guide books. These guide books are *Lonely Planet's Costa Rica, Fodor's Costa Rica* and the *New Key to Costa Rica*. We chose to visit the hotels that were found in all three guide books. The hotels were asked a series of prepared questions concerning patrons, including how many tourists stay at the hotel per year and what the prime season is for tourists. They were also asked about marketing strategies and services for their guests. Through these questions, our group determined if there were any hotels that were especially appealing to bird watchers or tourists interested in a natural environment. We investigated the possibility of cooperation with these hotels for promotion of the program.

3.11 Evaluation of Transportation Options

In order to determine the most cost efficient form of transportation for tourists to and from Lankester Garden, we explored multiple options. These options include leasing, buying, outsourcing, and renting vehicles.

Our group examined the next two options, leasing and buying, by determining what companies in San Jose lease or sell appropriate vehicles and at what costs. Once we located dealerships, we examined the available options and determined the best prices. We visited six dealerships in the San Jose area and received information regarding commercial twelve to fifteen passenger vans. We then inquired about the prices to buy and the prices to rent or lease

In order to determine if the option of renting was feasible, we visited eight major car rental agencies. At those rental agencies, we inquired about the possibility of renting the appropriate type of van and asked about the cost to rent on a daily or weekly basis. We also inquired about and the possibility of the agency providing their own drivers.

Our group interviewed Susan Sequirra at Costa Rica Temptations, a private tour company in San Jose that specializes in outsourcing nature-oriented tours to different areas in Costa Rica. We discussed the terms of contract and the services that Costa Rica Temptations would be able to provide for Lankester.

3.12 Development of Specifics for Bird Watching Program

After considering all of the options necessary to a bird watching program, we focused on determining the specifics of the program. These specifics include time of day for the tours, pricing, guides, and transportation. We developed these specifics through the interviews with Jaime Aguilar and Julio Sanchez, experts on birds watching, as well as through analysis of the transportation and guide information.

3.13 Promotion

Our group designed and recommended a marketing strategy. We determined accurate market segmentation with the use of the use of previous WPI projects at the garden and the ICT statistical reports. Our group devised both long-term and short-term strategies for the handling of product, pricing, distribution, and promotion. The product strategy includes short-term recommendations for optimizing the usage of already existing facilities as well as long-term recommendations for the involvement of other businesses and the community, human resources development, long-term optimizations, and the development of events and other attractions. The promotional strategy involves relationships with schools, community groups and other businesses for the purposes of publicity. We examined the possibilities of submitting free public service announcements to radio, television, and newspapers. The possibility of paid radio advertisements was also examined. We also investigated cooperative promotions with other tourist attractions or agencies, and hotels. Our group located optimal locations for the placement of pamphlets and brochures. For the development of a pricing strategy, we investigated different prices for local and international guests as well as package deals with other businesses. Developing a distribution strategy for a bird watching program means finding an efficient and comfortable way of getting the guests to and from the site. We investigated arrangements with tourist agencies and hotels.

3.14 Web Site

Our group participated in the design and implementation of a new web site for Lankester Botanical Garden. This site will aid the garden in the promotion of its programs and provide educational information to visitors. Through a series of meetings

between members of our group, our liason, and a graphic design student at the University of Costa Rica, the site was carefully planned. The graphic design student then supplied our group with the necessary images. Other information and photographs were obtained from the garden. By combining these elements with our group's knowledge of programming, a web site was implemented.

3.15 Cost Estimation

For each program considered, we estimated its cost. We did this by gathering all direct and indirect costs. We specified fixed and variable costs and determined admission rates for the programs. The cost estimation procedure we have followed is the break-even point analysis, as discussed in the Literature Review, Chapter 2. We determined the rates by comparison with similar organizations and recommended adjustments to them as needed with regard to the break-even point. This procedure will allow the garden to see clearly the fixed and varied costs and the revenue generated for each feasible program. We adjusted the break-even point based on the probability of generating the necessary business, as previously discussed in the literature review, Chapter 2.

3.15.1 Cost Estimation Example

This example of cost estimation uses the procedure discussed in the literature review. We first determined the fixed and variable costs. We plotted them as shown in Figure 4. The hypothetical cost of guides is on the vertical y axis and the number of customers on the horizontal x axis. The total cost per number of customers is determined by the location of the variable cost line. When there are no customers, the total cost is

simply the fixed cost. As the number of customers grows, the total cost grows. This is due to the fact that the guides get paid based on the number of customers.

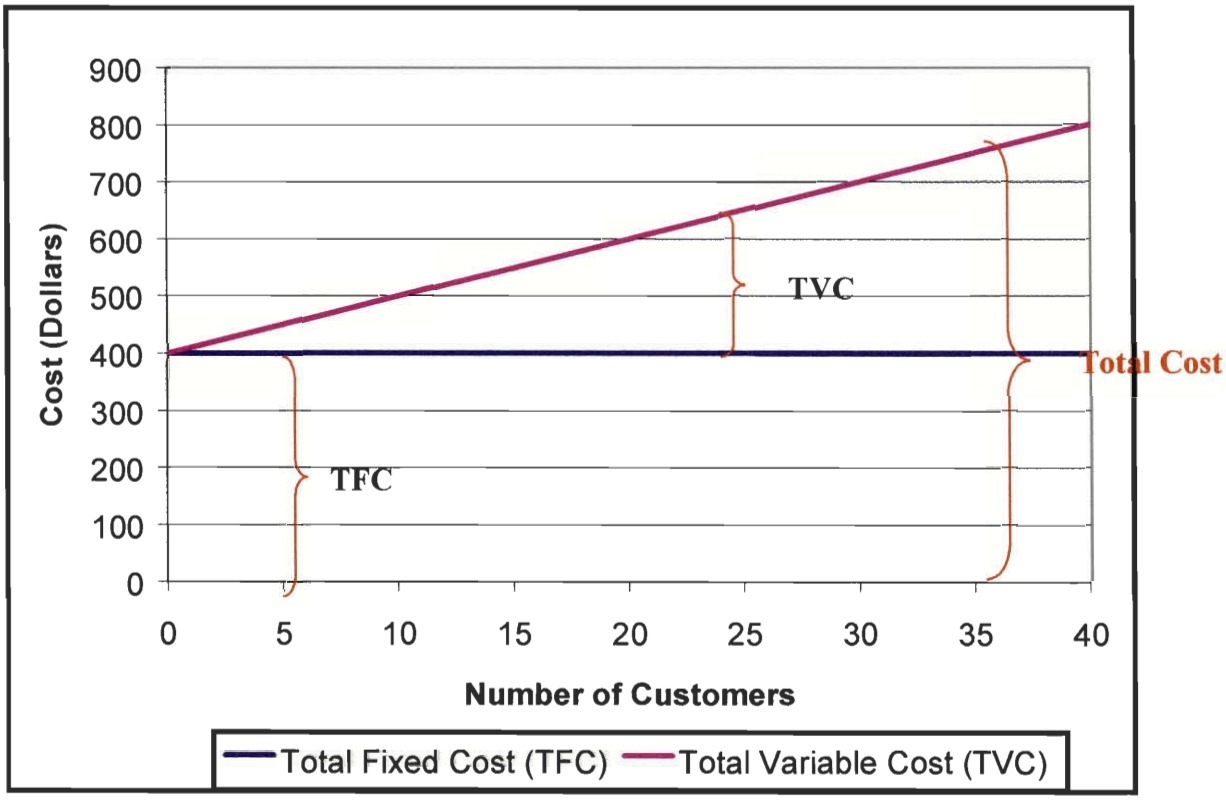


Figure 3-1. Graphical representation of Fixed and variable Costs for a Transportation Example

For example, when there are twenty customers, the total fixed cost (TFC) is still $400, but the amount paid to the bus drivers is increased. The guides in this example are paid $10 per patron. The graph above shows the total variable cost (TVC) to be $200 for twenty patrons. The total cost is therefore $600, the sum of TFC and TVC.

After the preliminary cost graph was made, we added a line indicating revenue. Revenue is the amount of money brought in by the service. In keeping with the tour example, the revenue is the amount collected from the customers. In this example, we will assume that

the price per customer is $30. By plotting the revenue vs. number of customers, a loss/ profit line is created. This can be seen in Figure 5. If the price per customers were $30, then ten customers would bring in $300. This is a loss because it does not cover the total costs. Forty customers would bring in $1200. This is a profit because it is greater than the total cost of operation. The break-even point is where the revenue and TVC lines intersect. Anything below this point is a loss, and anything above this point is a gain.

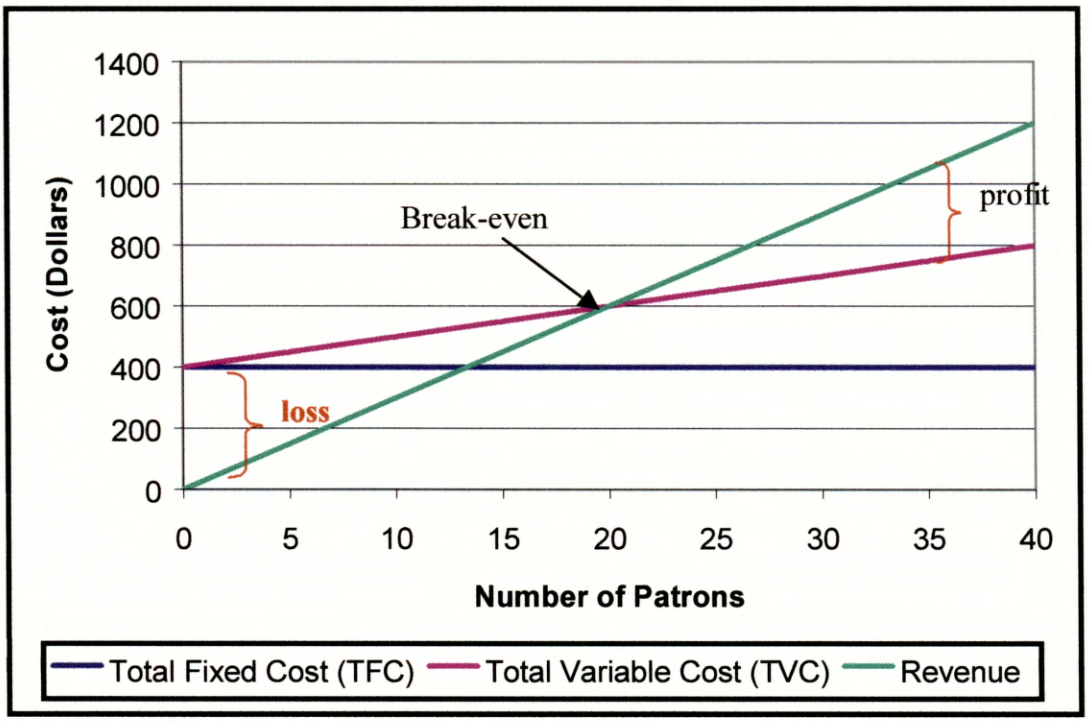


Figure 3-2. Graphical Representation of a Break-Even Point for a Transportation Example

We used these graphs to determine what adjustments need to be made. Our group discussed the probability of meeting the variable quota needed to break-even.

3.16 Formation of Alliances

In order to increase Lankester's recognition and build its research capabilities, we approached other organizations about forming alliances with the garden. The three organizations we approached were the Rainforest Aerial Tram Foundation, the Massachusetts Audubon Society and the biology department at Worcester Polytechnic Institute. The alliance between Lankester and the Rainforest Aerial tram could bring about collaboration on orchid research, educational programs and conferences. An alliance between Lankester Botanical Garden and the Massachusetts Audubon Society could result in comparative research of the flora and fauna of their respective regions, information exchange and travel opportunities. An alliance between Lankester Botanical Garden and WPI's biology department could aid research methods, species exchange, grant opportunities and student project opportunities.

4. Demographic Characteristics and Market Analysis

This chapter is devoted to the compilation and analysis of demographic information gathered by ICT and previous WPI project groups. The data that our group gathered during the course of our project is shown in Chapter 5, and its analysis is in Chapter 6. Although we did not collect the information in this chapter ourselves, the statistics and surveys provided by ICT and other groups provided us with a solid foundation for the development of a market segmentation and marketing strategy. These aspects of marketing are discussed in detail in the Literature Review.

4.1 ICT Tourism Statistical Report

To aid us in creating an accurate marketing segmentation, we examined ICT's *Tourism Statistical Yearly Report* for 1998. This report contains information on the numbers of tourists who arrived in Costa Rica during each month of 1998, their country of origin, and their port of entry. Many interesting trends emerge from these statistics. As shown in Figure 4-1, the total number of tourists to Costa Rica has increased for each of the last 9 years. In 1998, the total number of tourist arrivals reached 942,853, an increase of 131,363 from 1997.

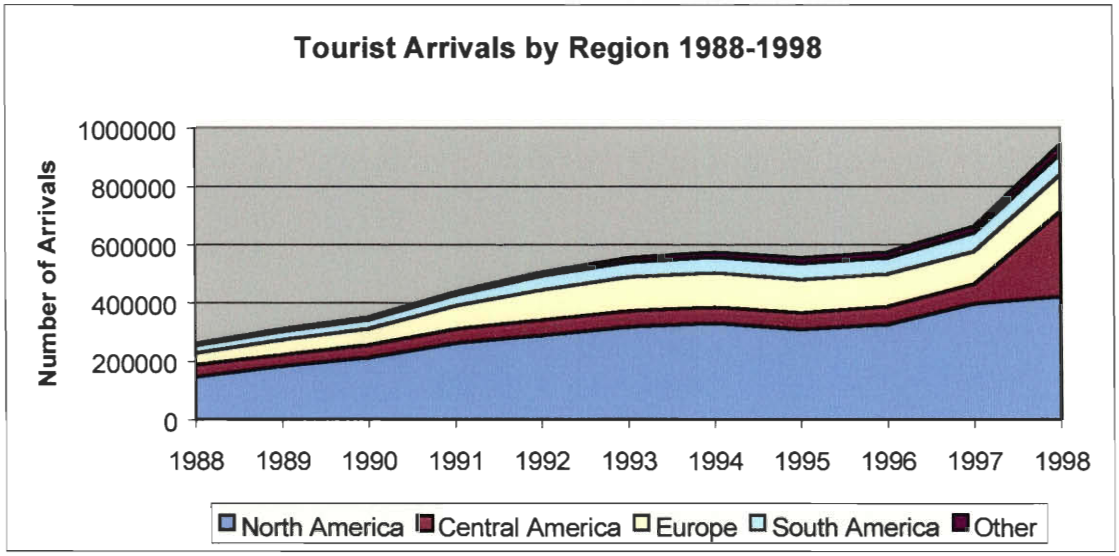


Figure 4-1. Tourist Arrivals to Costa Rica by Region 1988-1998

For an accurate market segmentation, an accurate assessment of what groups make up the total market is necessary. The Costa Rican tourist market is comprised of many nationalities. The report indicates how many tourists from each region arrived in Costa Rica in 1998. North America, including the United States, Canada, and Mexico, was the largest market, producing 419,648 tourists for Costa Rica in 1998. Central America was the second largest market with 293,810 tourist arrivals to Costa Rica. Europe, accounting for 127,491 tourists, was the third largest market. It is interesting to note that the United States alone accounted for 347,442 tourists, making it the single largest source of tourists to Costa Rica. Tourism from the United States also increased more quickly than in many years past, with a 21.8 percent increase between 1997 and 1998.

It must be noted that the sharp increase in Central American tourist arrivals from 1997 to 1998 is due to Nicaraguan tourists. Nicaragua produced only 10,023 tourists in 1997, but 170,059 tourists in 1998. This jump of over 160,000 in one year made

Nicaragua the second largest source of visitors reporting themselves as tourists to Costa Rica. This drastic change raises serious suspicions of the validity of those reports, although it is outside the focus of this project to analyze the political or economic situation in Nicaragua. The total number of international tourist arrivals to Costa Rica in 1998 is reported in Figure 4-2.

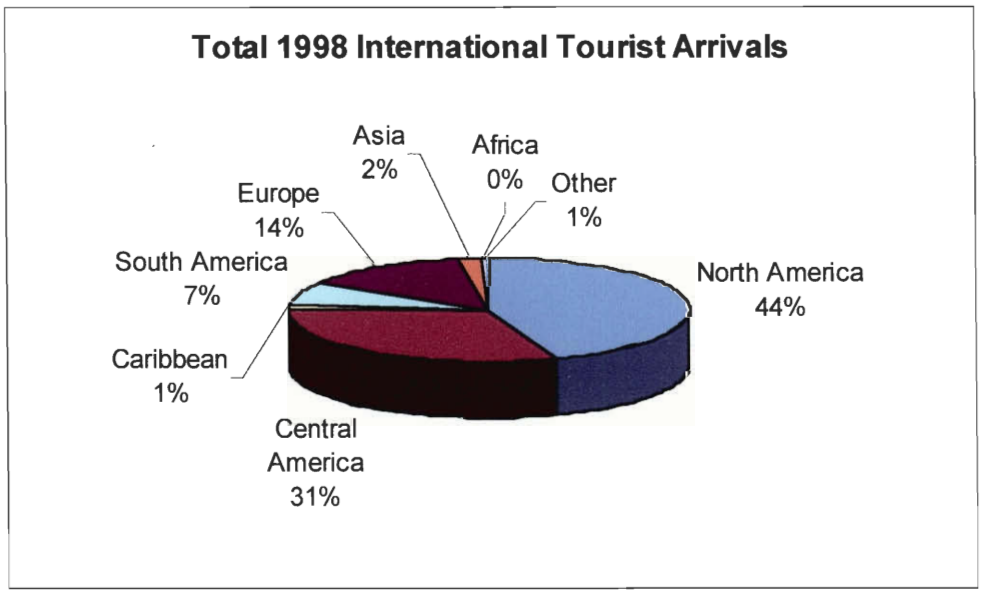


Figure 4-2. International Tourist Arrivals to Costa Rica in 1998

In Figure 4-2, we included Nicaraguan tourists in the Central American total, but due to suspicions about how many were actually illegal immigrants, they were excluded from the Central American total in Figure 4-3.

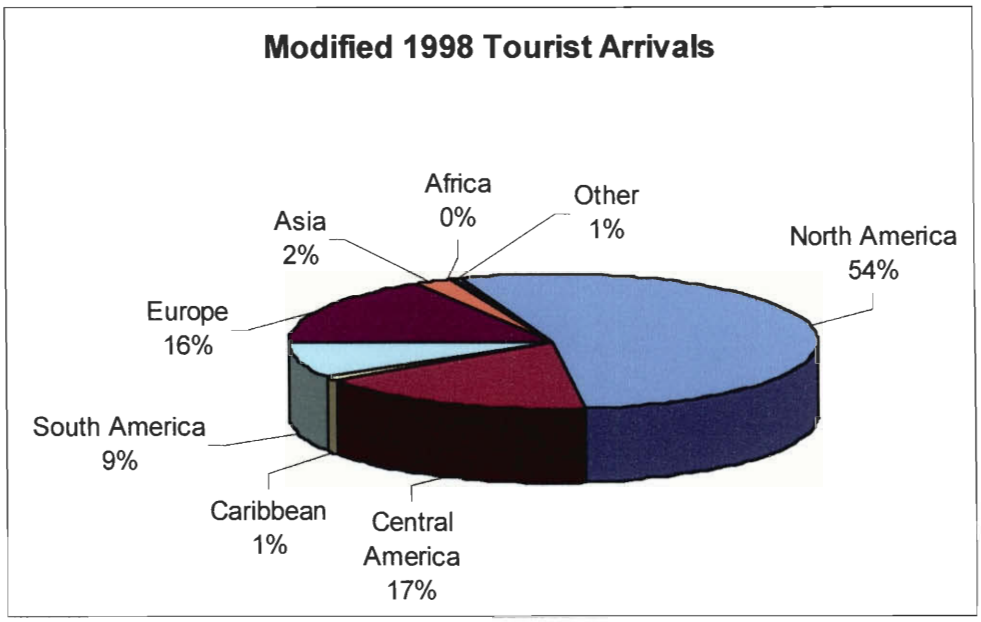


Figure 4-3. International Tourist Arrivals to Costa Rica in 1998 without Nicaragua

The ICT report also indicated seasonal trends in tourism to Costa Rica. Seasonal trends are an important consideration for a business plan. The trends reported by ICT differed somewhat between nationalities and markets. As Figure 4-4 shows, the high season for tourists from North America is December, January, February, and March, with a smaller peak in June and July.

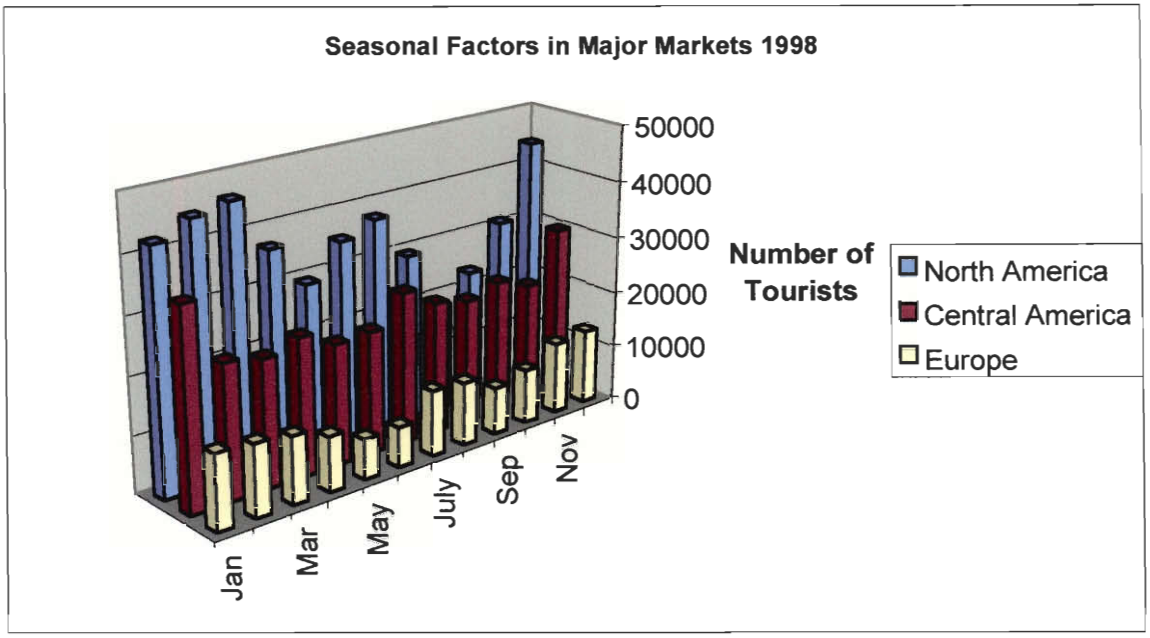


Figure 4-4. Seasonal Factors in Major Markets 1998

The rate of Central American tourist arrivals is more regular, with noticeable peaks only in December, January, and July. The high season for European tourists is remarkably similar to that of North America, with the largest peak from November to March, and a smaller peak in June and July. Although nothing in the report indicated why these seasons should be the most popular, the time from November to March corresponds to Costa Rica's summer.

The data also indicates that these trends do not only apply to 1998. Our analysis of the seasonal statistics as far back as 1992 reveals the same general pattern. Figure 4-5 shows that for the total number of incoming tourists, the high seasons are between December and March and between July and August.

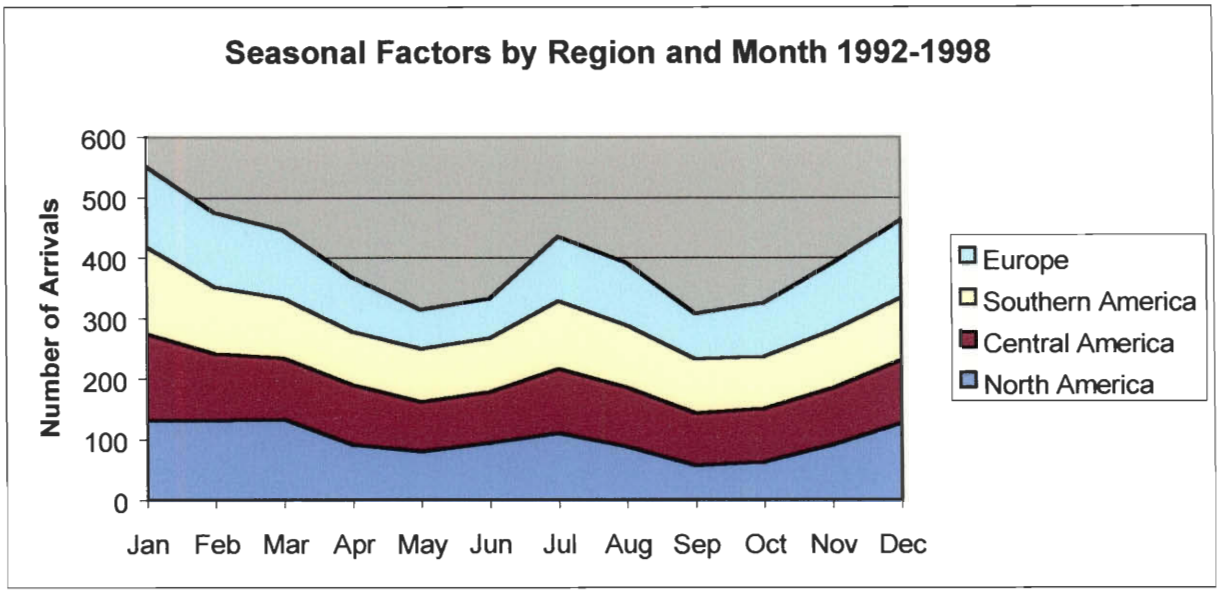


Figure 4-5. Seasonal Factors by Region and Month 1992-1998

One of the most interesting trends that emerge from ICT's statistical data revolves around where tourists enter the country. As Figure 4-6 indicates, of all tourists entering Costa Rica in 1998, 640,751 came in through Juan Santamaria International Airport. This indicates that most tourists to Costa Rica pass through a single location, an important trend to consider when marketing a tourist attraction.

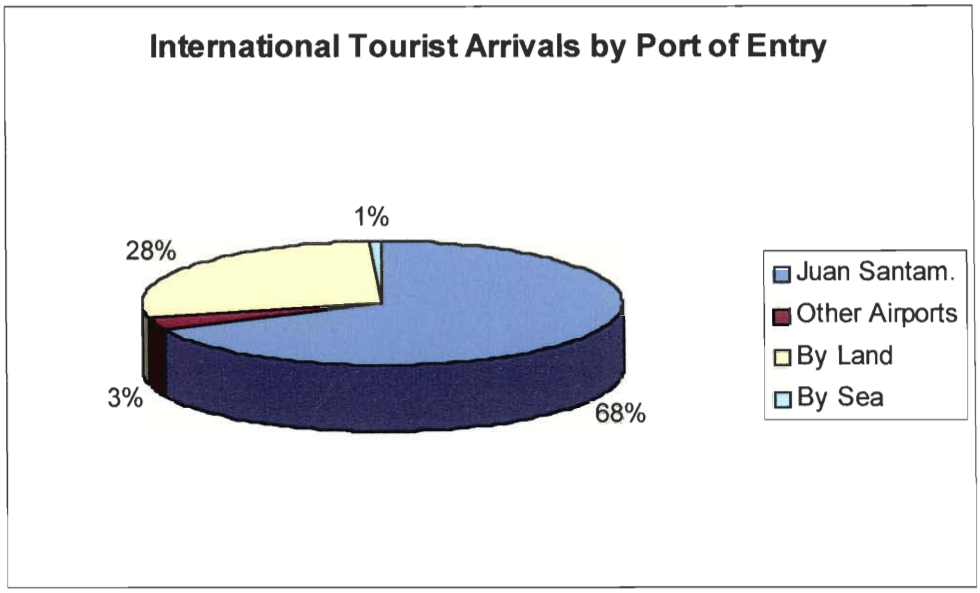


Figure 4-6. International Tourist Arrivals by Port of Entry

The only other significant method of entering the country was land-based travel, which accounted for more than 260,000 tourists. Central Americans accounted for 226,000 of the tourists entering the country by land. Only 271 Central Americans arrived by sea and 1090 more arrived at other airports. In 1998, 66,000 Central American tourists arrived at Juan Santamaria. Of the 293,810 Central American tourists who arrived in Costa Rica in 1998, more than half arrived by land arrived through Penas Blancas, a northwestern land port on the border with Nicaragua. This probably reflects the fact that Nicaragua accounted for 170,059 tourists in 1998.

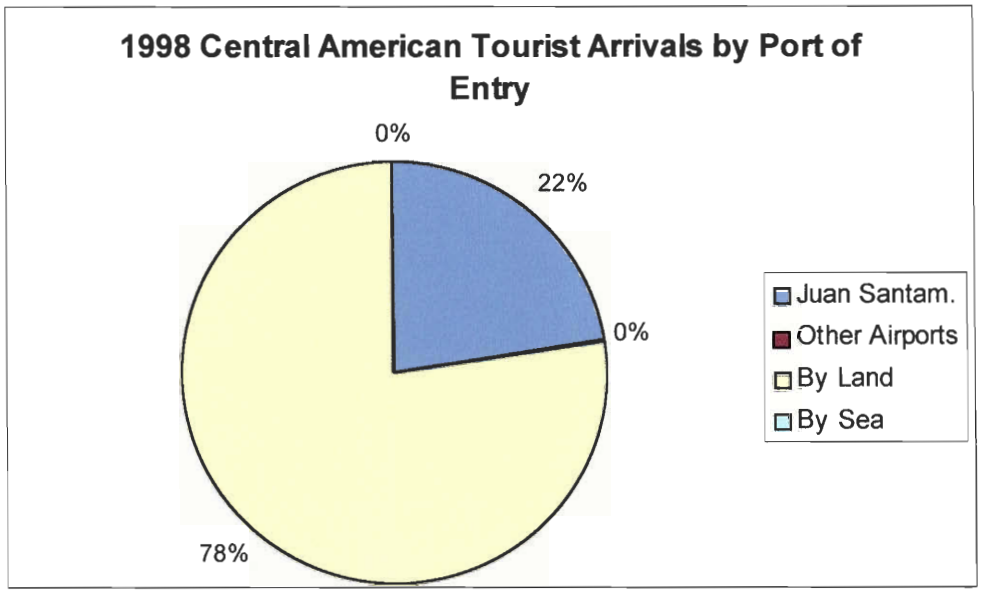


Figure 4-7. Central American Tourist Arrivals by Port of Entry 1998

One of the most significant trends that this report reveals is the tendency of North American tourists to arrive at Juan Santamaria International Airport. In 1998, 370,462 North American tourists landed at Juan Santamaria. Europeans also have a tendency to arrive at Juan Santamaria. In 1998, almost 88 percent of European tourists arrived at that airport.

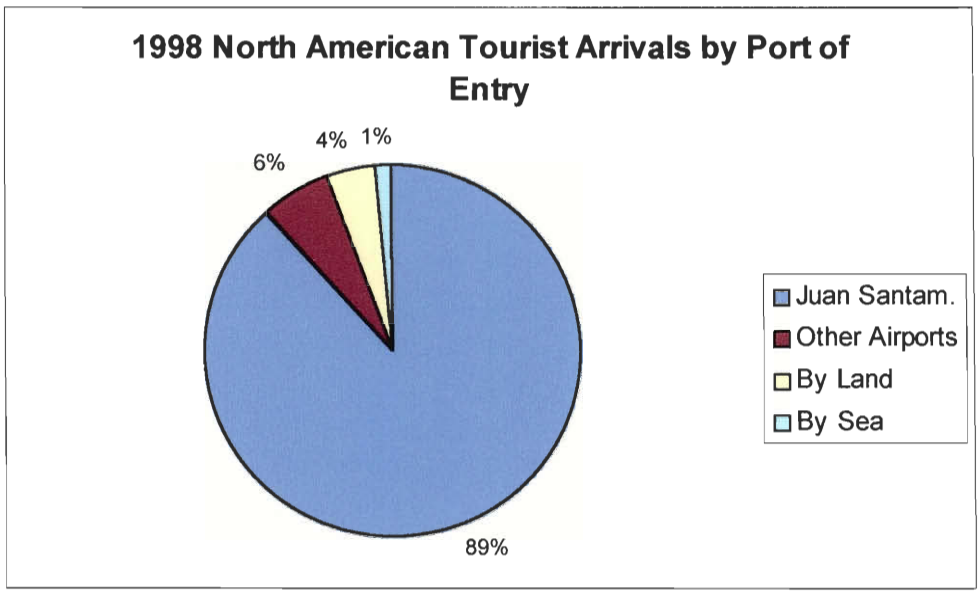


Figure 4-8. North American Tourist Arrivals by Port of Entry 1998

4.2 ICT Marketing Survey

Our group also examined another ICT publication, *Encuesta Aerea 1998*, which contains the results of a survey given to tourists by ICT in 1998. The survey results indicate tourists' participation in various activities in Costa Rica, where they stayed and for how long, how they decided to go to Costa Rica, and a variety of other information. The information in this report is very useful for market segmentation and the development of a marketing strategy. A number of interesting trends emerge from this information.

Figure 4-9 indicates the activities that were most popular with tourists to Costa Rica in 1998.

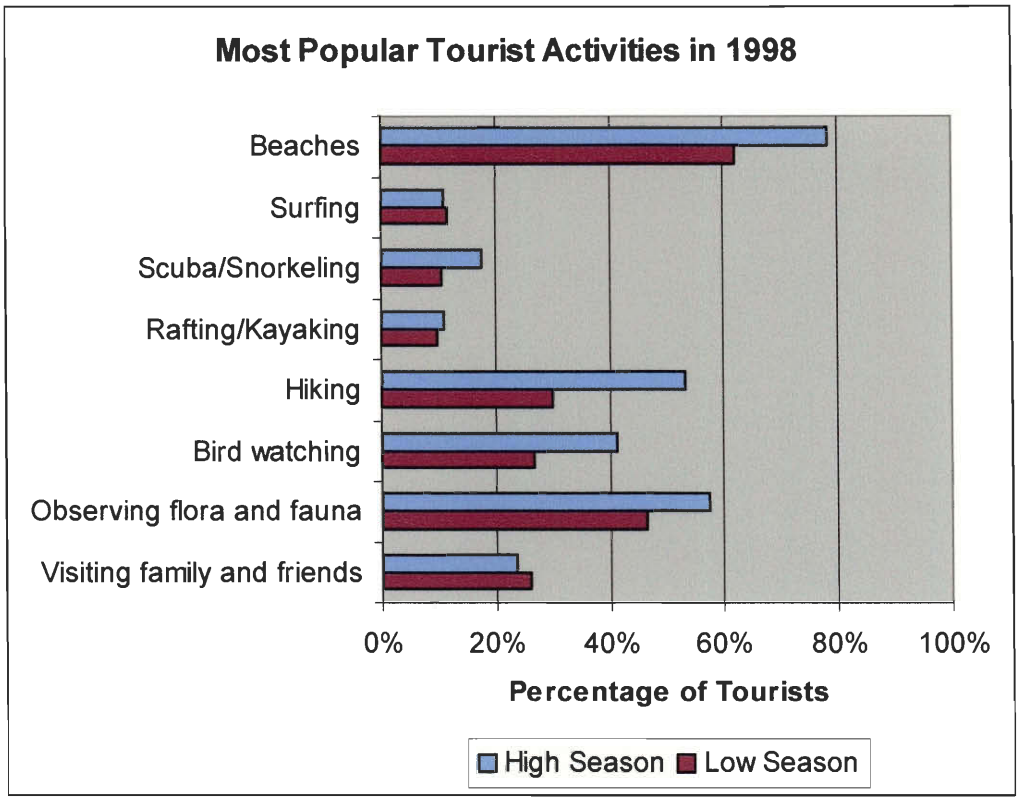


Figure 4-9. Most Popular Tourist Activities in 1998

Of all tourists visiting during the high season, 41.2 percent had gone bird watching during their stay in Costa Rica, and 57.4 percent had participated in activities surrounding the observation of flora and fauna. This is the segment of the tourist market that marketing for a bird watching program should focus on. During the low season, however, the numbers dropped to 26.9 percent for bird watching and 46.5 percent for the observation of flora and fauna.

Figure 4-10 reveals activities popular with tourists of certain nationalities.

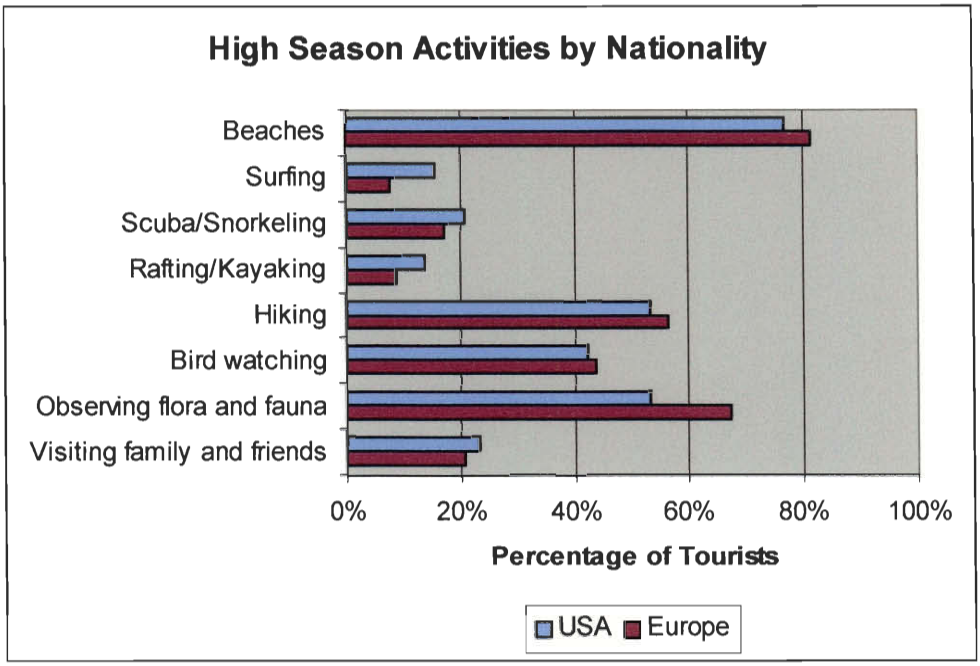


Figure 4-10. High Season Activities by Nationality

Tourists from the United States had an average participation rate for bird watching and observation of flora and fauna. While 41.2 percent of all tourists went bird watching, 42.1 percent of tourists from the U.S. participated in that activity. European tourists showed a similar interest in bird watching with a 43.8 percent participation rate. Tourists from Europe had an above average interest in the observation of flora and fauna with a participation rate of 67.2 percent, comparing to U.S. tourists' rate of 53.2 percent and the average rate of 57.4 percent. These numbers show that tourists from the United States and Europe should both be targeted by a marketing campaign for a bird watching program.

Of special interest to those marketing a tourist attraction, the ICT survey also discovered what factors influenced tourists' decisions to choose Costa Rica for their vacations. This information is displayed in Figure 4-11.

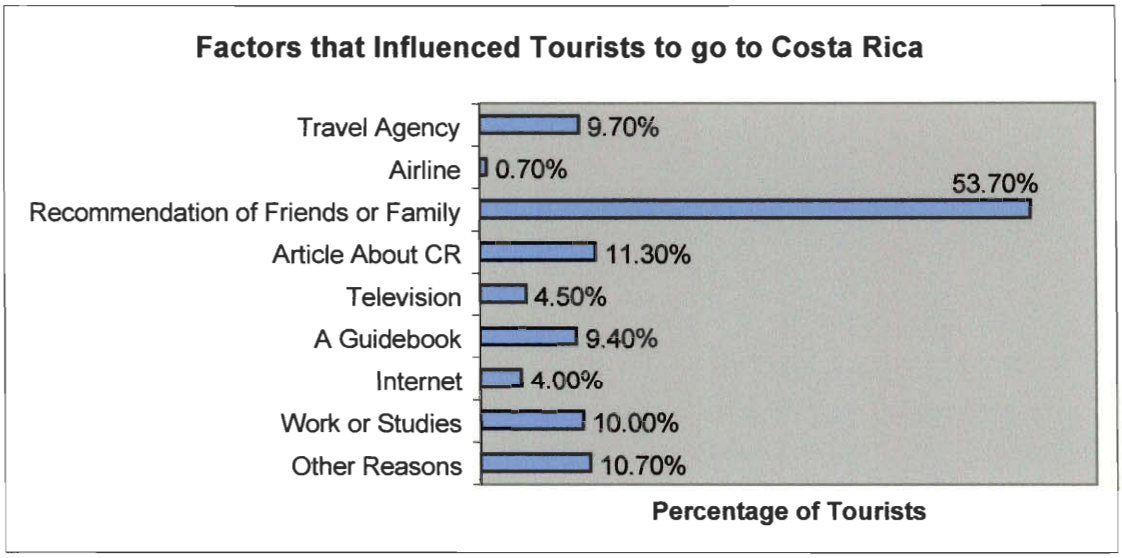


Figure 4-11. Factors that Influenced Tourists to go to Costa Rica

The surprising element here is that 53.7 percent of tourists indicated that a recommendation from a friend or family member was one of their primary influences. The next largest influences, each at about 10 percent, were travel agencies, guidebooks, and work or study reasons. The Internet and television programs or advertising each influenced less than 5 percent of tourists in 1998.

The ICT survey results could also indicate if tourists from a certain country are more responsive to certain influences than another, although this is probably not the case. As Figure 4-12 shows, the United States, Europe and Canada seem have the same proportions of influences.

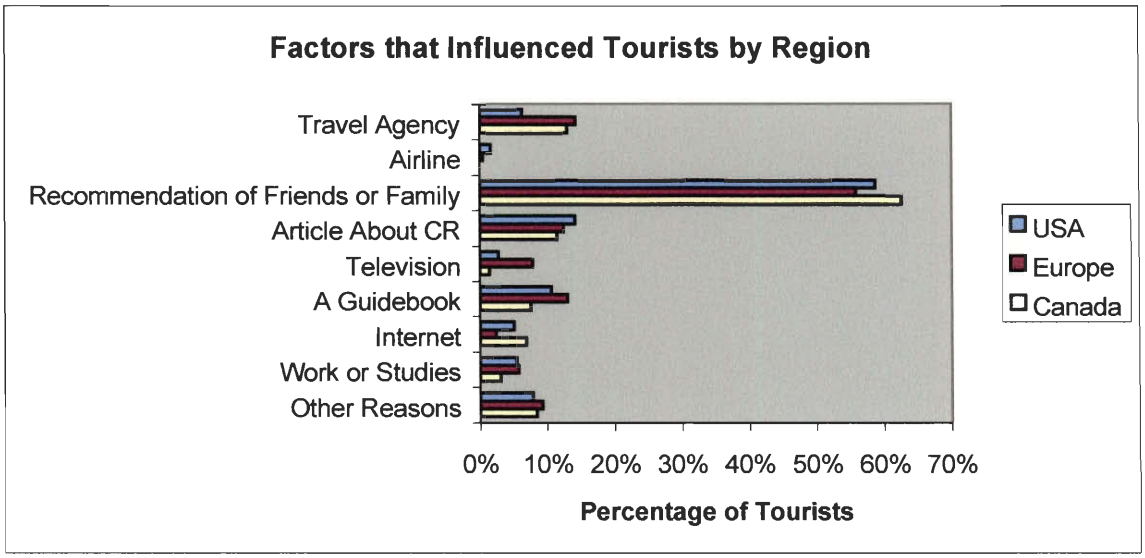


Figure 4-12. Factors that Influenced Tourists by Region

Tourists from the United States are slightly less influenced by travel agencies, guidebooks, and television. Although the Internet is less influential in Europe, television has a greater influence. These differences are small enough to be ignored, however.

The survey results also indicate where tourists stayed and for how long. This is important information for the development of a marketing strategy. Figure 4-13 shows the percentage of tourists to Costa Rica who stayed in the central valley area for at least one night.

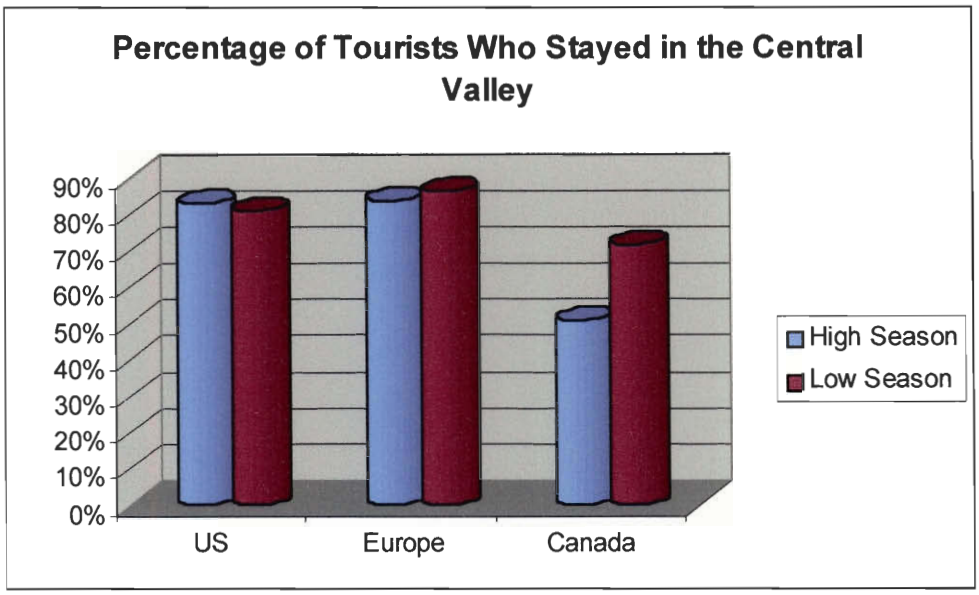


Figure 4-13. Percentage of Tourists Who Spent at least One Night in the Central Valley

About 90 percent of tourists from the United States and Europe spent at least one night in the central valley area. Canadians were less likely to stay in the central valley.

As Figure 4-14 indicates, the average high-season stay in the central valley was 5.7 nights for both European tourists and those from the United States. During the low-season, this number decreases.

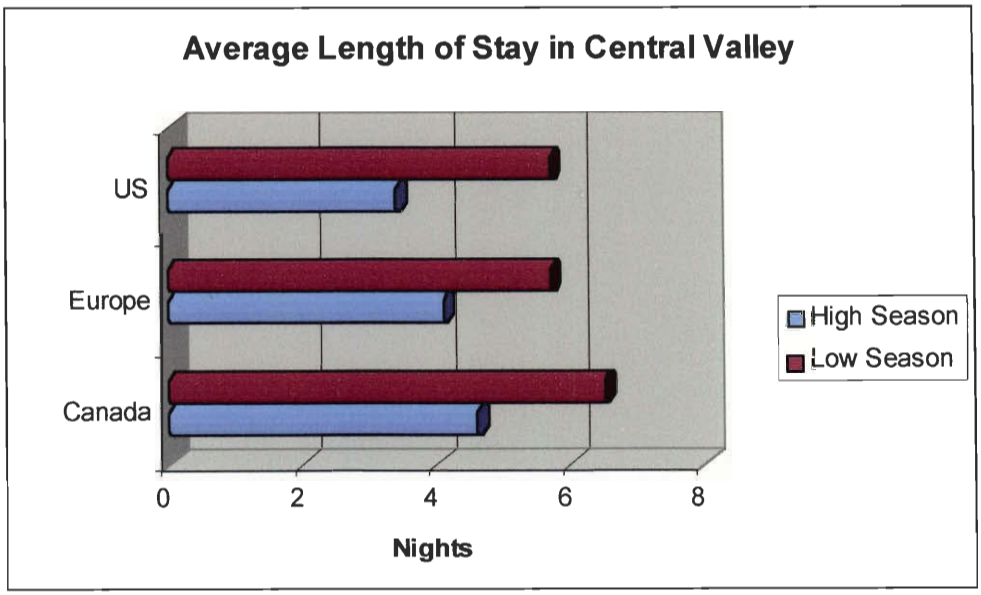


Figure 4-14. Average Length of Stay in Central Valley Area

As the ICT report demonstrated, a large number of tourists stay in the central valley area for at least four days. This group of tourists will be geographically close to Lankester by virtue of their stay in the central valley, and are more likely to be enticed by the prospect of a half-day tour at the garden.

4.3 Marketing

In order to market a tourist attraction, an understanding of the potential customers, their needs, and their expectations is necessary. The development of accurate market segmentation is an important tool to gain this knowledge. With this information, an efficient marketing strategy can be designed and implemented targeting these specific groups.

4.3.1 Market Segmentation

The purpose of a market segmentation is the separation of the total market into smaller groups with similar needs or other similarities, so that a specific marketing strategy can be used for some or all of these segments. An ideal market segmentation would result in the division of the total market so that the members of given subgroups respond the same way to various marketing programs. By examining the data gathered from the ICT reports and previous IQP's, we created a market segmentation for a bird watching program at Lankester Botanical Garden.

To gain an understanding of what people would be interested in Lankester, we examined a survey conducted at Lankester by another WPI group in 1998. The survey was given to visitors to the garden over a period of five days in June of 1998. The survey indicates that the garden's two main categories of visitors are foreign tourists and students of the University of Costa Rica.

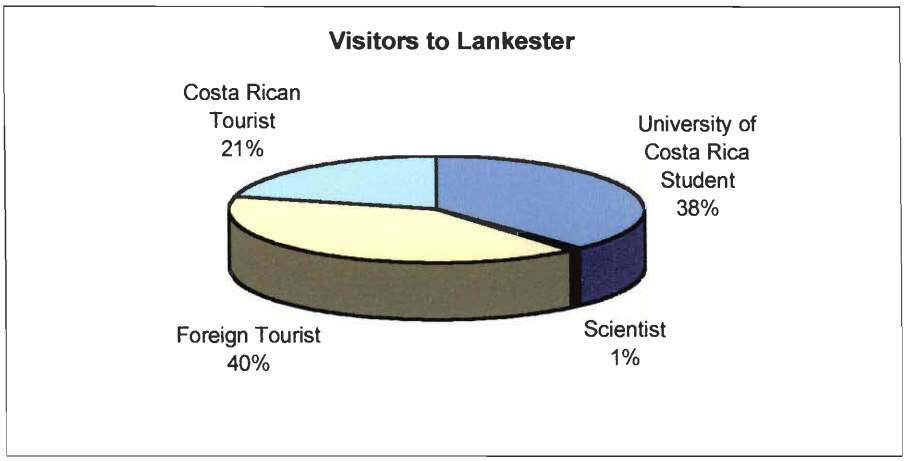


Figure 4-15. Visitors to Lankester Botanical Garden over 5 days in June, 1998

It is interesting to note (Figure 4-16) that only 52 percent of these visitors attributed their visits to Lankester to recreation. Although 38 percent of visitors were University of

Costa Rica students, most of these students were visiting the garden for research or for a school trip.

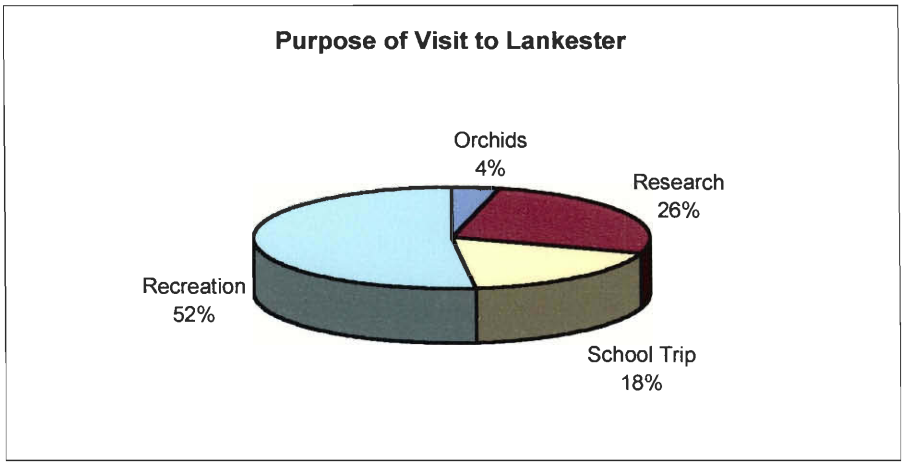


Figure 4-16. Purpose of Visit to Lankester 1998

This information indicates a division in visitors to the garden. More than half of the visitors were interested in enjoying nature, and the rest were in pursuit of a more educational experience. This is an important division to consider, because these two groups gather information about Lankester from different sources, and are influenced by different types of advertising. Tourists interested in recreation might be attracted by a colorful brochure in the lobby of their hotel, where students interested in an educational experience might be more influenced by an informative flier at their school. The student market may also be reached by promoting Lankester to the school as a site for field trips or research.

From this survey, we know that foreign tourists are an important section of all visitors to the garden. The ICT publication, *Tourism Statistical Yearly Report,* for 1998 indicates that North America is the largest source of tourists to Costa Rica, Central America is the second largest, and Europe is the third. The number of tourists originating

from other regions is small enough to be ignored by this segmentation. Central American tourists exhibit some differences from European and North America tourists. While the vast majority of North American and European tourists arrive by air, most Central American tourists arrive by land. Most tourists from countries in Central America other than Nicaragua arrive by air.

If we were planning to advertise in other countries, we could consider Central American, European, and North American tourists as significantly different segments of the market. Because the scope of the marketing campaign will be limited to Costa Rica, we can consider tourists from these regions as one group. This is useful, as all foreign tourists share common behaviors within Costa Rica. Most of them will stay in hotels, read guidebooks, get information from tourist agencies, or pick up promotional brochures. The set of international tourists can be divided in to two smaller groups, those interested in an educational experience, and those simply interested in viewing nature. This distinction is also useful, as these two groups must be contacted in different ways.

We can hardly ignore the fact that tourists from the United States comprise the largest section of the market, however. The option of free publicity from U.S. nature magazines, mentioned by Terry Pratt, the marketing director of Horizontes, should be seriously considered. This press-release style advertising would reach a section of the market already interested in bird watching and educational experiences, but who may not have decided to go to Costa Rica yet.

Although the most important segment of the market consists of foreign tourists, the group of Costa Rican visitors is also important. This group is slightly smaller, and may be less interested in a tourist-oriented bird watching program. They may be more

likely to become regular visitors to the garden. Because of this, the set of Costa Ricans, including students of the University of Costa Rica, should be considered the secondary market segment.

4.3.2 Marketing Strategy

Once we determined that foreign tourists comprised the primary target market, we examined the merit of several promotional strategies focused at this group. Foreign tourists visiting Costa Rica all share certain common features, especially location. Although tourists may come from all over the world, once they reach Cost a Rica, most of them will stay in hotels, arrive at Juan Santamaria Airport, investigate a tour agency, or study at a language school. We knew that more than 40 percent of these tourists are interested in bird watching, for either educational or recreational reasons. Our marketing strategy encompasses several different methods of reaching this audience, both in Costa Rica and in their countries of origin.

The ICT survey indicated that more than 50 percent of foreign tourists were influenced by the recommendations of friends and family. Other than making the bird watching experience at Lankester as positive as possible, we cannot directly utilize this channel of promotion. The other main sources of influence were articles and guidebooks, which influenced about 10 percent of tourists, and television and the Internet, which affected about 5 percent of tourists. Other than "word of mouth," these are the most effective means of influencing tourists outside of Costa Rica. While television advertising is far too expensive for an organization on a limited budget, the other three options, articles, guidebooks, and the Internet, are free.

Articles are a free and effective method of reaching a segment of the market interested in bird watching. As we indicated earlier, Terry Pratt, the marketing director at Horizontes, enthusiastically advocated sending press releases to U.S. magazines for bird watchers. To maximize the effect of our marketing strategy, we wanted to focus on those foreign tourists who are interested in bird watching as much as possible. Articles published in magazines devoted to bird watching are a free and effective method of reaching this audience.

The Internet is another free method of informing an international audience about a bird watching experience in Costa Rica. Although only 5 percent of foreign tourists said that the Internet was a major influence in their decision to go to Costa Rica, the Internet can also be an invaluable means of dispensing information. Thus, the creation of a web site for Lankester Botanical Garden can help fulfill two goals of this project: the promotion of a bird watching program, and the improvement of Lankester's environmental education facilities.

Although guidebooks are very influential to foreign tourists, most are updated only every two years. All three popular guidebooks we used, *Lonely Planet*, *Fodor's*, and *The New Guide to Costa Rica* published their latest edition this year. Our group decided that letters should be submitted to these guidebooks describing any new program as soon as possible, even though that information may not be published until 2002.

Our group devised a way of partially circumventing the problem of infrequently updated guidebooks, by using these major guidebooks to compile a list of hotels. Most of these hotels attributed the majority of their customers to guidebooks. All of these hotels expressed an interest in displaying pamphlets from Lankester Garden. By placing

pamphlets in these hotels, we can reach the group of tourists who use the guidebooks to locate hotels.

The ICT Statistical Report also indicated that the vast majority of foreign tourists arrived at Juan Santamaria International Airport, outside of San Jose. Our group investigated the international arrivals terminal and discovered that all incoming visitors to Costa Rica must walk by an ICT tourist information desk, which is the only source for pamphlets in the terminal. ICT agreed to allow Lankester Gardens pamphlets to be prominently displayed there for free. Of all the pamphlet locations surveyed, this seems the most promising, as more than 600,000 tourists pass by that desk every year. If 40 percent of those tourists are interested in bird watching, and another 90 percent of those are staying in the Central Valley for an average of four days, that means that pamphlets placed in the airport have access to more than 210,000 tourists who are interested in bird watching and will have an opportunity to spend a morning at Lankester.

The secondary market segment, comprised of Costa Ricans and students of the University of Costa Rica, requires a different marketing strategy. Pamphlets placed at the airport or in hotels will not reach potential clients who live in the San Jose area. Advertising on the University radio station and on popular commercial radio stations is a more effective method of marketing to this group.

5. Results

In analyzing the data by the means discussed in our Methodology, we developed recommendations for our watching program and determined its specific costs.

5.1 Ecological and Environmental Education in Costa Rica

Through interviews with experts, discussed below, we have determined that ecological and environmental education is a very large part of Costa Rican life. Many efforts are currently focused on improving ecological education for residents and tourists.

5.1.1 Interview at OTS

Through our meeting with Yolanda Elliot and Sylvia Alvarado, employees at OTS, we have determined that there is a large market for and focus on ecological education in Costa Rica. These women and Vilma Castillo, the director of environmental education at the Asesora Nacional de Educacion, were able to let us know about several problems and efforts involving Costa Rica's environment.

Castillo told us the major themes of environmental education in Costa Rica today. They are the protection of water, the study of river systems, trash disposal, organic and nature friendly agriculture, and wildlife. She says that the major environmental problems of today are deforestation, environmental contamination, fires, pollution, erosion, harmful chemicals in agriculture, and the hunting of animals.

According to Elliot and Alvarado, there are many ecological education efforts in Costa Rica today. One effort for clean beaches incorporates an award system. Blue flags

are placed on the cleanest beaches to indicate their environmental friendliness. Beaches in the Central and South Pacific areas have been most highly recognized.

Elliot says that people are attracted to Costa Rica by its ecological concern. Another way of attracting tourists is through Sustainable Tourism Certification. This is a certification used for places of lodging to promote their support of sustainable tourism. There are also some recycling programs throughout the country.

Castillo feels that Lankester Botanical Garden promotes environmental education by providing educational programs for both students and teachers. Bird watching, Alvarado says, is a form of ecological education in that it makes people aware of natural diversity. Such awareness, she adds, allows for increased conservation efforts. They feel that giving tourists information on the diversity of Costa Rica, endangered species and what they can see in Lankester Botanical Garden is a good form of ecological education.

5.2 Ecological Education at Lankester

Lankester Botanical Garden offers a wide range of educational field courses. They offer multiple courses that teach about birds. There are general courses about the birds and butterflies of Costa Rica as wells as more specific programs. These include programs on the diurnal and nocturnal birds of Monteverde, Bosque Seco, Bosque Lluvioso, Cano Negro and Arenal. Beyond bird programs, the garden offers courses on the trees of the Central Valley, Central pacific, Bosque Seco and Caribe. Other botanical courses include those on medicinal plants and palm trees. The garden offers a course in which the cultivation, identification and conservation of orchids is taught. There are also courses in nature photography.

5.3 Lankester's Current Resources

The current resources of Lankester Botanical Garden were examined visually. We felt this was necessary in order to determine resources the garden already contains. Due to low funds any facilities or equipment that the garden does not need to purchase could be very beneficial. We cataloged all of the following resources: buildings, personnel, facilities, exhibits, and equipment. Lankester Botanical Garden contains a total of thirty buildings and structures. Equipment that could be used for bird watching program was not found (telescopes, binoculars, etc.).

The garden contains three main areas. The largest area within the garden is the main entrance area. The other two areas are the interior garden area and the area in the rear of the garden.

The main entrance area contains the majority of the buildings in the garden. The main building itself contains a gift shop, a classroom, and two offices. The gift shop contains multiple different gift items and books. In the reception area of the gift shop there is one fax machine, two phones, and one cash register. The classroom contains two computers, one printer, twenty-nine desks, two slide projectors, one blackboard, two whiteboards, two overhead projectors, one projector screen, and two display cases. Also found within the main building are two private phones, one public phone, and one safe. In addition to the main building there is a security post, a parking lot, three bathroom areas, one multipurpose staff building, two greenhouses, one maintenance building, and one picnic area. The multipurpose staff building contains a kitchen, tables and chairs. The picnic area contains fifteen tables. Of these, twelve are small tables and three of them are large tables. In addition there is a living area and a garage.

In the interior part of the garden there are several buildings. There are two greenhouses in the interior and three maintenance buildings. Also there are two covered rest areas within the garden. The interior of the garden has nine benches and eleven trash cans. Also there are two exhibit cases in the garden, one solely in Spanish and one that is bilingual.

The remaining area of the garden located in the rear contains three structures. The first structure is a personal living area occupied by one of the garden's employees. The second structure is a greenhouse that is not currently functional. The last item contained within this area of the garden is the butterfly garden.

5.4 Bird Watching Information

In order to create a bird watching program that is both feasible and enjoyable, our group used the information gathered from the interviews with Julio Sanchez, a well known Cost Rican ornithologist, Jaime Aguilar of Lankester Botanical Garden, and Terry Pratt, the marketing director at Horizontes Nature Tours. The information that they gave us was useful to creating program specifics and marketing strategies. The full interviews with these experts can be found in Appendix B.

5.4.1 Bird Watching at Lankester Botanical Garden

Sanchez and Aguilar both feel that Lankester Botanical garden is a good place for bird watching. Sanchez says that there are over one hundred species of birds at Lankester. The complete list of birds that can be seen at Lankester Garden can be found in Appendix F. The Central Valley is a good place for bird watching, Aguilar says, because urban regions have many houses and people, making it difficult to see birds.

Sanchez points out that some of the species that can be seen at the garden should not be. Why they are found there cannot be explained, because the area is small and surrounded by coffee plantations. It does not seem reasonable to him that three tropical species, the Scaled Antpitta, the White Bellied Wood Wren and the Collared Trogon, would be found at Lankester Garden. These three species live specifically in primary growth forests. The Sedge Wren can be found in Cartago due to its wet pastures. It has probably been to Lankester Botanical Garden. This is also unusual because, elsewhere, it is only found in Canada and Argentina. This presence of unusual species is an attraction for those who are interested in seeing specific Costa Rican birds.

We heard theories from multiple sources who tried to explain why these species are found at Lankester Botanical Garden instead of in the primary forest. Sanchez has discussed this topic with several people, including F. Gary Stiles, the coauthor of *A Guide to the Birds of Costa Rica*, and no definite theory can be decided upon. He says that it is not the size of the garden nor the plants that attract these birds. Sanchez feels that perhaps these species have been driven here due to the deforestation of their primary forest homes. Rafael Elizonbo, a guide at the Sky Walk in Monteverde has a theory similar to that of Sanchez. Elizonbo says that perhaps the Collared Trogon is found in the garden because of the coffee plantations that surround it. He says that this kind of bird eats many insects found in coffee plantations have many grasshoppers and crickets. Elizonbo says that between the garden and the plantations, the birds have a good habitat and good food.

5.4.2 Bird Watching Organizations

Both Aguilar and Pratt were able to give us insight into the activities and uses of birding organizations in Costa Rica and the United States. Aguilar is aware of two birding organizations in Costa Rica. These organizations are the Association Costarricense and the Club de Pajaros Norte Americanos. Though he is not a member of either of these organizations, he knows people in these organizations and participates in some of their activities. Each year, the Association Costarricense has a meeting at Lankester Botanical Garden. Aguilar also takes part in the yearly census of species put on by the Association. He is acquainted with the president of the Club de Pajaros Norte Americanos, Richard Rodriguez, and attends meetings for this group.

Pratt feels that birding organizations are key to the running and marketing of a bird watching program. She says that these organizations could be useful for finding interested guides and finding out a good form for interviewing guides. These organizations can be used for marketing, as well. Pratt recommends bird chats online, the American Birding Association, Bird Watcher's Digest and the Specialty Travel Index. The latter of these groups is more expensive and must be contacted directly. The American Birder's Association can be alerted to the program by a press release. Press releases, she says, can be a very important source of free marketing. The international market for our Lankester program, Pratt points out, should include the North American Birding Club, schools, and ornithology classes.

5.4.3 Bird watching Guides

Sanchez and Aguilar were able to give us ideas and information regarding the education, training, payment and hiring of bird watching guides.

Sanchez feels that while some serious companies want employees with a degree in biology for their bird watching guides, small companies are more interested in having guides who simply know about the birds of the area. Aguilar points out that being bilingual is a necessary skill of a bird guide. He feels that it is important for guides in Costa Rica to be able to speak English.

Sanchez has indicated that there are places in Costa Rica for guides to receive training. Classes in English, natural history and ornithology can be taken at the INA in San Jose. These classes are free to those who are guides. There are also courses offered at Lankester Botanical Garden that, Aguilar feels, would provide a minimum background for a bird watching guide. He says that Lankester offers basic bird courses, taught by Julio Sanchez. There are also talks offered once a month. Many people, he says, work as guides after taking courses at Lankester. There are also formal speeches and tours offered on specific bird species. These are presented for small groups of sixteen to twenty people.

The salary of a bird watching guide, says Sanchez. depends on the guide. Some make $65 to $100 for a whole day program. Most guides earn less than $100 a day. He says that there are only about five guides in Costa Rica that make more than $100 a day. Guides with a degree in biology make more money than those who do not.

Sanchez believes that seasonal guide hiring would be best for Lankester Garden's bird watching program because the number of tourists varies greatly by season. Aguilar feels that it is important to have an ornithologist employed year round for bird watching programs, but he agrees that during the best time for bird watching, it is important to have more guides. This prime time for bird watching at Lankester Botanical garden is from

October to May because of bird migration. However, this time range is not consistent for all species. Also, some species are more interesting to observe in one season rather than another due to their differing mating seasons.

Aguilar says that, for a large group, the optimum number of people per bird watching guide is fifteen. He does add, however, that a good bird watching group can have two people and that the maximum number is twenty.

There are three to five people that Aguilar is aware of that would be willing to work at the garden as bird watching guides. These guides, he asserts, are good, serious, and interested guides. These guides are generally busy for periods of time; he feels that they could be available as needed. Aguilar feels that because these guides are professionals, they would need to be paid approximately $50 dollars a day. He does point out, however, that this is not a fixed amount.

5.4.4 Structure and Content of a Bird Watching Program

Sanchez has been involved with many natural history and birding programs in Costa Rica. He says that there are different levels of bird watching programs. He feels that a beginner program would best suit Lankester Garden. This is because the garden is not primary forest, where birds are best seen. Lankester has over one hundred sixty-five species of birds and therefore can offer an overview to the birds of the Central Valley. A checklist for birds would be good for the program as people enjoy using them. He also thinks that the Lankester bird watching program would work best as an introductory program to the natural history and birds of Costa Rica. Sanchez says that the majority of the tourists will be interested in more than just the birds. They will be interested, he says, in the natural history of Costa Rica as well as the orchids in the garden.

Pratt agrees with many of Sanchez's ideas. She feels that it is not enough to just take people to look at birds. It is important, she says, to have a script for the tour. She also suggests a printed checklist of birds for the program, perhaps printed on recycled, banana, coffee or sugarcane paper. Pratt indicates that an informational packet for the tourists would not only be educational but also add to the value of the program. This packet could include information on life zones, species in those zones and the history of Lankester Garden. Another suggestion that Pratt has is to include another area location in the tour. She suggests the Basilica de Nuestra Senora de Los Angeles, the cathedral in Cartago. She says that tourists will be willing to purchase souvenirs from the garden. These could include a CD of bird songs at Lankester Garden and photos of the birds.

5.5.5 Bird Watching Equipment

Aguilar says that it is often typical of a bird watching facility to provide birding equipment. He says that those who study birds usually have their own equipment, but those who simply watch birds do not. As for equipment at Lankester, Aguilar says that an optical company, Swarovski, has offered rental of binoculars to the garden. The company is represented in Costa Rica, and it may be considered when the bird watching program is put in place at Lankester.

We discussed the acquisition of bird watching equipment with Sanchez. This equipment includes specifically binoculars and other sighting scopes. He says that it is difficult to get birding equipment in Costa Rica and that collection in the United States is a good idea. It is possible, he says, to collect used equipment from birders. This is carried out through articles in birding periodicals. He has been involved in the collection

of equipment from the United States in the past, he says. It is important to get used equipment that is still in good condition.

Our group looked into a program that is run by the Manomet Center for Conservational Sciences in Manomet, Massachusetts. This program, called The Birders' Exchange, is a joint program with the American Birding Association. The Birders' Exchange organizes the collection of donated birding equipment, including binoculars, scopes, field gear and books, for distribution to Latin America and the Caribbean. The application for this program can be found in Appendix I.

5.5.6 Suggestions for Improvements to the Garden

Sanchez has several suggestions for Lankester Botanical Garden in order to improve its bird watching capability. He feels that the southwest area of the garden would be a good place for a pond that would attract birds. Also, planting specific types of trees and flowers and setting up nectar, fruit and seed feeders would attract more birds. Specifically, the plant Stachytarpeta jamaicensis can attract hummingbirds. A complete list of plants that improve the attraction birds can be found in Appendix E.

If possible, says Sanchez, it would be an asset to use the marshland adjoining the garden for bird watching purposes. Different species can be seen in this area than in the garden.

5.5.7 Other Marketing Concerns for a Bird Watching Program

There are other areas, Pratt says, that need attention when starting a new program. The product must be registered, entrance tickets must be made, and legal invoices for tourist agencies created. There will need to be someone at the garden who works

specifically to handle these issues and to take reservations. When agencies are involved, she says, they make a minimum 25 percent commission on tours. This fact must be considered when pricing the program.

5.5.8 Cost Information

By calling hotels in Costa Rica, we examined costs for bird watching tours. The costs in Table 1 are for bird watching tours with a guide and do not include transportation. The cost and the duration of the tour are listed for some popular areas of the country.

Table 5-1. Costs for Bird Watching Tours

Location	Price (per person)	Duration (hours)
Monteverde	$15	2.5
	$39	1/2 day
	$15	3
La Fortuna	$15	3
Montezuma	$15	2
Manuel Antonio	$45	1/2 day
	$40	3
	$35	4
Limon	$30	3.5

Cosmos Tours in San Pedro has a bird watching program that runs to Cartago. This tourist agency charges $65 for the program for a maximum of five people and $90 for transportation for a maximum of five people.

5.6 Case Study: INBioparque, San Jose, Costa Rica

The following information was gathered on a trip to INBioparque. INBioparque is an educational and recreational center focusing on conservation and biodiversity and is located just outside of San Jose.

The park is very modern and has new facilities. The color and architectural scheme are consistent throughout the park. The uniforms of all staff, excluding the groundskeepers, are bright blue and bear the name of the facility. These uniforms make the employees easy to locate and identify. All of the receptionists and employees in contact with visitors are bilingual. The signs and pamphlets are bilingual as well. At the start of the trails, there is a sign bearing the a map of the different trails, their distances and approximate durations. The trails are guided either by one of the park's guides or by a guide book.

The self-guided tour is taken by following colored tiles on the pathway. In the guide book, numbered sections correspond to specific species on the trail. This guide book can be purchased separately for $1.50. On the trail, each major species group is introduced by a large, bilingual sign that describes the natural environment and conservation. Individual species along the trail are identified by signs stating the common and Latin names of the species. The signs are metal and have a printed color label. Specific specimens are tagged with a number for research purposes. Periodically on the trail, there are trash cans with separate bins for paper, bottles and other trash.

The park offers other products beyond the distribution of information. Midway through the park, there is a coffee stand offering cappuccino, latte, espresso, coffee, cold drinks, packaged snacks and baked goods. The coffee shop offers only things that can be

microwaved or prepared on site in order to reduce the amount of equipment needed. There are outdoor tables and chairs on the patio next to the coffee shop. This is located next to a waterfall and the outdoor theatre. At the top of the waterfall, there is a lookout point. This gazebo offers views of the horizon and the whole park. The waterfall flows into a pond, over which there is a platform for viewing of wildlife.

The gift shop is located near the entrance of the park, for accessibility both on the way in and on the way out. The shop sells not only wildlife gifts characteristic of the park but typical Costa Rican gifts as well. There are books, language dictionaries, jewelry, t-shirts, crafts and other trinkets and cold bottles of water. The salesperson in the gift shop speaks English and Spanish.

There is no sign at the entrance of the park indicating the price of admission. The following information was collected by communication with the receptionist. The price of admission for Costa Rican residents is 1000 colones. Tourists pay $18 for a self guided tour, $21 for a guided tour, $9 for children and $10 for transportation from a San Jose hotel. INBioparque's transportation is run by a company in San Jose called Costa Rica Temptations. When working for the park, this agency wears INBioparque uniforms. They offer transportation from certain hotels in San Jose.

5.7 Guide Information

Through communication with tourist agencies, we have found many different options for tour guides. Many tourist agencies employ their own guides. They use these guides for all of their programs. Other agencies make use of a pool of freelance guides. Most of these agencies have their own list of guides that has been created through experience with

the guides and recommendations. Tourist agencies would provide their own guides for programs to the garden.

Another option for guide hiring is the list of certified guides that has been collected from ICT. The list includes the names, languages spoken and specialties of all guides registered with ICT. The complete list can be found in Appendix E.

5.7.1 Guide Training at INA

As indicated by several tourist agencies and Julio Sanchez, the Instituto Nacional de Aprendizaje offers classes free of charge to Costa Rican tour guides. Communication with Marvin Campos, the Administrative Supervisor at INA resulted in the collection of courses description materials. He indicates that in order to take part in INA's programs, the guide must have a high school degree, be eighteen years of age, be able to speak at least two languages, present a letter from his or her employer, pass a test and take an interview with the association. INA offers one program in bird watching guide preparation. The course begins in August and lasts for one month. The course includes forty hours of class time. The course involves travel to several national parks, including Carata. INA offers many other classes for tour guides that focus on general Costa Rican topics. These topics include the history, literature, culture, natural history, and tourist geography of Costa Rica.

These courses may be of importance when hiring and training guides for Lankester Botanical Garden's bird watching program.

5.8 Transportation Costs

To assist in the evaluation of transportation options we visited several dealerships and agencies. Data gathered includes prices for buying, outsourcing, renting and for leasing. Information regarding warranties and payment plans was collected. Rental costs including insurance and mileage fees were also examined.

5.8.1 Vehicle Purchase Options

The six major auto dealerships that we visited were Mercedes, Hyundai, Mazda, Toyota, Kia, and Ford. We priced all minibuses without import taxes. This generated a savings on average of approximately ten to fifteen thousand US dollars. Taxes are not included due to Lankesters non-profit status and their association with the University of Costa Rica. The prices that we received can be seen in Figure 5-1.

Figure 5-1. Purchase Prices of Minibuses

Mercedes offered two different model minibuses that accommodated fifteen passengers. The first was the Sprinter and it retailed for $35,000. It comes in two different models with one having a higher roof then the other. The second minibus that is sold by Mercedes is the MB-140 and it retails for $31,000. Neither minibus was available with a payment plan. A standard parts and labor warranty is included. The warranty is for 2 years or 50,000 kilometers. In addition there are several mandatory checkups required by the warranty.

Toyota offers only one fifteen-passenger minibus, called the Hiace 15, which retails for $23,500. The company offers a 60-month payment plan with 13 percent

interest and a 30 percent down payment. There is a standard warranty included with the Hiace. The warranty is a parts and labor warranty for three years or 100,000 kilometers. The warranty requires regularly scheduled checkups.

Kia offers a fifteen-passenger minibus called the Pregao. The Pregao costs $17,000, and offers a forty-eight-month payment plan at 13 percent interest and a 30 percent down payment. The Pregao offers a similar warranty to the Hiace, which is a standard parts and labor warranty that is for three years or 100,000 kilometers. The warranty requires checkups at 1,000 km, 5,000 km, 10,000 km, and every 5,000 km after 10,000. This was the only auto dealership to give an estimate on yearly service costs and lifetime of the minibus. The Kia dealership estimated that the Pregao used for a regular daily tourist route would last approximately five years and cost $500 per year for maintenance.

Ford offers a minibus called the E-350 Clubwagon. The E-350 Clubwagon costs $33,000 with a 60-month payment plan with 11 percent interest and a 30 percent down payment. The standard warranty is a parts and labor warrant for two years or 50,000 kilometers with regular service visits required.

Hyundai offers the H-1 as the only minibus it currently has in stock. In late July, 2000 Hyundai will also offer a new minibus called the Trajet. The Trajet as of yet has no available price information. The H-1 is available now and retails for $18,000 with a forty-eight-month payment plan at 16 percent interest and a 30 percent down payment.

Mazda offers the 2200 model minibus for fifteen passengers retailing at $23,500. The standard warranty includes parts and labor for three years or 100,000 kilometers.

The usual payment plan is a forty-eight-month plan that is 14 percent interest and a 30 percent down payment.

Table 5-2. Cost Information for Vehicle Purchase

Cost	Ford E-350	Mazda 2200	Hyundai H-1	Kia Pregao	Toyota Hiace 1
Down Payment	$9,900	$7,050	$5,400	$5,100	$7,050
After Down Payment	$23,100	$16,450	$12,600	$11,900	$16,450
With Interest	$25,641	$18,753	$14,616	$13,447	$18,588
Payment per Month	$427	$391	$304	$280	$309

In Table 5-2 we can see the costs of the different vehicles using the different payment plans that were given to us by each company. The first row shows the down payment, which is 30 percent for each vehicle. In the second row, we have stated the cost remaining after the down payment. The third row shows the total cost of the vehicle with interest, and the last row shows the monthly payments for each vehicle. This data will be discussed later in the data analysis chapter.

5.8.1.1 Interview with Harry Alverez

Harry Alverez is the owner of the Cambiar y Fuerza a local auto repair shop. We interviewed him in order to determine maintenance costs and the expected lifetime of the vehicles we are considering. In addition to this information we also received information regarding the cost of gas and the average number of miles per gallon for each vehicle. Information given to us was both through personal knowledge of Sr. Alverez and other employees and from auto repair manuals.

Sr. Alverez told us the expected lifetime in terms of kilometers. The Hyundai H-1 and the Mazda 2200 are expected to last for 150,000 to 200,00 kilometers with regular

maintenance. Both the Sprinter and the MB-140 made by Mercedes have an expected lifetime of 150,000 to 300,000 kilometers. The next vehicle was the Ford E-350 Clubwagon with a 120,000 to 250,000 kilometer expected lifetime. The Toyota Hiace had the longest expected lifetime at 200,000 to 300,000 kilometers. Sr. Alvarez was unable to give data on the Kia Pregao lifetime because, according to him, it is an unpopular car in Costa Rica and is not often seen in his shop.

The next category of information that Sr. Alverez discussed with us was the average mileage. All of the vehicles that we examined were the diesel models with the exception of the Ford Clubwagon, which uses gasoline. The Toyota Hiace and the Kia Pregao both have an average mileage of between 40 and 48 kilometers per gallon of gasoline. Both Mercedes microbuses had an average mileage of 35 to 45 kilometers per gallon. The Hyundai H-1 uses approximately 32 kilometers per gallon. The Ford E-350 Clubwagon uses only 15 to 25 kilometers per gallon. The Mazda 2200 Van uses an estimated 25 to 30 kilometers to the gallon.

Sr. Alverez told us that the average maintenance cost per month is approximately $65 per month. This is the price for all of the cars discussed in that with the exception of the Mercedes, which can only be repaired at the Mercedes dealership. All other vehicles are maintained through similar maintenance procedures that all have similar prices. Also the price of diesel is approximately 90 colones per liter. The average price of gasoline is 160 colones per liter.

We asked Sr. Alverez for a recommendation of the best of the microbuses in terms of maintenance and longevity. He said that the Toyota Hiace is the best model due

to its high durability and ease of maintenance. He said that Toyota parts are easily found and all maintenance shops are able to work on it.

To ensure that these figures were correct we contacted two other local independent mechanics in the San Jose area. A representative from Ford referred us to them. The two mechanics were Einer Valverde from Car Doc and Javier Alverez from Auto Mecanica Express. Each of the two mechanics verified the information given to us by Harry Alverez.

5.8.1.2 Driver Cost

To determine prices for drivers for the program, we called different tour agencies and transportation companies. The companies that we called were Turavia, Baula Tours, Kapi Tours, and Transnunez. Each of the companies gave a similar rate. The rate for a driver was $300 per month at each company. We inquired into whether or not it was a common practice to hire a driver for a regular tour by the day. All of the companies told us that the typical practice is to hire by the month.

5.8.1.3 Insurance Information

Another cost that is included in buying is the purchase of insurance for our vehicles. We received rates for each of the minibuses from the Instituto Nacional Seguro, or INS. The rates we were quoted were for full coverage with the vehicles being used for tourism purposes.

Rates in Costa Rica are given based on the price of the vehicle. All policies are six-month policies and all prices are quoted on the same six-month basis. The Kia Pregao was the least expensive and had the least expensive rate at $987.70. The next least expensive rate was given for the Hyundai H-1, at $1032.45. Both the Mazda 2200

and the Toyota Hiace were quoted a rate of $1287.06. The rates for the Mercedes Sprinter and the MB-140 were $1846.33 and $1652.06 respectively. The Ford E-350 Clubwagon was quoted a rate of $1747.41.

5.8.2 Renting and Leasing

Rental agencies in the San Jose area all offered similar packages for the rental of a fifteen-passenger minibus. The agencies that we contacted were Dollar, Budget, Toyota, Alamo, Hertz, Thrifty, National, Economy, and Avis.

The costs per day were all similar with a total range of thirty dollars per day in price. The most expensive car for rent was at Budget for $95 per day with a $15 basic insurance cost and a 12 cent per kilometer fee. The least expensive car for rent was at Dollar for $65 per day with the $15 basic insurance. Insurance was a factor in all but three of the agencies we examined. Insurance ranged from $15 to $22. The three agencies that included insurance in the daily cost were Thrifty, National, and Avis. Daily costs can be seen in the graph below. Figure 4-16 indicates only the base fees and does not include insurance and mileage fees.

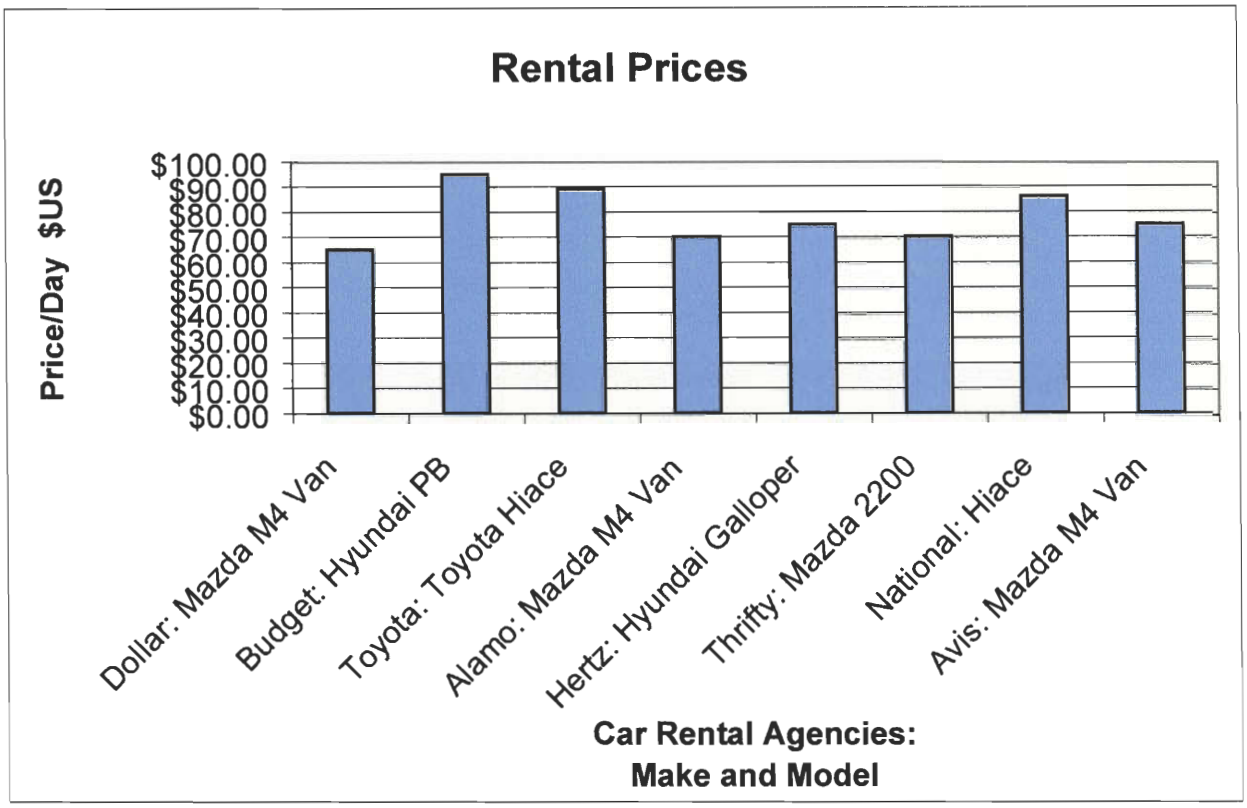


Figure 5-2. Rental Prices

We did not consider leasing as an option, because Costa Rican law is not conducive to leasing. The tax codes in Costa Rica cause the price of leasing to be very high. For this reason, leasing is not a practice found in Costa Rica.

5.8.3 Outsourcing

Our group investigated the possibility of outsourcing both the transportation and guides to a San Jose company called Costa Rica Temptations. This is the same company that operates transportation for INBioparque. We obtained an estimate for our proposed bird watching program. The program we presented for an estimate from Costa Rica Temptations begins with tourist pick

up at 5:00 a.m. from their hotels, and arrival at Lankester at 6:00 a.m. A bilingual bird watching guide provided by Costa Rica Temptations then leads a tour until 9:30 am, when the tourists are taken to a nearby restaurant for brunch. At 11:00 am, the tourists are taken to two of Cartago's main attractions, the Basillica de los Angeles and the Ruins. The tour leaves Cartago for San Jose at noon. Groups of customers could change any of these times at their discretion.

Certain information was required for pricing estimates to be given. Among them were number of tourists, total time, and services required. The tour will be for two to eight people. This number was decided upon based on the size of vehicle provided by Costa Rica Temptations. In order to accommodate groups of ten, a larger vehicle would be required. We decided that for our purposes, a smaller group would be more appropriate. The total tour time in the proposal for Costa Rica Temptations was six hours. Upon submittal of these specifics, we requested rates for transportation, guides, and brunch.

The agency quoted that the price for an air-conditioned vehicle with a driver would be $85.00, and the bilingual guide would be an additional $50.00. In addition to that, each person would be charged $4.00, the Lankester entrance fee, and $12.00 for brunch. These prices do not vary according to group size. The entire proposal is contained in Appendix H.

Costa Rica Temptations requires written notification forty-eight hours in advance. Requests and reservations can be faxed to (506) 220-27-92 or emailed to reserv@crtinfo.com.

5.9 Tourist Agency Information

The three tourist agencies that were interviewed are Baula Tours, Cosmos Tours and Kapi Tours. All of these agencies are in Costa Rica and were chosen by no specific process. Each of these agencies operates their programs in different ways.

Baula Tours currently operates bird watching tours in Tortuguero and Monte Verde. They have their own guides and specialists. These guides are biologists and have experience from living in the specific tour area. Baula owns Ford and Dodge vehicles that have air conditioning. The Ford mini-van holds fifteen passengers and the Dodge mini-bus holds thirty to forty passengers. The guides they hire have some of their own equipment.

Cosmos Tours rents all transportation and hires all guides from the outside. They have their own list of guides based on referrals and previous experience working with them. All guides must have an identification card from the INA which shows that they have had guide training. Most have studied biology, nature or ecology at UCR or National University. The motor coaches they use are rented from a company called Heredia in Cartago. Cosmos Tours currently include Lankester in tour packages.

Kapi Tours runs a bird watching program that is eight nights and nine days. It operates tours to Arenal, Cano Negro and Monte Verde. The agency has its own bird watching guide for this program. Their guides have degrees in biology. The degrees are from INA, UCR or National University. Kapi Tours agency has its own transportation: vehicles for fifteen to forty five passengers, as well as rental cars. They currently operate tours to Lankester Botanical garden.

5.10 Hotel Information

Much of the information we gathered from the hotels was similar, but there were a few hotels that varied in what they said. The complete write-up of the hotel communications can be found in Appendix C.

The high season for most of the hotels is from November through April, as this is the dry season. Two hotels, however, said that their high seasons were between May and August. Few hotels market to specific groups. Most hotels market to all age groups of tourists. One hotel, the Aurola Holiday Inn, markets specifically to business people because of its central location. The Hostel Toruma markets specifically to students. The Hotel Aranjuez markets to medium budget travelers and backpackers.

Three of the hotels, the Aurola Holiday Inn, the Don Carlos, and Villa Tournon, have their own internal travel agency. Some of the hotels own and operate their own transportation for tourists. This includes transportation from the airport as well as for tourist activities. Most of the hotels, however, do not own their own transportation and rely on that of outside agencies. In some cases it is very common for outside tourist agencies to pick up guests for tours. There is only one hotel, the Hostel Toruma, that does not have outside agencies pick up its guests.

None of the hotels with which we communicated currently carry pamphlets promoting a bird watching program. All of the hotels would be interested in carrying pamphlets containing information on a bird watching program at Lankester Botanical Garden.

5.11 Radio Advertising Information

In the course of our project, we investigated two main options for advertising on the radio. In Costa Rica, radio stations are not required by law to play public service announcements. As a result, the option of getting free advertising through public service announcements is unavailable at commercial radio stations.

Radio Universidad, the radio station of the University of Costa Rica, agreed to air any Lankester Garden advertisement or announcement free of charge. The station will promote any University organization for free. Any written announcement or advertisement should be given to Anamaria Madrigal at the station on campus

Our group also examined the possibility of advertising on commercial radio stations. The Radiocadena Fundacion runs four radio stations: 103 La Radio Joven, Radioactiva 91.5 FM, Momentos 89.1 FM, and RadioLibertad 570 AM. Of all radio stations in Costa Rica, these are three of the most listened to; 103 is ranked number one, Radioactiva is ranked number two, and Momentos is ranked fifth. Table 4-2 shows the cost of purchasing commercial time on one or a combination of these stations.

Table 5-3. Radio Advertisement Costs

Cost of Radio Advertisements (in Collones)

	15 seconds	30 seconds	45 seconds	60 seconds
Radioactiva	¢4300	¢5500	¢8200	¢9200
103	¢5750	¢6750	¢10000	¢11000
Momentos	¢2450	¢3500	¢4000	¢5500
103 and Radioactiva	¢9500	¢11750	¢17000	¢19500
103, Radioactiva, and Momentos	¢11000	¢13500	¢20000	¢22500
RadioLibertad	¢1500	¢2000	¢2500	¢3000

In addition to these prices, Sergio Mora, an advertising executive at Radiocadena Fundacion, informed us of another option. Instead of purchasing time and also producing a commercial to play in that time, a disc jockey can read a ten second ad for a reduced

fee. The cost of a ten second announcement on 103, Radioactiva, and Momentos is ¢3700. The cost of a ten second announcement on all four of Radiocadena Fundacion's stations is ¢4500.

Sergio Mora can be contacted at (506)283-8111 or at carafu@sol.racsa.co.cr. Freddy Bolaños, another advertising executive at Radiocadena Fundacion, can be contacted at (506)283-8828.

6. Analysis of Results

The next step in developing a set of recommendations is the analysis of the data recorded in the previous chapter. The analysis follows.

6.1 Cost Analysis of Bird Watching Program

The cost estimations that we have conducted include only those costs incurred directly by the bird watching program. They do not include the costs of everyday garden upkeep. We calculated the first estimation of cost for the purchase of a vehicle. We conducted the break-even analysis as follows.

The payment per month for the vehicles was used in this cost analysis. For this break-even analysis, we took the average of the monthly payments. This was our experimental monthly payment. This payment is $342 per month. The two Mercedes vehicles were not used in the average, because they were not available with monthly payment plans. The cost for the driver was determined from the data obtained from local tour agencies. This cost is $300 per month. The cost for the guide was determined from the data received from Julio Sanchez and Jaime Aguilar. The wage decided upon was $50 per tour.

We also accounted for insurance, maintenance and gas costs in this analysis. The insurance rate used in this analysis is the average of those rates quoted to us by INS. The average cost of insurance is $210.

We obtained the cost of maintenance, $65 per month, by consultation with a mechanic. Our group calculated the cost of gas by using the average diesel price of 90 colones per liter. The approximate distance from San Jose to Lankester Garden is twenty-seven kilometers. The entire distance covered in a tour would then be one hundred eight

kilometers. For this analysis, we allowed for another ten kilometers in this distance. This was to account for different distances from various hotels to the garden. The distance used is one hundred and eighteen kilometers. Table 6-2 shows the calculations used to determine diesel price.

Table 6-1. Information Used to Determine Diesel Price

Average Mileage per Gallon	Distance Traveled	Cost per Liter (colones)	Cost per Gallon (colones)	Total Cost for Tour (colones)	Total Cost of Diesel for Tour (dollars)
7.81 km/ liter	118km	90 colones	360 colones	1,397 colones	$4.66

The rate for the tour was determined from the data collected from other bird watching tours. Because we wanted to ensure sufficient revenue for the proposed bird watching program, we decided to create a group rate. This rate is $70 for a maximum five people. Each additional person would pay $10. This rate is similar to that offered by Cosmos Tours in San Pedro. The rate determined for transportation is $90 for a maximum eight people. Compared to other agencies' rates, this seems reasonable. As discussed in the Results chapter, Cosmos Tours runs a bird watching program to Cartago and charges $90 for transportation. This rate would be profitable if sufficient numbers of tourists participated. A summary of these costs and rates can be seen in Table 6-3.

Table 6-2. Costs and Rates for Estimate of Purchase of Vehicles

Vehicle cost per month	$342
Driver cost per month	$300
Maintenance cost per month	$65
Insurance cost per month	$211
Diesel cost per month	$5
Guide cost per tour	$50
Rate charged for tour	$70 for up to five people
	$10 for each additional person
Rate charged for transportation	$90 for up to eight people

After all of the costs and rates were determined, we grouped them into fixed and variable costs and revenue. These groupings can be seen in Table 5-3.

Table 6-3. Fixed and Variable Costs and Revenue for Estimate of Purchase of Vehicles

Fixed Costs	Variable Costs	Revenue
Vehicle Cost/month	Gas	Price per group of 5
Drivers	Guides	
Maintenance		
Insurance		

The break-even analysis graph for the purchase estimation was created following the procedure described in the Literature Review, Chapter 2. As can be seen from Figure 6-

1, below, the break-even point is above eight groups per month, so the garden would need to bring in at least nine groups per month if it were to purchase a vehicle.

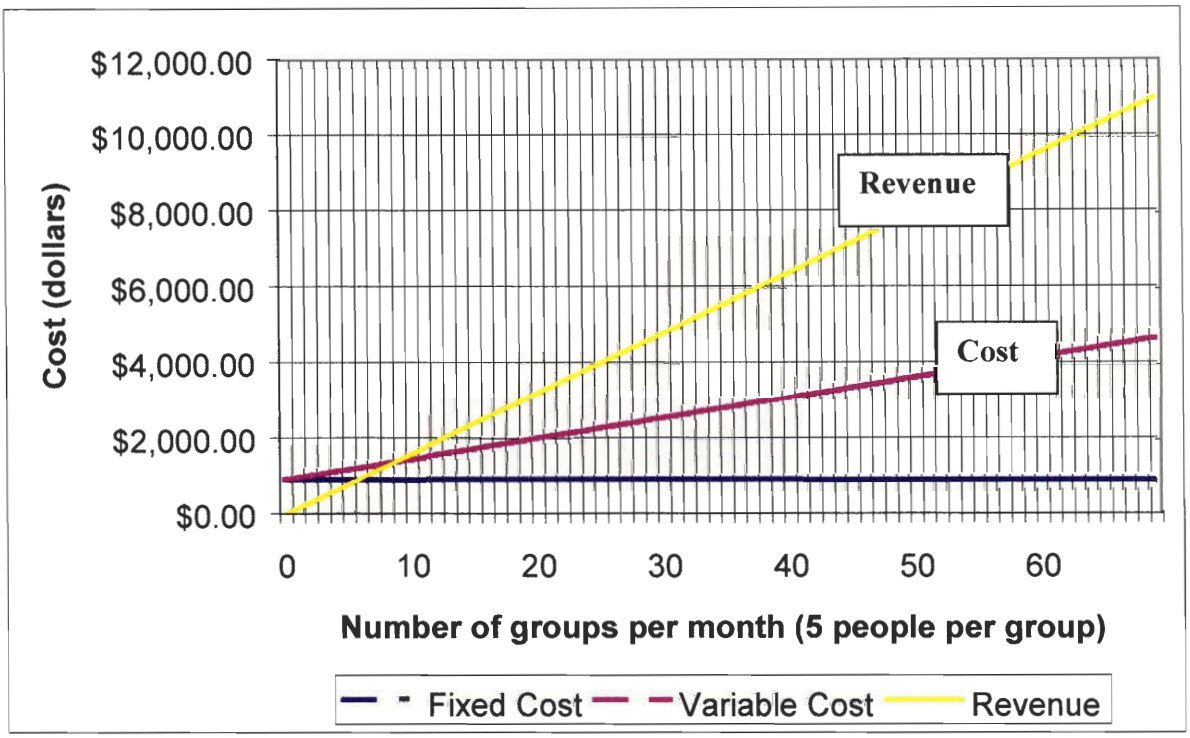


Figure 6-1. Break-Even Graph for Purchase of Vehicles Estimate

There are some details not accounted for in this graph. The first is the startup cost for the transportation. Each vehicle has a down payment due at purchase. These costs are identified in the Data and Results, Chapter 4. The second detail not accounted for in the graph is the revenue made from additional tourists. The rate graphically represented by the revenue line is $70 for a maximum of five people. It does not account for the $10 made for each additional person above the five. The maximum number of tourists per group is eight, so the maximum revenue for each group would be $100.

The second estimation of cost was calculated for the rental of a vehicle. The break-even analysis was conducted as follows. An average rental fee was created from the eight specific rental fees. Those vehicles that required an additional insurance fee were averaged in with that additional fee added to the normal rental fee. This can be seen in Table 6-4.

Table 6-4. Costs for Rental Estimate

Rental Agency	Rental Price	Insurance	Total Price
Dollar	$65	$15	$80
Budget	$95	$15	$110
Toyota	$89	None	$89
Alamo	$70	None	$70
Hertz	$75	None	$75
Thrifty	$70	Included	$70
National	$86	Included	$86
Avis	$75	Included	$75
		Average	$82

The wage of the driver was determined from the data collected from the tour agencies. The wage used is $25 per day. The wage for the guide was $50 per tour, the same as in the previous analysis.

The rate charged is also the same as in the last estimation, $70 for a group of up to five people, and $10 per additional person. The transportation rate was the most difficult to determine. The daily transportation cost is approximately $103 when the driver and rental fee are combined. The tourists would then need to be charged a rate higher than

this cost in order to make a profit. This price is unreasonable as determined by comparison with other agencies and programs. However, for this example, we have chosen a transportation rate of $110 for up to ten people.

The groupings of fixed and variable costs can be seen in Table 6-5 and the break-even graph can be seen in Figure 6-2.

Table 6-5. Fixed and Variable Costs for Rental Estimate

Fixed Costs	Variable Costs	Revenue
None	Rental	Price per group of 5
	Drivers	
	Guides	

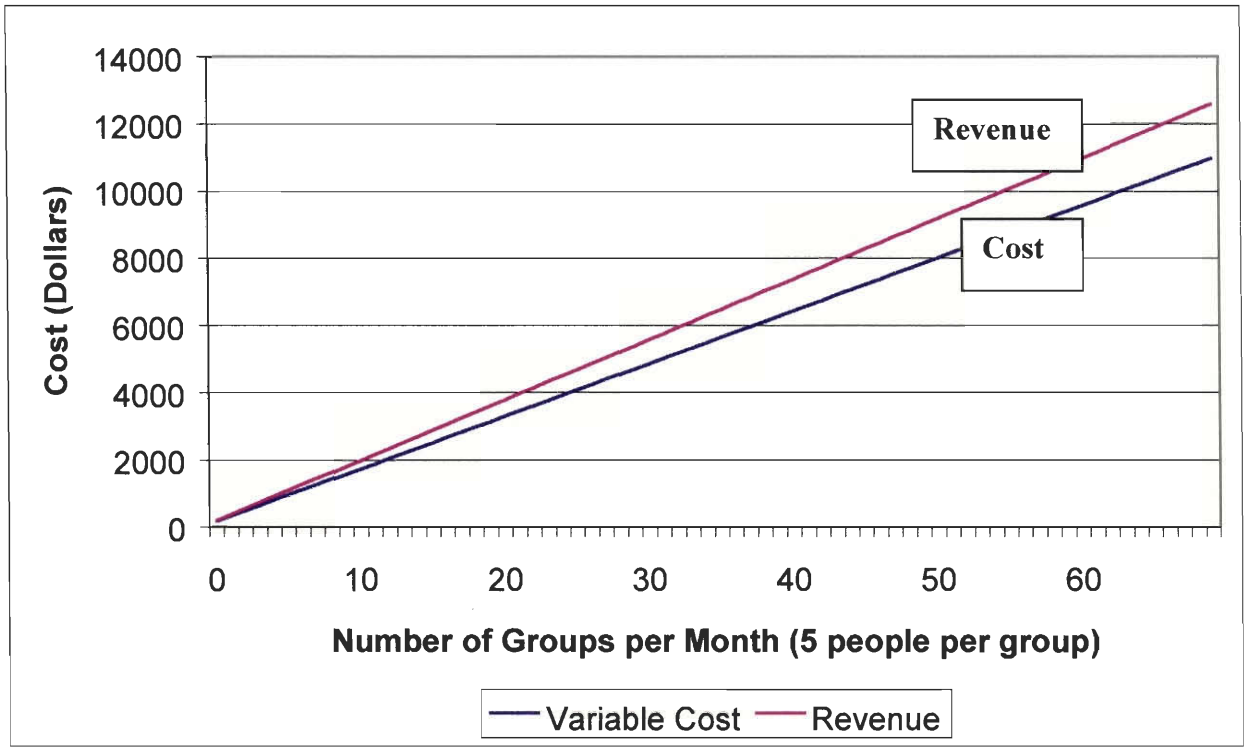


Figure 6-2. Break-Even Graph for Rental of Vehicle Estimate

The third cost estimate for transportation that we conducted was for outsourcing. We used the Costa Rica Temptations quote presented in the Results chapter. The quote included fees for the outsourcing of a vehicle and a driver as well as a tour guide. These fees were $85 for the transportation and $50 for the guide. As in the rental estimate, there are no fixed costs. Because there are no monthly fees, there are only costs that vary with the number of tours operated. The summary of costs is shown in Table 6-6.

Table 6-6. Fixed and Variable Costs for Outsourcing Estimate

Fixed Costs	Variable Costs	Revenue
	Guide	Price per group of 5
	Transportation	Transportation fee per group of 8

The rates that we decided on for this option are the same as in the previous estimates. The fee for the program is $70 for up to five people. Each additional person is an additional $10. The transportation fee is $90 for up to eight people, the maximum tour capacity. We conducted the break-even analysis in the same manner as for the other options. The graph indicating the break-even point can be seen in Figure 6-3.

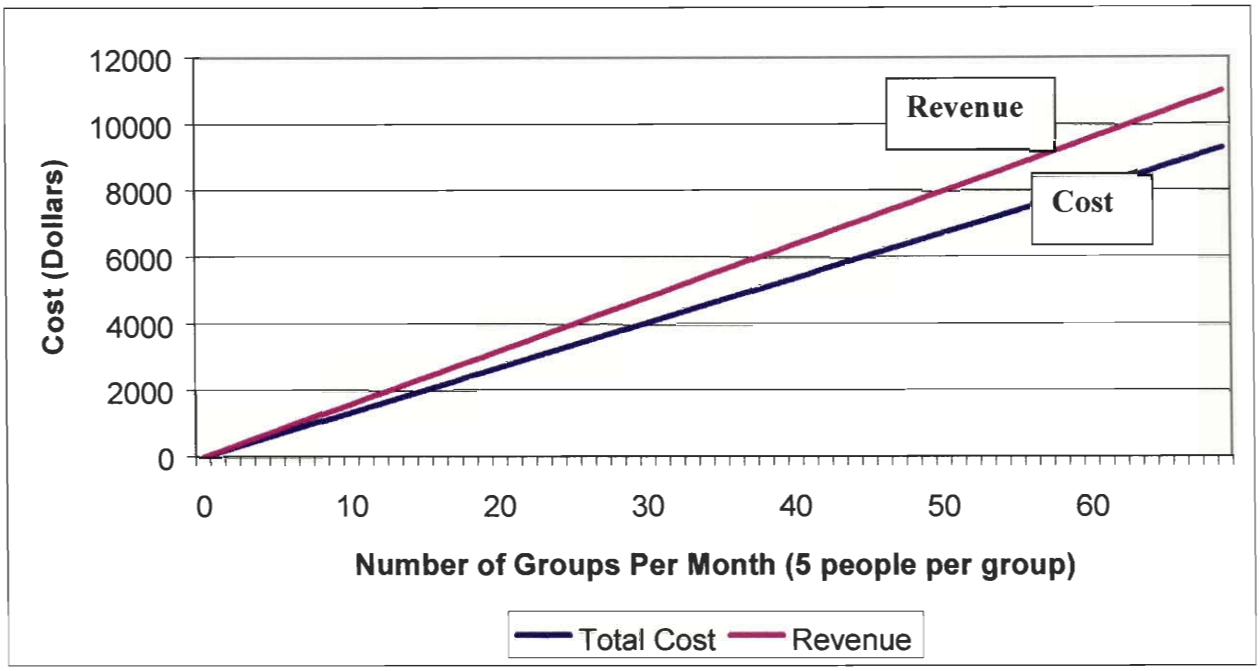


Figure 6-3. Break-Even Graph for Outsourcing Estimate

As can be seen in Figure 6-3, there is no break-even point for this analysis. This is because there is profit made for each tour, as there are no fixed costs to overcome. For each tour, Lankester Botanical Garden would make $25.

7. Recommendations and Conclusions

Based on our analysis of the data we collected, our group has developed a series of recommendations, which are included in this chapter.

7.1 Bird Watching Program

We have decided that the best kind of bird watching program for Lankester Botanical Garden will be a beginner program that introduces patrons to the birds of Costa Rica. The program will focus on the natural history of Costa Rica and the relationship between plants and birds. The following are specific recommendations for all aspects of the program.

7.1.1 Guides

Upon examination of the several possibilities for guides we decided to use Costa Rica Temptations. Costa Rica Temptations will provide a certified, bilingual bird watching guide, who will follow the set tour curriculum.

7.1.2 Transportation

Our cost analysis has shown that the most feasible transportation option is outsourcing to Costa Rica Temptations. Costa Rica Temptations will provide an appropriately sized vehicle and employees will wear Lankester uniforms.

7.1.3 Content

Because we believe this should be an introductory program to the birds of Costa Rica, we have decided to recommend that an informational packet be made up for the participants of the program. As both Julio Sanchez and Terry Pratt suggested, this packet

should contain a checklist for the birds in the garden. Perhaps this list could be printed on banana or tobacco paper to stress the importance of ecological awareness. This list will serve to familiarize the participants with the birds that are in the area and will be fun as well. We would also like the packet to contain information on the life zones of Costa Rica and what species live in them. Because this program will give people an overview of Costa Rican natural history, the packet can discuss more than avian species. The packet can also contain information on Costa Rica's current ecological issues.

We have decided to make a trip to the Basilica de Nuestra Senora de Los Angeles, the cathedral in Cartago, a part of the program. Terry Pratt encouraged this idea as a way of extending the tour. The trip to the cathedral will commence after the bird watching tour around the garden. With this trip to the cathedral, the bird watching program becomes a half-day event. This fact makes it necessary to offer a meal. The participants will be taken to a restaurant in Cartago for breakfast before the tour of the cathedral. The meal and the tour of the cathedral could be waived at the clients' discretion.

7.1.4 Scheduling

Tours should be given on an as requested basis in the beginning. As time and interest increases it may be feasible to offer regular daily tours. We recommend that tours begin at 5:30 a.m. and last until approximately noon. The tour should begin at 5:30 a.m., as this is the optimal time to see birds. This optimal time lasts until around 9:30 a.m. At this time the tour will then travel to Cartago where there will be a tour of the cathedral and lunch. This will be from 10 a.m. to around 11 a.m. The tour will then return to San Jose around noon.

7.1.5 Equipment

Although many experienced bird watchers have their own equipment, for a beginner course such as this, some equipment should be available at the garden. This equipment could be rented out to patrons without their own. Swarovsky is the best provider of binoculars in Costa Rica, but they are fairly expensive. Another option would be to post an advertisement in a newspaper in the United States, asking for donations of used binoculars. One person could collect the donations and send them to Costa Rica, possibly with next year's WPI project group.

We strongly recommend that the garden fill out and return the application for the Birders' Exchange, found in Appendix I. The equipment could be transported from Massachusetts to Costa Rica with next year's WPI project group.

7.1.6 Improved Attraction of Birds

Many species of birds already exist at the garden, but our group has learned of several methods of attracting larger numbers of birds and species. There are several species of plants that attract birds. This list can be found in Appendix E. In addition to the plants, several types of bird feeders can be employed at a relatively small expense. Nectar feeders will attract hummingbirds, and seed and fruit feeders will attract other species of birds in abundance. Our final recommendation is the construction of a "mirror," or larger body of water that can be seen easily from the sky. We believe that all of these methods should be implemented as soon as possible.

7.2 Marketing

Our group has devised an inexpensive and effective marketing strategy, involving the strategic placement of pamphlets, notification of guidebooks, a Lankester web site, and other forms of advertising.

7.2.1 Pamphlet Locations

Our group has determined some optimal locations for the placement of Lankester Botanical Garden pamphlets. All of these locations are free of charge, although an employee may inspect the pamphlet before it is displayed. The ICT desk in the international arrivals terminal at Juan Santamaria International Airport is a key location, for reasons discussed in the Chapter 4. The car rental desks at the airport would be other good locations. We believe that brochures should be left at all of the hotels and tourist agencies on our compiled list (see Appendix C). We also recommend the placement of brochures at major language schools and other tourist attractions, like Inbioparque. By placing brochures at other locations that market to tourists, Lankester can take advantage of those locations' marketing strategies as well.

7.2.2 Guide Books

Although guidebooks are very influential to foreign tourists, most are updated only every two years. All three guidebooks we used, *Lonely Planet*, *Fodor's*, and *The New Guide to Costa Rica* published their latest edition this year. Letters should be submitted to these guidebooks detailing changes as soon as possible.

7.2.3 Other Advertising

Press releases should be sent to *Bird Watcher's Digest* and the *American Birding Association*. This is a free method of informing bird watchers in the United States of a new program at Lankester. Written ads should also be submitted to local radio stations, including the University station, which is free, and Radiocadena Fundacion, which controls three of Costa Rica's top five radio stations.

7.2.4 Marketing Through Tour Agencies

One other beneficial marketing strategy would be the promotion of the bird watching program through tourist agencies. Once the program is advertised to these agencies, they will be able to include it in tour packages and recommend it to customers. Information on the program should be sent to agencies in Costa Rica and other countries.

When a tour agency makes arrangements for activities such as this bird watching program, they make a standard 25 percent commission, as stated by Terry Pratt. This commission should entice tourist agencies to sell the program and bring in more customers.

Because the program we have proposed is a full half-day tour and includes more than bird watching, we feel that this will be an enticing program for both single travelers and tour groups. Perhaps, if booked in advance, special rates could be developed for tour groups. Because these tour groups generally use their own transportation, no additional costs would be incurred by the garden for transport.

The program should also be advertised to hotels that arrange tours for their guests. Terry Pratt says that hotels make a standard 10 percent commission on the activities that

they book. As with the tourist agencies, this may provoke hotels to recommend Lankester's bird watching program.

7.3 Web Site

The web site should be maintained and updated regularly, and hosted at the University of Costa Rica. It is unknown at this time if the University will provide adequate bandwidth and other hosting services. In the event that the University becomes an inadequate host, the site should be hosted at WPI, if possible, or at any of the many inexpensive United States-based hosting services.

Regular upkeep of the site is vital, especially if the site remains at the University of Costa Rica. Without regular maintenance, the University will delete the site. Regular upkeep is necessary to attract new visitors and to encourage old visitors to return to the site. Additional information about web site maintenance in available in Appendix J.

7.4 Alliances

In the course of our project, we pursued alliances with several organizations, both in the United States and Costa Rica, with varied success. The recommendations for future pursuit of these alliances follow.

7.4.1 WPI Biology Department

A meeting has been arranged between Jorge Warner and Professor Pam Weathers of the WPI Biology Department. This meeting will take place on July 4, 2000 in Costa Rica. Specifics of an alliance will be discussed. We feel that it is important that Lankester Botanical Garden pursue this opportunity. Our group feels that if alliances can

be formed with this organization, the garden will have a stronger research pool and an opportunity for funding.

7.4.2 Audubon Society

Due to the lack of response from this society, we cannot recommend specific action in the formation of alliances. However, we do feel that it is important that Lankester Botanical Garden pursue this opportunity. We feel that if alliances can be formed with this organization, the garden will have a stronger research pool and opportunity for funding.

7.4.3 Aerial Tram

From the interview with Luis Sanchez we feel that is safe to recommend an alliance between Lankester Botanical Garden and the Rainforest Aerial Tram. The alliance will allow for joint funding possibilities. This possibility alone makes this an attractive alliance. Also the proposed creation of an exhibit at the Aerial Tram would increase the exposure of the garden. We feel that these are very beneficial and the garden should pursue this alliance.

7.5 Future Projects

During the course of our research we observed several areas where our project could have been expanded greatly. These areas were too large to fit into the scope of our study and we feel that they could become their own project topic. The below list contains possible future projects that could be completed by WPI students.

1) Investigation of land acquisition and expansion possibilities for the garden.
2) The creation of an accurate map of the garden.
3) Examination of alliances between the garden and other organizations.
4) Exploration of implementing community related programs.
5) Determination of suitable areas for placement of a "mirror"
6) Evaluation of Lankester's current information system.
7) Linkage of Lankester to tour groups in various countries for advance tour sales

The first is the purchase of land for the expansion of the garden. The area is located across the street from the main building. This area is currently a vacant lot. The area is flat. If Lankester Botanical Garden purchased this area it would be possible to build more modern facilities. This area could be developed for displays, such as those found at INBioparque. This display area could teach visitors about the importance of conservation and biodiversity. A project group would need to determine whether or not the land could be purchased for a reasonable price and if it would be feasible to build the new facilities.

There have been efforts in the past to create an accurate map of the garden. We feel that the creation of a detailed map of the garden would be beneficial. This would allow for more efficient research. In addition, it would be beneficial to tourists as the current map is vague and confusing. This project would be beneficial to the creation of Jorge Warner's master plan.

During our project it was suggested that we pursue alliances with other organizations. We pursued three, but due to time constraints, we were unable to succeed on all accounts. We therefore are suggesting an entire project on the creation of alliances between the garden and other organizations. By making this an entire project, the time and attention that is needed for the creation of proper alliances would be applied. There would also be a great deal of analysis required. It would be necessary for the group to decide whether the proposed alliances would be beneficial to the garden. These alliances could be with either organizations from the United States, Costa Rica, or elsewhere. The benefits could include improved fundraising and research sharing.

One of the suggestions that were given to us by Luis Sanchez and Julio Sanchez was the use of the gardens facilities for the education of children. An WPI project group could do research into the possibility of creating programs such as this. Also ways to fund the program would be necessary due to budget constraints. This would have a great deal of social impact on the surrounding community, and could involve creative applications of technology.

Another possible project topic could be the placement and creation of a "mirror" for birds. A mirror is a body of water that attracts birds to a certain area. There have been suggestions made to us by both Julio Sanchez and our liaison Jorge Warner as to the best spot for the mirror. The most suitable area may not be one of the two areas currently under consideration. Research into which of the two sites suggested is the best would be required, as well as a feasibility study and cost-benefit analysis. The determination of the best area for the placement of the mirror would be very beneficial to the garden and would increase biodiversity in Lankester.

The current filing and information system at Lankester is out of date. A project that addressed a better filing system and information collection might be appropriate. Taxonomy is the base area of all research at Lankester. This requires a very efficient and easy to use filing system. Different filing systems would have to be examined and the most feasible would allow for an improvement in the research at the garden.

The last recommendation that we have for future projects at Lankester Botanical Garden is the linkage of the garden to tour agencies in Costa Rica and other countries. If agencies could be made aware of the programs that Lankester offers, they could make them part of tour packages. Advance ticket sales could receive a special price and would serve to bring in more business for Lankester.

7.6 Other Improvements to the Garden

We feel that there are some necessary improvements to the garden that do not fall under our project's jurisdiction. The first is the creation and placement of more signs in the garden. This request has been made by many customers of the garden through previous WPI projects, and will be vital to running successful programs in the garden. We feel that if more people are going to be utilizing the garden through new programs, they will need to be informed about the garden's plant species.

A necessary element of tourism in Costa Rica is bilingualism. We feel that it is a necessary improvement that more people at the garden learn to speak English. Classes at either language schools or INA for garden employees are key. The most critical employees in this case are receptionists. We feel that all people who work in reception should be bilingual. INA offers free classes for those involved in tourism areas.

Another improvement to the garden is the upgrading of the path system. Improving the quality of the paths themselves would allow for the garden to be universally accessible. The current path system has deteriorated and needs repaving.

One of the key buildings missing from the garden is a restaurant or a snack bar. This is the only building type that the garden does not currently have, according to our resource evaluation. We feel that a small snack bar would serve as a good source of revenue for the garden.

Increasing the number of benches in the garden is recommended. The current number of benches should be increased. We feel that the current number is inadequate. They should be evenly distributed about the garden at set intervals.

Improvements to the butterfly garden are recommended. If the butterfly garden becomes operational then it could be offered as a separate tour or as part of the bird watching tour. The butterfly garden could serve as a good source of income for the garden. An increase in the number of butterflies is needed, as the current number is inadequate for a tour.

Appendix A. Background of Lankester Botanical Garden

Charles Lankester, a British naturalist, established Lankester Botanical Gardens in the 1950's. On what was formerly a coffee plantation, Lankester gradually established an impressive collection of botanical specimens. Control of the garden was transferred to the University of Costa Rica in 1973 after the American Orchid Society and Stanley Smith Foundation of England purchased it. Today Lankester has become internationally known for its orchid collection.

The mission of Lankester Botanical Gardens is the preservation of Costa Rica's native epiphytic flora. It is also dedicated to ecological education and conservation. These goals are all accomplished through their horticultural programs and research. The garden has approximately eight hundred species of orchids and is home to plants of the bromeliad, heliconia and musceae families. The garden also contains plant species not native to Costa Rica, such as cacti. Because of the large variety of vegetation, the garden is a prime destination for those interested in botanical studies.

Lankester Botanical garden conducts base research on the taxonomy of plants. The garden specifically focuses on orchid taxonomy and the general classification of orchids. This taxonomy is vital to the study and protection of species. Researchers at the garden will go to areas outside of the garden in order to classify plants and determine the taxonomy of little known plants. By pressing and drying flora, the garden preserves species for long-term study. They can last for hundreds of years. These dried and pressed samples are given to museums, called herbarios, which house many dried species. Advanced research done by the garden includes propagation of orchids. There

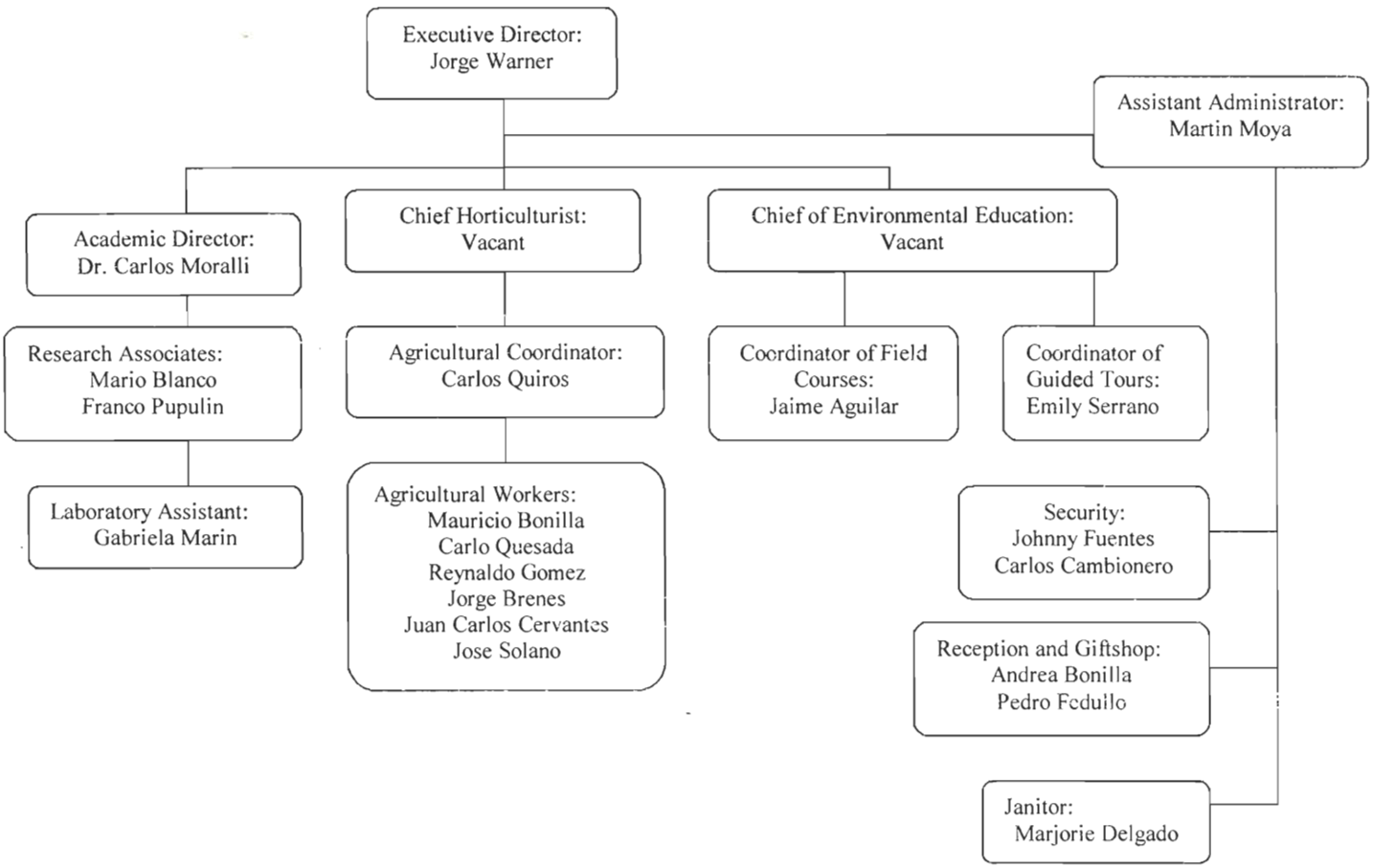
is a focus on orchid species that are endangered. The garden is also striving to compile a list of all publications with information on the physiology and ecology of orchids.

The garden receives funds from three main sources. The University of Costa Rica provides US$100,000 per year. The second main source of income comes through FUNDEVI, which handles the earnings from the gift shop, the laboratory, and the field courses. These endeavors provide an additional US$70,000 per annum. The final source of income is ticket sales, which produces another US$90,000 annually. This ticket money is used for the other expenses as well as for the rest of the personnel's salaries. In recent years, salaries have increased due to seniority, but the garden's income has remained relatively stable. As a result of this trend, 98.2 percent of the money from the University of Costa Rica now goes towards the salaries of half of the garden's staff members. The increase in salaries has put additional pressure on the garden's budget. Jorge Warner, the garden's Executive Director, hopes to remedy this situation through an aggressive campaign of improvements and advertising. He wants to coordinate this campaign with a master plan, combining short-term and long-term goals.

This plan is intended to increase the number of patrons and also allow for an increase in ticket price. Some of the short-term goals include the development of a labeling system for specific species and areas of the garden, the production of new brochures and a guidebook, and the creation of an orchid display. The purchase of uniforms for the reception staff, the improvement of communication lines within the garden, the enlargement of the gift shop and the increase of advertising are also short-term goals. He intends these goals to be completed within three months. Long-term goals, to be completed within two years, include the development of a restaurant, classroom,

auditorium, and cabins. The executive director, Jorge Warner, is also interested in developing a form of transportation for visitors, hiring guides and increasing the size of the garden's lake.

Below is a flow chart showing all of the garden's employees.



Appendix B. Summary of Formal Interviews

Interview with Julio Sanchez, President of the Organization of Ornithologists
Date: June 2, 2000

Sr. Julio Sanchez, president of the Asociacion Ornitologica de Costa Rica feels that some serious companies want biologists and people who really know birds as bird watching guides. He says that small companies are more interested in just having guides who know birds. According to Sanchez, guides who are biologists make more money than those who are not. Classes in English, natural history and ornithology can be taken at the INA in San Jose. The classes are free to those who are guides.

Monte Verde, says Sanchez, has a good pool of guides. This is because there are so many needed there due large numbers of tourists. One such guide is Deborah DeRosier, who is known by Sanchez.

Sanchez believes that seasonal guide hiring would be best for Lankester Garden's bird watching program because the number of tourists varies greatly be season. He says that most tourist agencies will operate tours to the Cartago area.

The salary of a bird watching guide, says Sanchez, depends on the guide. Some make $65 to $100 for a whole day program. Most guides earn less than $100 a day. He says that there are only about five guides in Costa Rica that make more than $100 a day.

Sr. Sanchez feels that what is most important about a bird watching program at Lankester Botanical Garden is that it is safe for both birds and tourists. More than one hundred bird species can be seen at Lankester. Because of this large number, he feels that it is a good place to introduce tourists to the birds of the Central Valley. Sanchez feels that the majority of the tourists will be interested in more than just the birds. They

will be interested, he says, in the natural history of Costa Rica as well as the orchids in the garden. If the garden could obtain permission to use the adjoining marshland, Sanchez feels that the program would be more interesting. There are different species found in this area than in the garden itself.

Sanchez has been involved with many natural history and birding programs in Costa Rica. He says that there are different levels of bird watching programs. Most experienced bird watchers have studied books before arriving in Costa Rica. They can, Sanchez says, identify the birds they see. He feels that a beginner program would best suit Lankester Garden. He says a checklist for birds would be good for the beginner program. Sr. Sanchez feels that the Lankester bird watching program would function well as an introductory program to the natural history and birds of Costa Rica, because birds are best found in the forest, not in the garden.

Sr. Sanchez says that the "hook" of the program will be making is available to children in Costa Rica. He says that they do not have the opportunity or the equipment to learn about birds.

According to Sanchez, it is difficult to get birding equipment in Costa Rica. Because of this difficulty, collection of equipment in the United States is a good idea. He has been involved in this kind of collection before. The equipment can be old but in good condition.

There are many migratory birds that can be seen at Lankester Garden. Sanchez says that there are about one hundred species of birds at Lankester. Some of the species should not be seen there, but they are. Why they are found there cannot be explained. The area is small and surrounded by coffee plantations. It does not seem feasible that

three tropical species, the Scaled Antpitta, the White Bellied Wood Wren and the Collared Trogon, would be found at Lankester Garden. The Sage Wren is a species that can be found in Cartago, but, elsewhere, it can only be found in Canada and Argentina. Sanchez says that it must like the wet pastures of Cartago.

Sanchez has several suggestions for Lankester in order to improve the bird watching capability. He feels that the southwest area of the garden would be a good place for a pond. The pond would attract birds by acting like a mirror and reflecting the sky. Also, planting specific types of trees and flowers would attract birds. For example, hummingbirds can be attracted by the plant Stachytarpeta jamaicensis. Sanchez also suggests feeders with nectar, fruits and seeds to attract birds.

Interview with Jaime of Lankester Botanical Garden
Date: May 30, 2000

Jaime Aguilar, the director of field courses at Lankester Botanical garden, is aware of two birding organizations in Costa Rica. These organizations are the Association Costarricense and the Club de Pajaros Norte Americanos. He is not a member of either of these organizations, but he knows people in these organizations and goes to some of the meetings. He collaborates with the Association from the outside. They have a meeting each year Lankester Botanical Garden. Aguilar takes part in the yearly census of species put on by the Association, which takes place in Cartago in December. Aguilar is acquainted with the president of the Club de Pajaros Norte Americanos, Richard Rodriguez. He also attends meetings for this group.

Aguilar indicates that the number of bird watching tourists has been growing for the last ten to fifteen years and that, because of this, being bilingual is a necessary trait of

a bird guide. He feels that it is important for guides to be able to speak English. Lankester, he says, offers basic bird courses, taught by Julio Sanchez. There are also talks offered once a month. Aguilar feels that these courses would provide a minimum background for a bird watching guide. Many guides, he says, work after taking courses at Lankester. There are also formal speeches and tours offered on specific bird species. These are presented for small groups of sixteen to twenty people.

Aguilar feels that it is important to have an ornithologist on hand year round for bird watching programs, but he also feels that during the prime time for bird watching, it is important to have more guides. This prime time is from October to May because of bird migration. However, this time range is not consistent for all species. Some species are more interesting to observe in one season rather than another.

Aguilar feels that the first day of a tourist's trip is a good time to go bird watching and look at flora. He says that tourists are usually tired from travel, and that this is a good way for them to relax before beginning their itinerary.

There are three to five people that Aguilar is aware of that would be willing to work at the garden as bird watching guides. These guides who, he asserts, are good, serious, and interested guides. These guides are generally busy for periods of time; he feels that they could be free as needed. Aguilar feels that because these guides are professionals, they would need to be paid about $50 dollars a day. He does point out, however, that this is not a fixed number. Aguilar says that the optimum number of people in a bird watching group is fifteen. He does add, however, that a good bird watching group can have two people and that the maximum number is twenty.

Aguilar says that from his experience, it is good to offer information about flora to bird watchers as it allows them to see how the birds relate to the flowers. He feels that the flora of Costa Rica is complimented by its birds.

The Central Valley is a good place for bird watching, Aguilar says, because other regions have many houses and people, making it difficult to see birds. Lankester is located in the Central Valley, and many birds can be seen there. One bird that Aguilar says is special enough to mention at Lankester is the Grallaria guatimalensis, an antpilla bird.

Aguilar says that it is often typical of a bird watching facility to provide birding equipment. He says that those who study birds usually have their own equipment, but those who watch birds do not. Jaime says that an optical company, Swarovski, has offered to provide rental of binoculars to the garden. The company is represented in Costa Rica.

Interview with Terry Pratt of Horizontes Nature Travel
Date: June 8, 2000

Terry Pratt is the marketing director at Horizontes Nature Travel in San Jose. She has been a bird watching guide in Costa Rica in the past. Pratt feels that birding organizations are key to the running and marketing of a bird watching program. She says that these organizations could be useful for finding interested guides and finding out a good form for interviewing guides. These organizations can be used for marketing, as well. Pratt recommends bird chats online, the American Birding Association, Bird Watcher's Digest and the Specialty Travel Index. The latter of these groups is more expensive and must be contacted directly. The American Birder's Association can be alerted to the program by a press release. Press releases, she says, can be a very

important source of free marketing. The national market for our program, Pratt points out, should include the North American Birding Club, schools, and ornithology classes.

Pratt says that it is very important to know both the product and the audience for this bird watching program. She feels that it is not enough to just take people to look at birds. It is important, she says, to have a script for the tour. She suggests a printed checklist for the program, perhaps printed on recycled, banana, coffee or sugarcane paper. Pratt indicates that an informational packet for the tourists would not only be educational but also add to the value of the program. This packet could include information on life zones, species in those zones and the history of Lankester Garden. Pratt points out that the famous Costa Rican ornithologist, Alexander Skutch, married the sister of Charles Lankester. Another suggestion that Pratt has is to run a combined tour with another area location. She suggests the Basilica de Nuestra Senora de Los Angeles, the cathedral in Cartago. She says that tourists will be willing to purchase souvenirs from the garden. These could include a CD of bird songs at Lankester Garden and photos of the birds. Marco Tulio is a bird photographer in the area.

There are other areas, Pratt says, that need attention when starting a new program. The product must be registered, entrance tickets must be made, and legal invoices for tourist agencies created. She says that most agencies make a minimum twenty five percent commission on tours. There also will need to be, she says, personnel at the garden that will be in charge of reservations.

Interview with Yolanda Elliot and Sylvia Alvorado of OTS
Date: June 13, 2000

This interview was conducted at OTS in order to gather information on bird watching programs in Costa Rica as well as information on ecological education in Costa Rica. The interview was conducted with Yolanda Elliot, the manager for Esintro, and Sylvia Alvarado, the director of public relations. Yolanda Elliot is in charge of commercial activities for the biostation.

Alvarado feels that bird diversity is an important part of a bird watching program. She also mentions that facilities, such as bathrooms and classrooms, are necessary. Bird watching, she says, is a form of ecological education in that it makes people aware of natural diversity. Such awareness, she adds, allows for increased conservation efforts.

Both women feel that it is easiest to subcontract transportation. Buying is expensive, they say, due to maintenance and drivers. The guides that are hired by OTS are both resident biologists and free lance guides. OTS trains the guides. This training is not available to outside agencies. They feel that giving tourists information on the diversity of Costa Rica, endangered species and what they can see in Lankester Botanical Garden is a good overview of Costa Rican natural history.

When asked about potential problems when starting a new bird watching program, they mentioned that weather might be a problem. It rains early in the day in May through November, and Cartago is usually rainier and cooler than other areas.

According to Elliot and Alvarado, there are many ecological education issues in Costa Rica today. One effort for clean beaches incorporates an award system. Blue flags are placed on the cleanest beaches to indicate their environmental friendliness. Beaches in the Central and South Pacific areas have been most highly recognized. Elliot says that

people are attracted to Costa Rica by its ecological action. Another way of attracting tourists is through Sustainable Tourism Certification. This is a certification used for places of lodging to promote their support of sustainable tourism. There are also some recycling programs throughout the country.

Interview with Luis Sanchez of the Rain Forest Aerial Tram Foundation
Date: June 8, 2000

In order to establish cooperation with the Rain Forest Aerial Tram Foundation, we interviewed the Foundation Manager Luis Sanchez. The interview was conducted as a preliminary examination of options for partnership with the Rain Forest Aerial Tram Foundation and Lankester Botanical Gardens. Possibilities that were discussed ranged from community outreach programs to joint funding.

The first key point Sr. Sanchez brought up was the desire to establish a joint venture for the creation of a tropical document center. The location of the center has yet to be determined. Also, the content it will contain has not yet been determined. The main purpose of this document center will be to further the cause of environmental education.

Many of the programs that Sr. Sanchez wishes to create are aimed at the community. He expressed his desire to work with and in the community. He expressed his desire to find children who are in poorer areas and involve them in environmental education based programs.

In addition to programs involving students, Sr. Sanchez desires to establish programs involving teachers. The goal of these programs will be to enable teachers to

teach in an environmental fashion. Sr. Sanchez stressed the importance of educators as well as students.

One of the points that were discussed was the renewal of previous arrangements. In the past, Lankester has had an exhibit at the Rain Forest Aerial Tram. The exhibit contained various orchids from Lankester. Lankester would like to create a similar exhibit at the Tram that would advertise Lankester Garden.

Also, the use of the facilities at the Aerial Tram for orchid research was a suggested as a possible collaboration. One area that was discussed was the invitro growing of orchids. This was something that was suggested as a possible area of research at the tram by a previous IQP. This is something that was never accomplished at the Aerial Tram, but is currently being done at Lankester.

Another point that was discussed with Sr. Sanchez was the possibility of joint funding. This would be accomplished through several different means. One possible method would be through the World Bank. Currently, the World Bank is interviewing organizations in Latin America in order to find new ventures to finance. The World Bank desires to create what it calls the Meso-American Biological Corridor. According to Sr. Sanchez, the World Bank has already allocated $65 million for Costa Rican organizations. There will be a conference in Washington D.C. in October to determine the allocation of funds.

In addition to funding through the World Bank's Meso-American Biological Corridor, Sr. Sanchez has invited Lankester Garden to be part of a conference that will be held at the Tram. The conference as of yet has no specific agenda, but funding will be

one of the topics to be discussed. Organizations that will be present are the Rain Forest Aerial Tram Foundation, World Bank, OTS, INBio, and Fundacion Omar Dengo.

Sr. Sanchez then requested a draft of an agreement between Lankester and the Aerial Tram Foundation. The draft would encompass all of the points that were discussed. It would leave room for future endeavors between the two organizations.

Appendix C. Other Communications

Tourist Agencies

Baula Tours, San Jose

Baula Tours feels that bird watching is an important part of tourism in Costa Rica. They run bird watching tours in Tortuguero and Monte Verde. They have their own guides and specialists. These guides are biologists and have experience from living in the specific tour area. Baula has Ford and Dodge vehicles with air conditioning. The Ford mini-van holds fifteen passengers and the Dodge mini-bus holds thirty to forty passengers. The guides they hire have some of their own equipment.

Cosmos Tours, San Pedro

Cosmos Tours rents all transportation and hires all guides from the outside. They have their own list of guides based on referrals and previous experience working with them. All guides must have an ID card from the INA. Most have studied biology, nature or ecology at UCR or National University. The motor coaches they use are rented from Heredia in Cartago. They include Lankester in packages.

Kapi Tours, San Jose

Kapi Tours runs a bird watching program that is eight nights and nine days. It runs to Arenal, Cano Negro and Monte Verde. They have their own bird watching guide for this program. Their guides have degrees in biology. They are from INA, UCR or National University. The agency has its own transportation. They have vehicles for

fifteen to forty five passengers. They also have rental cars. They travel to Lankester for tour packages.

Hotels

Aurola Holiday Inn, San Jose

The prime time for tourists at this hotel is November through February. It markets specifically to business people because of their central location. It is located in downtown San Jose, near office buildings. The hotel has its own tourist agency located inside. The agency has its own guides and run tours to Carata Biological Reserve, Drake Bay Resort and the Rainforest Aerial Tram for bird watching. They offer transportation for their patrons, and many tours are run to Cartago and Irazu every day. Outside businesses also pick up patrons at the hotel. The Aurola Holiday Inn would be interested in carrying pamphlets that discuss a bird watching program at Lankester.

Don Carlos, San Jose

The high season at this hotel is the first fifteen days of December, and May through August. Business drops off in early September. The occupancy of the hotel in the low season is 40-50 percent. The hotel does no marketing beyond internet and phone book. The hotel is found in many guide books. The service and reputation of the hotel brings people in. The hotel has its own tourist agency. The agency is open to the public, as well. Louis Carlos Palazuelos, a tourist agent at Don Carlos, says that tourists are not looking for specifics. Most of them, he says, have itineraries. He says that there is a demanding bird watching program at San Gerado de Dota. The hotel supplies airport to

hotel transportation. They recommend that their patrons take a tour with a guide rather than going on their own. The hotel is also an intermediate for a car rental agency. Palazuelos asserts that the hotel's tourist agency would definitely be interested in a bird watching program at Lankester Garden. He says that they are open to new things and that people comment that the same things are always seen and offered. People read guide books and follow what they say. It is difficult to introduce a new product because of this trend, he says. Guide books are not updated yearly and new programs are often over looked for some time. Palazuelos recommends e mailing the guide book publishers and letting them know about the new program.

Grano de Oro, San Jose

The high season of this hotel is November through March. The hotel does not market to those interested in nature. Just a few patrons are interested in bird watching at this hotel. The hotel has its own van and will transport patron to the destination of their choice, including Cartago. Outside businesses also pick up people from this hotel. The Grano de Oro would be interested in carring pamphlets on Lankester's bird watching program.

Hostel Toruma, San Jose

This hostel attracts ten to eleven thousand patrons per year. The high season is from June to August and from December to March. The hostel markets mainly to students. The hostel offers transportation to popular areas such as Volcan Arenal and

Irazu. No outside businesses pick up patrons from the hostel. Anyone is allowed to leave pamphlets in the lobby.

Hotel Aloki, San Jose

The high season at this hotel is November through April. The hotel markets to all groups of people, including students, the middle aged and seniors. At the present, they offer no pamphlets that discuss bird watching opportunities. The hotel offers transportation to the airport and anywhere patrons desire. The transportation goes to Cartago but not frequently. Specialty tours pick up patrons at this hotel. Hotel Aloki would be interested in carrying pamphlets on Lankester's bird watching program.

Hotel Aranjuez, San Jose

This hotel attracts approximately 16,425 patrons per year. The prime times for tourists are July through August and December through April. The hotel markets to those with a medium budget and attracts a lot of backpackers. No transportation is provided by the hotel. Outside businesses do pick up patrons at the hotel and travel to places like Tortuguero, volcanos and national parks.

Hotel Brittania, San Jose

Approximately 11,000 people stay at this hotel per year. The prime time for tourists is November through March. The hotel is located in a central downtown location and markets to all tourists. When the hotel has the information desired by tourists, they make it available. If they do no, they call a tourist agency for the patron. The hotel does

not have its own transportation. They arrange transportation for their patrons through taxis, tourist agencies and rental companies. It is most common for outside businesses to pick up patrons at the hotel. The Hotel Brittania would be interested in carrying pamphlets on a bird watching program at Lankester.

Hotel Edelweiss, San Jose

The high season at this hotel is November through April. It does not specifically market to those interested in nature and do not have any pamphlets on bird watching programs at present. The hotel does not offer transportation for its patrons. The hotel works with travel agencies, which pick up patrons at the hotel. Because people sometimes ask about bird watching programs, the Hotel Edelweiss would be interested in carrying pamphlets on Lankester's bird watching program.

Pension de La Cuesta, San Jose

The prime time for tourists at this hotel is December through April. The hotel makes available to their patrons information on Costa Rican tours. At present, they do not have any pamphlets on bird watching programs. Tourist agencies pick up patrons at this hotel. Pension de La Cuesta would be interested in carrying pamphlets on a bird watching program at Lankester.

Villa Tournon, San Jose

The high season for tourists at this hotel is December through March. The hotel has its own travel agency and will provide information on nature travel for interested

guests. They have pamphlets that advertise bird watching programs. The hotel does not offer transportation for their patrons and no outside businesses pick up guests from this hotel. Villa Tournon would be interested in carrying pamphlets on Lankester's bird watching program.

Transportation Companies

Automarcantil, San Jose

Mercedes offered two different model minibuses that accommodated fifteen passengers. The first was the Sprinter and it retailed for $35,000. It comes in two different models with one having a higher roof then the other. The second minibus that is sold by Mercedes is the MB-140 and it retails for $31,000. Neither minibus was available with a payment plan. A standard parts and labor warranty is included. The warranty is for two years or 50,000 kilometers. In addition there are several mandatory checkups required by the warranty.

Toyota, San Jose

Toyota offers only one fifteen-passenger minibus, called the Hiace 15, which retails for $23,500. The company offers a 60-month payment plan with 13 percent interest and a 30 percent down payment. There is a standard warranty included with the Hiace. The warranty is a parts and labor warranty for three years or 100,000 kilometers. The warranty requires regularly scheduled checkups.

Kia, San Jose

Kia offers a fifteen-passenger minibus called the Pregao. The Pregao costs $17,000, and offers a 48-month payment plan at 13 percent interest and a 30 percent down payment. The Pregao offers a similar warranty to the Hiace, which is a standard parts and labor warranty that is for three years or 100,000 kilometers. The warranty requires checkups at 1,000 km, 5,000 km, 10,000 km, and every 5,000 km after 10,000. This was the only auto dealership to give an estimate on yearly service costs and lifetime of the minibus. The Kia dealership estimated that the Pregao used for a regular daily tourist route would last approximately five years and cost $500 per year for maintenance.

Ford, San Jose

Ford offers a minibus called the E-350 Clubwagon. The E-350 Clubwagon costs $33,000 with a 60-month payment plan with 11 percent interest and a 30 percent down payment. The standard warranty is a parts and labor warrant for two years or 50,000 kilometers with regular service visits required.

Hyundai, San Jose

Hyundai offers the H-1 as the only minibus it currently has in stock. In late July Hyundai will also offer a new minibus called the Trajet. The Trajet as of yet has no available price information. The H-1 is available now and retails for $18,000 with a forty-eight-month payment plan at 16 percent interest and a 30 percent down payment.

Mazda, San Jose

Mazda offers the 2200 model minibus for fifteen passengers retailing at $23,500. The standard warranty includes parts and labor for three years or 100,000 kilometers. The usual payment plan is a forty-eight-month plan that is 14 percent interest and a 30 percent down payment.

Dollar Car Rentals, San Jose

Dollar offers a Mazda M4 Van for rent at $65 per day. The price of insurance is $15 per day with no cost per kilometer of use.

Thrifty Car Rentals, San Jose

Thrifty offers a Mazda 2200 Minibus for rent at $70 per day. The price includes insurance with no extra charge per kilometer of use.

Budget Car Rentals, San Jose

Budget offers a Hyundai PB for rent at $95 per day. The price of insurance is $15 per day with a cost of 12 cents per kilometer of use.

Avis Car Rentals, San Jose

Avis offers a Mazda M4 Van for rent at $75 per day. The price of insurance is included with no extra cost per kilometer of use.

Alamo Car Rentals, San Jose

Alamo offers a Mazda M4 Van for rent at $75 per day. The price of insurance is $20 per day with no extra charge per kilometer of use.

National Car Rentals, San Jose

National offers a Toyota Hiace for rent at $86 per day. The price of insurance is included in the total price with no extra cost per kilometer of use.

Hertz Car Rentals, San Jose

Hertz offers a Hyundai Galloper for rent at $75 per day. The price of insurance is $22 per day with a cost of 31 cents per kilometer of use.

Toyota Car Rentals, San Jose

Toyota offers a Toyota Hiace for rent at $89 per day. The price of insurance is $15 per day with no extra charge per kilometer of use.

Appendix D. Collection of Pamphlet Distribution Locations

Tourist Agencies

Baula Tours S.A.

San Jose, Calle 7, Avenida 1, door 31

Cosmos Tours

600m west of Taco Bell, San Pedro

Horizontes Nature Travel

1.5 blocks north of Pizza Hut, west side, Paseo Colon

Kapi Tours

Paseo Colon; Calles 34 & 36

Hotels

Aurola Holiday Inn

Avenida 5 and Calle 5

Don Carlos

Avenida 9 and Calle 9

Grano de Oro

Calle 30, between Avenidas 2 and 4

Hostel Toruma

Avenida Central, Calles 29 and 31

Hotel Aranjuez

Calle 19, between Avenidas 11 and 13

Hotel Brittainia

Calle 3 and Avenida 11

Hotel Edelweiss

Avenida 9, Calle 15; Barrio Otoya

Pension del la Cuesta

Avenida 1, between Calles 11 and 15

Villa Tournon

Barrio Tournon, Apdo. 6606-1000

Language Schools

Primary Distribution Sites:

Centro Linguista Conversa

Calles 37 and 38

Central American Institute for International Affairs

Barrio Otoya Avenida 11, Calles 13 and 15

Instituto for Latinoamericano de Idiomas

400 meters south and 50 meters east of the San Pedro Church

Secondary Distribution Sites:

Centro Linguista Latin America

San Antonio de Belen, 200 meters west and 100 meters north of Iglesia Catholica

Centro Cultural Costarricense Norteamerica

Los Yoses, Avenida 1 and 5, Calle 37

Forrester Instituto Internaccional

Los Yoses, 75 meters south of Automercado

Intensa

Avenida 5 and 7, Calle 33

Instituto Universal de Idiomas

Avenida 2, Calle 9

Institute for Central American Developmental Studies

400 meters east of Plaza del Sol

Other

Juan Santamaria International Airport

ICT desk at International Arrivals Terminal

Appendix E. List of Plants That Aid in the Attraction of Birds

Latin Name	Common Spanish Name
Acnistus arborescens	Guitite
Alchornea costarricensis	Fosforillo
Ardisia spp	Tucuico
Calliandra confusa	Carboncillo
Cecropia spp	Guarumo
Cestrum spp	Zorrillo
Citharexylum caudatum	Dama
Cordia glabra	Muneco
Croton spp gossypiifolius	Taigua
Dendropanax arboreus	Fosforillo-cacho de venado
Erythrina spp	Poro
Eugenia	Murta
Ficus spp	Higueron
Hamelia patens	Vainillo
Heliconia spp	Platanillas, heliconias
Hibiscus rosa-sinensis	Clavelon
Igna spp	Guaba, cuajiniquil
Malvaviscus arboreus	Amapola
Mauria etherophyla	Cirri
Myrsia sp	Murta
Miconia spp	Lengua de vaca
Oreopanax xalapensis	Cacho de venado
Phoebe mexicana	Aguacatillo
Psidium guajaba	Guayaba
Rapanea myricoides	Ratoncillo
Spondias purpurea	Jocote
Stachytarpheta jamaicensis	Rabo de Zorro
Trema micrantha	Capulin

Appendix E

Latin Name	**Common Name**
Trichilia habanensis (T. glabra)	Uruca

Appendix F. Birds Found at Lankester Botanical Garden

Latin Name	Common English Name
Podilymbus podiceps	Pied-Billed Grebe
Tachybaptus dominicus	Least Grebe
Nycticorax nycticorax	Black-Crowned Night Heron
Nyctanassa violacea	Yellow-Crowned Night Heron
Bubulcus ibis	Cattle Egret
Butorides virescens	Green-Backed Heron
Egretta caerulea	Little Blue Heron
Egretta thula	Snowy Egret
Casmerodius albus	Great Egret
Ardea herodias	Great Blue Egret
Dendrocygna autumnalis	Black-Bellied Whistling-Duck
Anas discors	Blue-Winged Teal
Anas clypeata	Northern Shoveler
Aythya affinis	Lesser Scaup
Oxyura dominica	Masked Duck
Cathartes aura	Turkey Vulture
Coragyps atratus	Black Vulture
Pandion haliaetus	Osprey
Chondrohierax uncinatus	Hook-Billed Kite
Elanus leucurus	White-Tailed Kite
Accipiter straitus	Sharp-Shinned Hawk
Buteo platypterus	Broad-Winged Hawk
Buteo brachyurus	Short-Tailed Hawk
Buteo albonotatus	Zone-Tailed hawk
Falco sparverius	American Kestrel
Dendrortyx leucophrys	Buffy-Crowned Wood-Partridge
Colinus leucopogon	Spotted-Bellied Bobwhite
Pardirallus maculates	Spotted Rail

Latin Name	Common English Name
Porzana carolina	Sora
Porzana flaviventer	Yellow-Breasted Crake
Laterallus albigularis	White-Throated Crake
Gallinula chloropus	Common Gallinule
Porphyrula martinica	Purple Gallinule
Fulica americana	American Coot
Jacana spinosa	Northern Jacana
Charadrius vociferous	Killdeer
Tringa flavipes	Lesser Yellowlegs
Tringa solitaria	Solitary Sandpiper
Actitis macularia	Spotted Sandpiper
Calidris mauri	Western Sandpiper
Calidris minutilla	Least Sandpiper
Calidris melanotos	Pectoral Sandpiper
Columba livia	Rock Dove
Columba flavirostris	Red-Billed Pigeon
Zenaida macroura	Mourning Dove
Columbina talpacoti	Ruddy Ground Dove
Columbina inca	Inca Dove
Leptotila verreauxi	White-Tipped Dove
Aratinga finischi	Crimson-Fronted Parakeet
Pionus senilis	White-Crowned Parrot
Coccyzus americanus	Yellow-Billed Cuckoo
Piaya cayana	Squirrel Cuckoo
Crotophaga sulcirostris	Groove-Billed Ani
Tyto alba	Common Barn-Owl
Otus choliba	Tropical Screech-Owl
Glaucidium brasilianum	Ferruginous Pygmy-Owl
Asio clamator	Striped Owl

Latin Name	Common English Name
Nyctidromus albicollis	Common Pauraque
Streptoprocne zonaris	White-Collared Swift
Chaetura vauxi	Vaux's Swift
Campylopterus hemileucurus	Violet Sabrewing
Amazilia saucerrottei	Steely-Vented Hummingbird
Amazalia tzacatl	Roufus-Tailed Hummingbird
Selasphorus scintilla	Scintillant Hummingbird
Trogon collaris	Collared Trogon
Ceryle torquata	Ringed Kingfisher
Chloroceryle amazona	Amazon Kingfisher
Chloroceryle americana	Green Kingfisher
Momotus momota	Blue-Crowned Motmot
Melanerpes hoffmannii	Hoffmann's Woodpecker
Piculus rubiginosus	Golden-Olive Woodpecker
Lepidocolaptes souleyetii	Streaked-Headed Woodcreeper
Thamnophilus doliatus	Barred Antshrike
Tityra semifasciata	Masked Tityra
Sayornis nigricans	Black Phoebe
Tyrannus melancholicus	Tropical Kingbird
Legatus leucophaius	Piratic Flycatcher
Megarhynchus pitangua	Boat-Billed Flycatcher
Myiodynastes luteiventris	Sulphur-Bellied Flycatcher
Myiodynastes maculatus	Streaked Flycatcher
Myiozetetes similis	Social Flycatcher
Pitangus sulphuratus	Great Kiskadee
Myiarchus tuberculifer	Dusky-Capped Flycatcher
Contopus sordidulus	Western Wood-Pewee
Empidonax virescens	Acadian Flycatcher
Empidonax alnorum	Alder Flycatcher

Latin Name	Common English Name
Empidonax albigularis	White-Throated Flycatcher
Tolmomyias sulphurescens	Yellow-Olive Flycatcher
Todirostrum cinereum	Common Tody-Flycatcher
Elaenia flavogaster	Yellow-Bellied Elaenia
Elaenia chiriquensis	Lesser Elaenia
Zimmerius vilissimus	Mistletoe Tyrannulet
Progne chalybea	Gray-Breasted Martin
Hirundo pyrrhonota	Cliff Swallow
Hirundo rustica	Barn Swallow
Stelgidopteryx rificollis	Southern Rough-Winged Swallow
Stelgidopteryx serripennis	Northern Rough-Winged Swallow
Notiochelidon cyanoleuca	Blue-and-White Swallow
Riparia riparia	Bank Swallow
Tachycineta bicolor	Tree Swallow
Cyanocorax morio	Brown Jay
Cistothorus platensis	Sedge Wren
Thryothorus modestus	Plain Wren
Troglodytes aedon	House Wren
Henicorhina leucosticta	White-Breasted Wood-Wren
Dumetella carolinensis	Gray Catbird
Turdus grayi	Clay-Colored Robin
Hylocichla mustelina	Wood Thrush
Catharus ustulatus	Awainson's Thrush
Catharus aurantiirostris	Orange-Billed Nightingale-Thrush
Bombycilla cedrorum	Cedar Waxwing
Ptilogonys caudatus	Long-Tailed Silky-Flycatcher
Vireo flavifrons	Yellow-Throated Vireo
Vireo olivaceus	Red-Eyed Vireo
Vireo flavoviridis	Yellow-Green Vireo

Latin Name	Common English Name
Mniotilta varia	Black-and-White Warbler
Protonotaria citrea	Prothonotary Warbler
Helmitheros vermivorus	Worm-Eating Warbler
Vermivora chrysoptera	Golden-Winged Warbler
Vermivora peregrina	Tennessee Warbler
Dendroica petechia	Yellow Warbler
Dendroica virens	Black-Throated Green Warbler
Dendroica fusca	Blackburnian Warbler
Dendroica pensylvanica	Chesnut-Sided Warbler
Seiurus aurocapillus	Ovenbird
Seiurus noveboracensis	Northern Waterthrush
Oporornis formosus	Kentucky Warbler
Oporornis philadelphia	Mournung Warbler
Geothlypis poliocephala	Gray-Crowned Yellowthroat
Wilsonia pusilla	Wilson's Warbler
Wilsonia canadensis	Canada Warbler
Setophage ruticilla	American Redstart
Basileuterus rufifrons	Rufous-Capped Warbler
Psarocolius montezuma	Montezuma Oropendola
Amblycercus holosericeus	Yellow-Billed Cacique
Scaphidura oryzivora	Giant Cowbird
Molothrus aeneus	Bronzed Cowbird
Dives dives	Melodious Blackbird
Quiscalus mexicanus	Great-Tailed Grackle
Icterus spurius	Orchard Oriole
Icterus galbula	Northern (Baltimore) Oriole
Sturnella magna	Eastern Meadowlark
Euphonia elegantissima	Blue-Hooded Euphonia
Thraupis episcopus	Blue-Gray Tanager

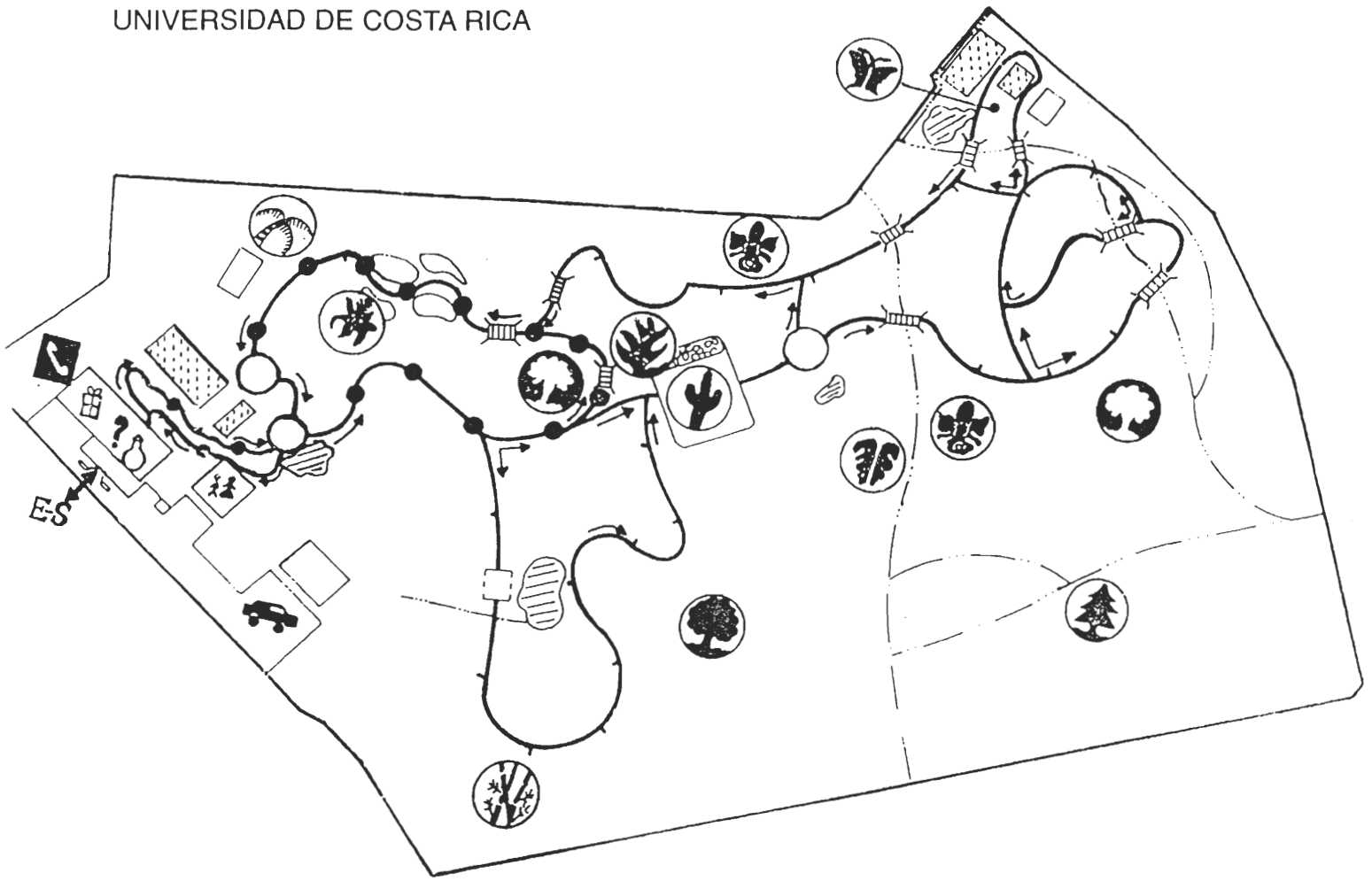
Latin Name	**Common English Name**
Thraupis palmarum	Palm Tanager
Ramphocelus passerinii	Scarlet-Rumped Tanager
Piranga olivacea	Scarlet Tanager
Saltator atriceps	Black-Headed Saltator
Saltator maximus	Buff-Throated Saltator
Saltator coerulescens	Grayish Saltator
Pheucticus ludovicianus	Rose-Breasted Grosbeak
Passerina cyanea	Indigo Buntinng
Tiaris olivacea	Yellow-Faced Grassquit
Sporophila torqueola	White-Collared Seedeater
Sporophila aurita	Variable Seedeater
Sporophila nigricollis	Yellow-Bellied Seedeater
Volatinia jacarina	Blue-Black Grassquit
Atlapetes gutturalis	Yellow-Throated Brush-Finch
Melozone leucotis	White-Eared Ground-Sparrow
Zonotrichia capensis	Rufous-Collared Sparrow
Passer domesticus	House Sparrow

Appendix G. Location of Bird Species at Lankester Botanical Garden

Location	Species
Heliconias	Hummingbirds, White-Crowned Parrot, Crimson Fronted Parakeet, Clay-Colored Robin
Secondary Forest	Scaled Antpitta, White-Breasted Wood Wren Eye-Ringed Flatbill, Orange-Billed Nightingale Thrush, Montezuma Oropendola, Yellow-Olive Flycatcher, Red-Billed Pigeon
Natural Forest in Recuperation	Rufous-Capped Warbler, Atlapetes albinucha, White-Eared Ground Sparrow, Plain Wren, Smoky-Brown Woodpecker, Buff-Throated Saltator, Grayish Saltator
Pond	Green-Backed Heron, Black-Bellied Whistling Duck, White-Throated Crake, Clay-Colored Robin
Palms	Clay-Colored Robin, Streaked-Headed Woodcreeper (also in conifers)
Cacti	House Wren, Clay-Colored Robin
Bromeliads	Scaled Antpitta, White-Eared Ground Sparrow, Clay-Colored Robin

JARDIN BOTANCO LANKESTER

UNIVERSIDAD DE COSTA RICA



AREAS DEL JARDIN

- Bambúes (*Bamboo*)
- Bosque Natural en Recuperación (*Natural Forest in recuperation*)
- Cactus (*Cacti*)
- Aráceas y Marantáceas (*Araceae and Marantaceae*)
- Bosque Tropical Secundario (*Secundary Tropical Forest*)
- Orquídeas (*Orchids*)
- Heliconias (*Heliconias*)
- Bromelias (*Bromeliads*)
- Palmas (*Palms*)
- Coníferas (*Conifers*)
- Mariposas (*Butterflies*)

Appendix H. Proposal From Costa Rica's Temptations

Costa Rica's Temptations
TEL: (506) 220-4437 / FAX: (506) 220-2792 / email: reserv@crtinfo.com

Number of pages including this cover sheet (3)

TO/A: Lankaster Botanical Gardens// Aten: Mr. David Cooney
DE/FROM: Marcela Mejía/ Reservations Supervisor **Date: Jun 22,2000**
REF: Service agreement proposal

Greetings from Costa Rica's Temptations!

Dear Mr. Cooney:
Good morning!
First of all, I would like to introduce my self. My name is Marcela Mejía, I am the reservations supervisor. Miss. Sussy Sequeira our San Jose office manager designate me your inquires. It is my pleasure to assist you.

As per your meeting with Sussy, CRT will offer you the following options for your Bird Watching tour at the Lankester Botanical Gardens:

Exclusive Rates are valid until April 3, 2001

Transportation/ Rates per service

Cost per service:	$85.00
Bilingual Naturalistic guide per tour:	**$50.00**

Rates per person

Lankester entrance fee	$5.00
Lunch – rate per person	**$12.00**

The minimum of participants per tour are two people

In order to inspire client's interest, we can offer you two alternatives for the tour. One visiting the Orosi Valley and the other just visiting the gardens and Cartago's main attractions.

Moreover, it is very important to mention that the suggested tours include an experienced bilingual naturalist guide and the vehicles are Toyota Hi-Ace or similar 99-00 all of them are air-conditioned.

Bird Watching Tour & Orosy Valley

Route:

5:00 am San Jose (Departing from downtown properties)
6:00 am Lankester Gardens Bird Watching Tour (Entrance fee included)
9:30 am Departure to Paraiso visiting the Orosi Valley. Arrival at Paraíso and lunch in a local Restaurant.
11:00 am Continue to Cartago City's main attractions (Basilica de Los Angeles & Ruin's of Cartago)
12:00 pm Departure on transfer back to hotels in San Jose
Note: The approximate pick up time at San Jose properties is at 5:00 am. These times may vary depending on the number of participants and the hotel's location.
Length of tour: 7 hours
Includes: Naturalist bilingual guide, transportation, entrance fee to Lankester Botanical Gardens, visit to Orosi's church and brunch.

Rates per person // Minimum 2 participants
Valid until April 30, 2001

Number of Participants	Rack	Net
2-4 pax	$100.00	**$84.50**
5-7 pax	$50.00	**$44.00**
8-10 pax	$38.00	**$34.50**

Menu Option:

Entree
Potato Cream Soup
Fruit Drink

From the buffet
Grill Chicken Fajitas
Sirloin Steak
Grill Sea Bass

All the above options come with: Steam vegetables, mash potatoes and dinner bread.

Desert
Ice cream cup with cocktail fruit.
Coffee .
All other beverage are not included in the above menu and will be charge separately.

Bird Watching Tour

Route:

5:00 am San Jose (Departing from downtown properties)

6:00 am Lankester Gardens Bird Watching Tour (Entrance fee included)
9:30 am Departure for brunch at "La Casona del Cafetal" Restaurant located in Cachi.
11:00 am Continue to Cartago City's main attractions (Basilica de Los Angeles & Ruin's of Cartago)
12:00 pm Departure on transfer back to hotels in San Jose
Note: The approximate pick up time at San Jose properties is at 5:00 am. These times may vary depending on the number of participants and the hotel's location.
Length of tour: 7 hours
Includes: Naturalist bilingual guide, transportation, entrance fee to Lankester Botanical Gardens and brunch.

Rates per person // Minimum 2 participants
Valid until April 30, 2001

Number of Participants	Rack	Net
2-4 pax	$100.00	**$84.50**
5-7 pax	$50.00	**$44.00**
8-10 pax	$38.00	**$34.50**

Menu Option
Drinks:
Fruit drinks (Tropical Fruits)

Entree
Green Salad

From the Buffet
La Casona del Cafetal Dish with the option of:
- Chicken
Sea Bass
- Sirloin
All the above options come with: Whit Rice, beans , vegetables , cheese and sweet plantains.

Desert:
Coffee Custard
Coconut Custard

All requests and reservations must be received in writing by fax (506) 220-2792 or e-mail to the following address: reserv@crtinfo.com. Costa Rica's Temptations requires 48 hours maximum period of written notification.

We hope this information will be useful for you. In case you require further details, do not hesitate to contact us. We will be glad to assist you.

Kind regards.

Marcela Mejia
Reservations Supervisor.

Appendix I

Birders' Exchange

getting tools to people who need them

Birders' Exchange is a co-operative program of the Manomet Center for Conservation Sciences and the American Birding Association

Dear Colleague:

The American Birding Association and the Manomet Center for Conservation Sciences are coordinating the efforts to collect used research equipment and books for donation to environmental groups in Latin America, and the Caribbean. This project, called the BIRDERS' EXCHANGE, has two primary goals: 1) to provide material support to organizations involved in research, conservation, or public education work related to birds and their habitats, and 2) to increase the flow of information about bird conservation efforts between grassroots organizations throughout the Western Hemisphere.

The BIRDERS' EXCHANGE is accepting requests for material assistance. As a result of donations from North American bird clubs, the following materials are available:

* binoculars (used, but in good condition)
* spotting scopes with tripods (numbers very limited)
* field guides and ornithological reference books

Requests for other types of research and education equipment, such as laptop computers, cameras, slide projectors, back packs, etc., are also accepted. If we do not currently have the equipment or books you request, we will try to find a donor.

Guidelines for applying to the BIRDERS' EXCHANGE are enclosed. Preference will be given to organizations engaged in research or conservation work on migrant or resident birds, preservation of habitats important to birds, or education efforts designed to increase public appreciation of birds and bird conservation. Because of the logistical problems of equipment delivery, your organization's ability to help arrange for delivery of materials will be considered in our evaluation of your proposal.

Because one of the goals of the BIRDERS' EXCHANGE is to increase the available information about existing bird conservation efforts, groups requesting assistance from the Exchange are encouraged to provide photographs or printed materials describing their work. These materials will prove valuable in our efforts to inform the North American public about the significant research and conservation work being undertaken by Latin American groups, and will assist us in soliciting further donations to the Birders' Exchange.

We hope to hear from you.

Bettty Petersen
Program Director
Manoment Center for Conservation Sciences

Lina DiGregorio
Program Director
American Birding Association

Betty Petersen, Program Director
Manomet Center for Conservation Sciences
81 Stage Point Road, PO Box 1770,
Manomet, MA 02345

Ph: 508 224 6521
Fax: 508 224 9220
Email: bpetersen@manomet.org

Birders' Exchange Advisors:
Greg Butcher, Donald Dann, Pete Dunne, John Kricher, Donald Stokes, Lillian Stokes

Web page:
www.americanbirding.org/consbex.htm

Lina DiGregorio, Program Director
American Birding Association
720 West Monument Street, PO Box 6599,
Colorado Springs, CO 80934

Ph: 719 578 9703
Fax: 719 578 1480
Email: edcon@aba.org

Appendix I

BIRDERS' EXCHANGE

APPLICATION GUIDELINES

1. Fill out BIRDERS' EXCHANGE application form.

2. Write a 1 - 3 page proposal (in English or Spanish) that addresses the following points:
    a. Provide a brief history of your organization or project. When and why was it formed? How many paid and/or volunteer employees are on your staff? Are you a registered, and/or tax exempt organization?

    b. Describe your organization's current activities, in terms of research, education, or conservation. How does your organization work to preserve migrant and resident birds and/or their habitats? If you are an academic researcher or student, describe your project, why it is important to bird conservation, and what new information it will provide. (If you wish, include résumés of appropriate researchers or staff.)

    c. What are the specific needs of your organization or project in terms of research equipment, field guides, reference books, or journals? Explain specifically why the materials are needed, how they will be used, and how many people will be using them. If more than one item is requested, rank the items in terms of importance to your project.

3. Provide names, addresses, and phone numbers of one or more references who are familiar with your organization or research project. Students should include a letter of recommendation from their academic advisor.

4. Organizations that receive equipment or funds through the Manomet/ABA BIRDERS' EXCHANGE are required to provide a follow-up report on their activities 6 months after receiving the materials. This report should detail how the equipment has been used, whether it performed satisfactorily, and how many people used it.

5. Photographs (slide or B&W print) depicting your organization's activities or staff, or printed materials describing your organization's work, will greatly help Manomet and ABA to publicize the work of your organization and to solicit future donations from North American bird watchers. If you are able to provide us with these materials, please include them with your proposal. We cannot guarantee the return of photographs.

IMPORTANT Please advise us on the best way to deliver valuable materials (such as binoculars) to your organization. Be as detailed as possible. Your ability to help arrange for delivery of materials will effect our evaluation of your proposal. Do you have contacts with the U.S. embassy in your country, or with local offices of international conservation organizations or multinational corporations that could help to facilitate delivery? Let us know if representatives of your organization will be traveling to the U.S. or if you know of U.S. researchers who may be traveling to your area who can act as couriers.

Appendix I

BIRDERS' EXCHANGE

APPLICATION FORM

Organization Name:_____

Project Names:_____

Principal Investigator_____

Official Contact Person:_____

Address:_____

_____

City:_____

State:_____

ZipCode:_____Country_____

Telephone:_____

Fax:_____

Email:_____

Website:_____

Briefly describe the type and amount of equipment you are requesting (In order of priority):

_____

_____

_____

_____

What is the best method of sending valuable materials to your organization ?

_____

_____

_____

_____

Proposals or inquiries should be sent to:

Birders' Exchange
American Birding Association
PO Box 6599
Colorado Spring, CO 80934
USA

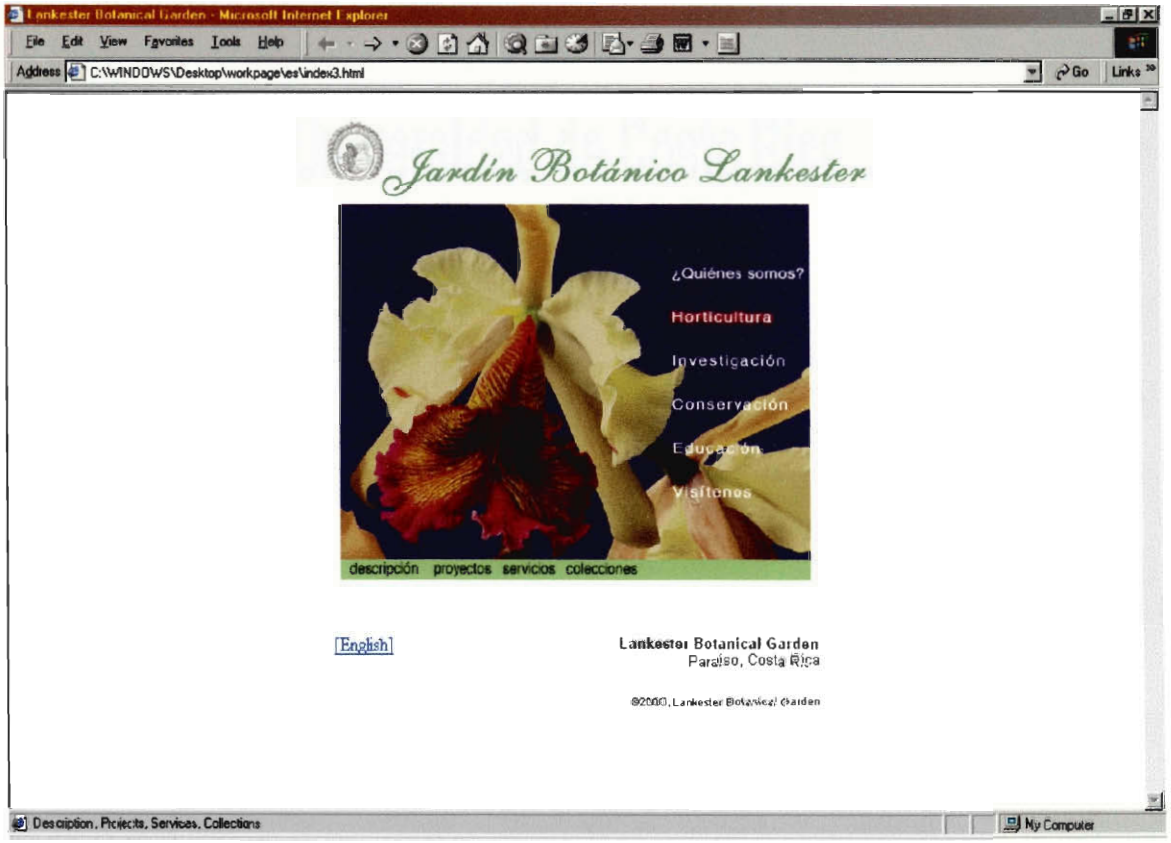
fax: 719-578-1480

Appendix J. Web Site Design and Maintenance

In the course of this project, our group implemented a web site for Lankester Botanical Garden. The design philosophy and information for upkeep of the site are discussed in this section.

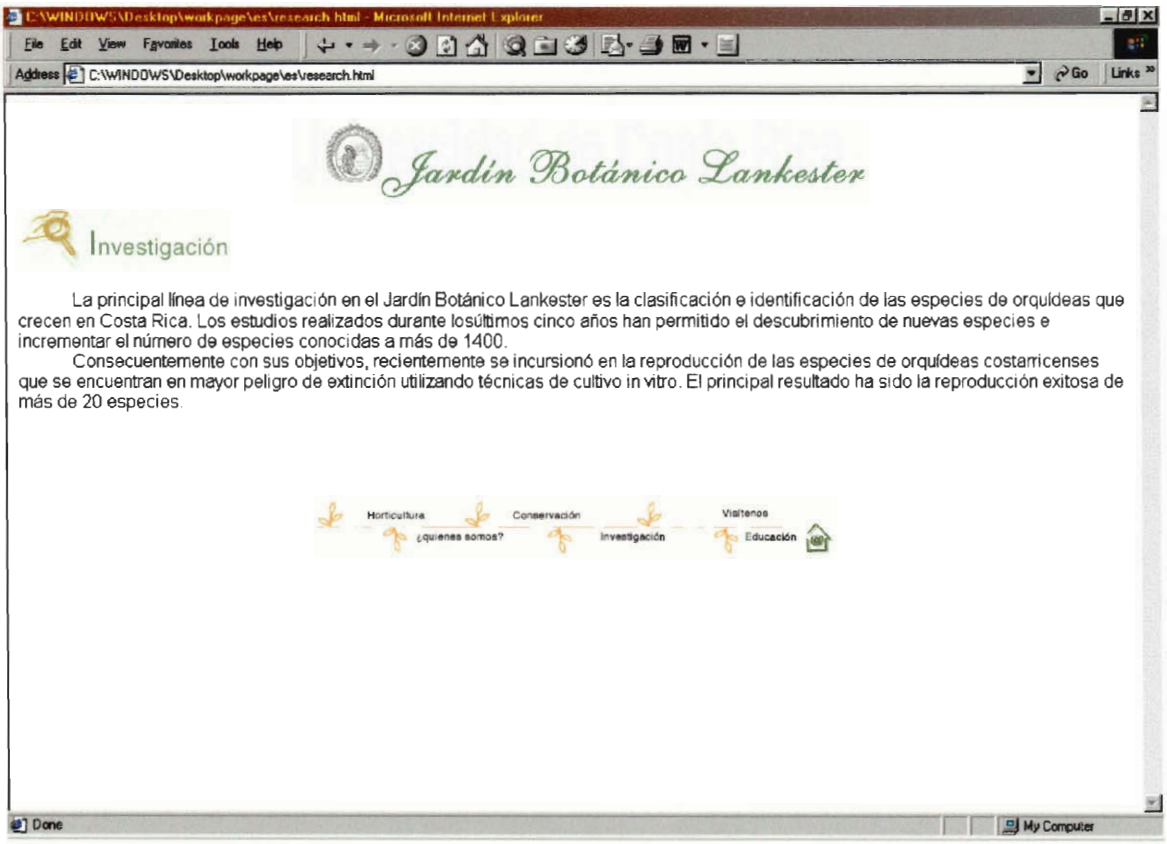
The design of this site took many factors into consideration. We wanted the site to provide educational material, information for tourists, and news related to the garden. In addition to these needs, we believed that the site should be attractive and fun for the user. Because no employees of the garden are qualified to create web pages, we felt that the site should be simple enough to be maintained by garden staff. The final design achieves these goals through a variety of methods.

As the web site needed to present a large quantity of diverse information, a logical partitioning of this information was necessary for ease of representation and location by the user. As Schneiderman mentioned (see Literature Review), the optimal number of categories to divide information into for ease of use is effectively six. Following this advice, we divided the information into six categories, all accessible from an attractive and useful main menu, as shown in the screenshot on the following page. The menu was made to be entertaining: the buttons light up as the mouse pointer moves over them and a different picture of a flower is randomly selected each time the main page is loaded (four different and attractive menus in all). To aid the user in quickly and efficiently locating the desired information, subcategories of the topics shown on the buttons are also displayed as the mouse pointer moves over them. These subcategories are visible at the bottom of the menu in the screenshot.



Because the web site was aimed at an international and local audience, all menus and pages are provided in both English and Spanish. To the lower left of the menu, an additional button is provided, which loads the English language version of the menu.

The screenshot below is an example of an average page on this site.



Each page on the site contains the logo of the garden, a graphic that indicates the section of the site that the page represents, and a small menu at the bottom. The menu at the bottom contains links to all six main sections of the site, as well as a button that will return the user to the main menu. The key feature of these pages is the simplicity of maintenance. Each of these pages can be edited easily with Microsoft Word, although the main menu cannot be easily changed.

Appendix J

For the benefit of the garden's staff, a list of the files that can be easily edited has been included below:

conserv.html - Contains the "conservation" page

research.html – Contains the "research" page

educat.html – Contains the "education" page

visitor.html - Contains the "visitor information" page

hort.html – Contains the "horticulture" page

about.html - Contains the "about us" page

orchid.html - Contains the "orchids" page

Please remember that there are two sets of these files, one set in English and one in Spanish. The English-specific files are in the /en/ directory, and the Spanish-specific files are in the /es/ directory.

Bibliography

Audubon. (April 20, 2000). Audubon Online. National Audubon Society, Inc.

Baker, C.P. (1996). Costa Rica handbook. Chico, CA: Moon Publications, Inc.

Barrett, N. (1997). Advertising on the internet. London: Kogan Page Ltd.

Blake, Beatrice, and Becher, Anne. (1999) The new key to Costa Rica Berkely, CA: Ulysses Press.

Boo, E. (1990). Ecotourism: The Potentials and Pitfalls. Washington D.C.: World Wildlife Fund.

Brimson, J. A. (1991). Activity accounting. New York: John Wiley and Sons, Inc.

Broad Meadow Brook Conservation Center and Wildlife Sanctuary. "Newsletter". (May-August 2000). Worcester, MA.

Broad Meadow Brook Conservation Center and Wildlife Sanctuary. "Newsletter". (January-April 2000). Worcester, MA.

Broad Meadow Brook Wildlife Sanctuary and Education Center. (ND). "Educational Services". Worcester, MA.

Dunlop, F. (1999). Fodor's exploring Costa Rica. New York: Fodor's Travel Publications, Inc.

"Call of the wild: ecotourism has become a mainstay of the travel biz. Now it has to see if it can stay true to its original objectives." Time, 154, 78B.

Cater, E. and G. Lowman. (1995). Ecotourism: A Sustainable Option?. New York: John Wiley & Sons, Inc.

Ellsworth, J. (1995). Marketing on the internet. New York: John Wiley & Sons.

Gunn, C. (1979). Tourism Planning. New York: Crane Russak.

Hausner, V. (1981). Creating Economic Growth and Jobs Through Travel and Tourism. Washington D.C.: U.S. Department of Commerce.

Honey, M.S. (1999). "Treading lightly?: ecotourism's impact on the environment". Environment, 41, 54.

Inskeep, E. (1991). Tourism Planning. New York: Van Nostrand Reinhold.

Janzen, D.H. (Ed.). (1983). Costa Rican natural history. Chicago: University of Chicago Press.

Marrus, S. (1984). Building the strategic plan. New York: John Wiley and Sons Inc.

Mieczkowski, Z. (1990). World Trends in Tourism and Recreation. New York: Peter Lang Publishing Inc.

O'Hara, P. (1995). The total business plan. New York: John Wiley and Sons Inc.

Rockwood, C. M. (Ed.). (1999). Costa Rica. New York: Fodor's Travel Publications, Inc.

Schneiderman, B. (1998). Designing the user interface reading. Massachusetts: Addison Wesley Longman, Inc.

Stewart, J. M. (1982). Cost Estimating. New York: John Wiley and Sons.

Stiles, F. G., Skutch, A. F. (1989). A guide to the birds of Costa Rica. Ithica: Cornell University Press.

Tanaka, M., Yoshikawa, T., Innes, J., & Mitchell, F. (1993). Contemporary cost management. New York: Chapman and Hall.

Weiler, B. and C.M. Hall. (1992) Special interest tourism. New York: John Wiley & Sons, Inc.