Guidelines for Sustainable Ecotourism in Monteverde, Costa Rica

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ABSTRACT

Tourists are increasingly attracted to the world’s natural wonders (Honey 1999). The Convention on Biological Diversity (CBD) recognized that tourism can also negatively impact the natural areas and formulated guidelines for the proper management of ecotourism. Costa Rican tourism has experienced a boom in the past two decades, and one of its most popular destinations is Monteverde, an area composed of many private reserves. Eleven of these reserves were investigated using the guidelines provided by the CBD. It was found that Monteverde’s private reserves followed some guidelines, such as offering local employment, local access to reserves and following good waste management. However, there is not enough monitoring of biodiversity on the part of the reserves, many reserves do not have rules or regulations for tourists to follow, and a lot of reserves do not offer environmental education programs or community outreach. This study recommends that each reserve make a permanent plan outlying how it will protect biodiversity in light of increased ecotourism.

RESUMEN

Turistas están sumamente atraídos a las maravillas naturales del mundo. La Convención de la Diversidad Biológica (CBD por sus siglas en inglés) reconoce que el turismo puede también impactar negativamente las áreas naturales y formular guías para el manejo adecuado del ecoturismo. El turismo en Costa Rica ha experimentado un incremento acelerado en las últimas dos décadas, y uno de los destinos más populares es Monteverde, un área compuesta principalmente por reservas privadas. Once de estas reservas fueron investigadas usando estas guías provistas por CBD. Se encontró que las reservas privadas de Monteverde siguen algunas de las pautas de estas guías, como ofrecer empleo a locales, acceso a la reserva por parte de locales y buen manejo de desechos. Sin embargo, no hay suficiente monitoreo de la biodiversidad en parte de las reservas, muchas de las reservas no tienen reglas que los turistas deben seguir, y muchas de las reservas no ofrecen programas de educación ambiental para las comunidades. Este estudio recomienda que cada reserva deba hacer un plan en como proteger la diversidad en vista al incremento del ecoturismo.

INTRODUCTION

Over the past fifteen years, ecotourism has become one of the fastest growing sectors of the tourism industry, growing three times faster than the industry as a whole (Blangy 2006). Tourism has increased by more than 100% between 1990 and 2000 in regions richest in species and facing extreme threats (Blangy 2006). In an era where we are losing biodiversity at alarming rates, it is important to understand how ecotourists are affecting the natural wonders they are increasingly drawn to visit.

Ecotourism in this paper shall be defined as travel to fragile, pristine, and usually protected areas to do such wildlife activities as hiking, canoeing, photography, and observing wildlife that do not involve the taking of wildlife. Most typically, ecotourism involves visits to areas that are under some form of environmental protection by governments, conservation or scientific organizations, or private owners or entrepreneurs (Honey 1999).
At best, ecotourism has the potential to protect natural, often fragile ecosystems from degradation, as well as provide economic support to local communities (Burnie 1994, Lundark 2002). In Latin America, scientists and environmental activists view ecotourism as a potential alternative to logging, drilling, mining, and other extraction industries (Brandon 1996). Ecotourism can help reduce deforestation and support conservation financially and thus can be very beneficial to conservation, especially in developing countries, which would otherwise depend on forests to make their living, through deforestation and subsistence agriculture (Burnie 1994).

However, the picture is more complex. Ecotourism has the potential to threaten the very ecosystems on which it depends (Blangy 2006, Honey 1999). The fast pace of tourism development around the world is causing untold damage to some of the most endangered ecological systems (Blangy 2006). Uncontrolled growth can increase stress on fragile ecosystems and accelerate and aggravate their depletion (Croall 1995, Drumm 2008, Green 1994, Park 1999, Vivanco 2002). In the Galapagos Islands, for example, park officials often complain of habitat fragmentation, stressed water supplies, litter, added air pollution and other problems associated with high ecotourist and tourist numbers (Vanasselt 2000). Research does show, however, that enhancing ecotourist understanding of threats to biodiversity and conservation helps stimulate their participation in philanthropic activities towards conservation (Powell 2008, Vanasselt 2000).

Ecotourism, when coupled with privately owned land, is rife with conflicts of interest and would benefit from outside monitoring and evaluation. This can be due to problems varying from excess visitation or reserve owners taking advantage of a region’s good conservation reputation, letting their habitat deteriorate while only protecting the small amount of land required to stage a nature walk (Lassoie 2001).

Costa Rica is a popular ecotourist destination, with just under two million visitors in 2007 and receives 1.9 billion dollars annually from tourism (generating more revenue than coffee, banana and pineapple industries combined) (Estado de la Nación website). There are 211 private reserves in Costa Rica covering ecologically important habitat, particularly primary rain forest (Langholz 2001). These reserves were found to protect key corridor and buffer zone areas between and around larger state parks (Langholz 2001). Principal problems found with private reserves were poaching of plants and animals, lack of government incentives, lack of information on government programs, and the monetary resources to protect the parks (Langholz 2001). Monteverde is home to the most famous of Costa Rica’s private reserves, the Monteverde Cloud Forest Reserve.

Because ecotourism can have both beneficial and negative impacts on biologically diverse and fragile ecosystems, I would like to investigate if and how ecotourism is effectively managed in private reserves. Costa Rica not only has extremely biodiverse nature destinations to offer, but also receives a large number of tourists, many of which are ecotourists, and provides an ideal location to conduct this research.

METHODS

The CBD Guidelines

Recognizing the costs and benefits of ecotourism to conservation of biodiversity, there have been efforts to manage ecotourism wisely, one of which is the Convention on Biological Diversity (CBD). The CBD is an international treaty to sustain the earth’s biodiversity and was
signed by one hundred and fifty government leaders at the 1992 Rio Earth Summit. In June 2001, experts from twenty-seven governments, the United Nations Environment Program (UNEP), the United Nations Educational, Scientific and Cultural Organization (UNESCO), non-governmental organizations as well as the private sector created the first draft of international guidelines for activities related to sustainable tourism development for vulnerable ecosystems. The CBD articulated what it perceives as the greatest threats of tourism on biodiversity and created guidelines for minimizing them (see Table 1).

The international guidelines of the CBD focus on the economic, environmental, and social impacts of ecotourism. I chose to focus on the environmental and social impacts. Table 1 includes a list of the CBD standards I chose to investigate for Monteverde and Table 2 has a list of potential negative environmental impacts of ecotourism defined by CBD. Although general, the CBD guidelines are the only set of international guidelines on ecotourism available, and therefore they are the guidelines I chose to use as a standard for my research.

Table 1. A summary of what the convention believes healthy management of ecotourism should entail.

<table>
<thead>
<tr>
<th>CBD Guidelines</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The encouragement of environmentally responsible behavior on the part of ecotourists</td>
</tr>
<tr>
<td>2</td>
<td>Good waste management of sewage and waste-water; chemical wastes, toxic substances and pollutants; and solid waste (garbage or rubbish). With an increased influx of people to an area comes increased waste, and if not well managed will be introduced into the natural environment.</td>
</tr>
<tr>
<td>3</td>
<td>Awareness-raising, information-sharing, education and training of ecotourism operators and their staff and sensitization of ecotourists on biological diversity issues</td>
</tr>
<tr>
<td>4</td>
<td>Tangible benefits to the local economies, such as job creation</td>
</tr>
<tr>
<td>5</td>
<td>Long-term monitoring and assessment, including the development and use of indicators to measure impacts of tourism on biological diversity and consequently to improve strategies and plans for tourism activities</td>
</tr>
<tr>
<td>6</td>
<td>Public education and awareness</td>
</tr>
<tr>
<td>7</td>
<td>Government monitoring of reserve policies</td>
</tr>
<tr>
<td>8</td>
<td>Affordable access to the reserve to locals/community members</td>
</tr>
</tbody>
</table>
Table 2. A summary of what CBD states to be potential negative impacts ecotourism on reserves.

<table>
<thead>
<tr>
<th>Potential Negative Environmental Impacts of Tourism</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pollution and production of greenhouse gases, resulting from travel by air, road, rail, or sea, at local, national and global levels</td>
</tr>
<tr>
<td>The extraction of groundwater by some tourism activities can cause desiccation, resulting in loss of biological diversity.</td>
</tr>
<tr>
<td>Noise</td>
</tr>
<tr>
<td>Disturbance of wild species, disrupting normal behavior and potentially affecting mortality and reproductive success</td>
</tr>
<tr>
<td>Extraction and use of building materials</td>
</tr>
<tr>
<td>Disposal of waste produced by the tourism industry may cause major environmental problems. The effect of direct discharge of untreated sewage leads to eutrophication, oxygen deficit and algal blooms.</td>
</tr>
</tbody>
</table>

In addition to the convention’s criteria found in the table, I wanted to investigate more closely problems specific to Costa Rica. These include illegal hunting and squatters as well as illegal deforestation by locals (Honey 2001, Lassoie 2001). Because ecotourist satisfaction is crucial to ensure that a reserve continue to receive high number of ecotourists and their potential donations (Powell 2009), I was also interested in how ecotourists feel. Management priorities are also important, as decision makers may be more interested in the economic gain from a park, and not its conservation benefits (Brandon 1996, Lassoie 2001). Because increased ecotourism also brings with it hotels and businesses whose practices might not always be environmentally friendly, contributing to pollution and waste problems, as well as misuse of local resources, I was interested in seeing how “green” ecotourists in Monteverde are.

Study Sites
One of the country’s leading destinations is biodiverse Monteverde, an area located in the Tilarán Mountains of Costa Rica and home to not only the country’s most famous private reserve, the Monteverde Cloud Forest Reserve, but to numerous other private reserves. Conservation in Monteverde began when Quaker immigrants set aside 554 hectares of virgin tropical forest in the 1950s to protect their watershed and buffer the force of wind on their pastures (Nadkarni and Wheelwright 2000). Originally, preservation in Monteverde was intended for research and protection, not tourism. Today, however, tourism plays a central role in this once secluded community. In 1974, when the reserve first opened, the area had a mere 471 visitors. In 2006, it was estimated that the Monteverde area received 216,000 visitors a year (Haley 2006). During the last half of the 1980s, tourism increased by 36 percent per year, and in the early 1990s, it grew at a rate of 50 percent per year (Honey 1999). Thus, Monteverde is a good example of an area rich in biodiversity, which has also experienced a rapid increase in tourism in the past decade.

Eleven private reserves varying in size in the Monteverde area were investigated in this project, covering 23,496 hectares of protected habitat. Bosque Eterno is a private company, with
conservation as its main mission. Its land is being used by the Monteverde Cloud Forest Reserve, which has recently begun to pay it rent for the use of the Bosque Eterno forest. Another conservation organization, the Monteverde Conservation League, owns the largest private reserve in the country, Bosque Eterno de los Niños. Smaller private reserves investigated include the Ecological Farm and Sendero Tranquilo. The Cloud Forest School, Biological Station, and University of Georgia Ecolodge are reserves whose focus lies in environmental education. (See Table 3 for a list of reserves investigated.)

Table 3. List of reserves investigated. Bosque Eterno visitor and hectare information are the same as the Monteverde Cloud Forest Reserve because Bosque Eterno land is under Monteverde Cloud Forest Reserve management.

<table>
<thead>
<tr>
<th>Reserve</th>
<th>Annual Visitors</th>
<th>Hectares</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monteverde Cloud Forest Reserve</td>
<td>80,279</td>
<td>10,500</td>
</tr>
<tr>
<td>The University of Georgia</td>
<td>150</td>
<td>50</td>
</tr>
<tr>
<td>Cloud Forest School</td>
<td>118</td>
<td>42</td>
</tr>
<tr>
<td>Bosque de los Niños</td>
<td>9,792</td>
<td>22,000</td>
</tr>
<tr>
<td>Santa Elena Cloud Forest Reserve</td>
<td>28,000</td>
<td>310</td>
</tr>
<tr>
<td>Ecological Farm</td>
<td>1,000</td>
<td>30</td>
</tr>
<tr>
<td>Biological Station</td>
<td>325</td>
<td>100</td>
</tr>
<tr>
<td>Sendero Tranquilo</td>
<td>1,000</td>
<td>92</td>
</tr>
<tr>
<td>Bosque Eterno</td>
<td>80,279</td>
<td>552</td>
</tr>
<tr>
<td>Selvatura</td>
<td>54,000</td>
<td>300</td>
</tr>
<tr>
<td>Sky Walk Sky Trek</td>
<td>40,000</td>
<td>20</td>
</tr>
</tbody>
</table>

Conducting Interviews

At each reserve, data were collected through personal interviews with reserve management (for a list of people interviewed, see Appendix A). The survey was quite extensive, with thirty-three questions. Questions covered topics such as the goals and visions of the reserve, management, resources of the reserve, adequate protection of the forest and its biodiversity, guide training, research, monitoring of biodiversity, community outreach, and the extent of environmental education offered by the reserve.

Forty-two ecotourists were interviewed from five reserves; the Monteverde Cloud Forest Reserve, the Santa Elena Cloud Forest Reserve, the Ecological Farm, and Selvatura. Ecotourists were chosen indiscriminately. They were asked if they considered themselves ecotourists, where they were staying, and if they knew or cared if it was a sustainable hotel. They were also asked how they got to Monteverde, what they looked for in a reserve, their overall satisfaction with their experience, and if they were made aware of any rules they had to follow while in the reserve.

A third set of interviews were conducted with nature guides. Ten guides from the University of Georgia, the Santa Elena Reserve were interviewed about their level of education, interest and awareness in biology and conservation, whether they were trained by their respective reserves, how they felt ecotourists were affecting the environment, and whether they believed there should be added regulations to protect biodiversity (see Appendix B for a complete list of all interview questions).
RESULTS

Environmental Education

Reserves were just as likely to offer environmental education as not. Environmental education was the main objective of three reserves, the University of Georgia, the Biological Station, and the Cloud Forest School. The University of Georgia and the Cloud Forest School do not seek profit, and for the Cloud Forest School, tourism had not even been successfully developed and played a very small role in their enterprise. The Biological Station receives very few ecotourists, and their main source of profit is student groups. However all three of these reserves use their private lands for the education of students, whether they be primary and secondary students (Cloud Forest Reserve) or college level students (Biological Station and the University of Georgia).

As for the seven reserves whose main objective is not environmental education, Bosque Eterno de los Niños, the Ecological Farm, Sendero Tranquilo, the Monteverde Cloud Forest Reserve, and the Bosque Eterno have no active environmental education programs. The Santa Elena reserve is run by a high school and they have environmental education programs for not only their high school, but also other schools in the area.

Table 4. Of questions answered by the reserves, four related to the extent of environmental education offered by the reserves, and are in the table below. The numbers in the yes and no columns represent the number of reserves responding either yes or no. The P-values were acquired by performing a Binomial Exact Test (JMP Program Package).

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
<th>% Yes</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental Education Programs?</td>
<td>5</td>
<td>6</td>
<td>45%</td>
<td>0.5</td>
</tr>
<tr>
<td>ICT approved guides?</td>
<td>11</td>
<td>0</td>
<td>100%</td>
<td>0</td>
</tr>
<tr>
<td>Researchers using reserve?</td>
<td>9</td>
<td>2</td>
<td>82%</td>
<td>0.03</td>
</tr>
<tr>
<td>Main objective environmental education?</td>
<td>3</td>
<td>8</td>
<td>27%</td>
<td>0.11</td>
</tr>
</tbody>
</table>

Research is also an important component of environmental education, and a significant number of reserves in the area have researchers working on their lands. Sky Walk Sky Trek, and surprisingly, the Santa Elena Reserve had no researchers. In the Monteverde area, there are 94 total researchers, however this number also includes students and not just full-time researchers.

Protection of Biodiversity

Nine questions addressed what measures reserves are taking to protect biodiversity and can be found in Table 4. Most reserves did not lack resources to protect their forests from poachers and hunting, and therefore most reserves also did not have these stresses on their land. The Bosque Eterno de los Niños, however, answered that protection of their land was a major problem. They only had five park guards to protect their 22,000 hectares of protected area. Although the Monteverde Cloud Forest Reserve also has a lot of land, very little of the perimeter of their reserve is exposed to rural areas where illegal hunting would be a problem. The Bosque Eterno de los Niños engulfs their reserve, and the entrance to the reserve is facing Monteverde, an area where the population is less likely to poach or deforest.

The reserves were asked to rank the objective of their enterprise from five categories: profit, tourism, conservation, education, and research. I’ve already covered that there are three reserves that have answered that education is their primary objective, with conservation as
marked as their second objective. Six of the remaining seven reserves had marked conservation as their number one objective. Selvatura was the only reserve to put tourism as their number one objective. This being said, however, most reserves did answer that although tourism was not their main objective, per say, tourism was important to fund their main objective of conservation.

Thirty-six percent of the reserves had deforested land in order to build structures to accommodate ecotourists (such as welcoming centers, etc). The other seven reserves had built their structures on land that had already been cleared at the foundation of the reserve. The only reserve that systematically monitored its biodiversity was the University of Georgia. No reserve was required to report monitoring of biodiversity to the government. Although there was no information exchange on biodiversity issues, reserves were required to follow the National Biodiversity Law and not extract any flora or fauna from protected areas. Half the reserves also cooperated with national parks. For example the Santa Elena Reserve allows national parks the use their facilities have meetings, and they often exchange ideas.

The reserves were asked if excess ecotourism had caused any problems for them. The Monteverde Cloud Forest Reserve is the only reserve that had told me they had problem with excess visitors, and thus limited the number of ecotourists on the trails, and allowed visitors on only 13% of their land. No other reserve had limits to the daily number of visitors allowed in the forest based on ecological reasons.

All reserves did, however, have good waste disposal. Most recycled through the Heliconia Hotel and composted. Every reserve was asked if they were registered with the government, and if they received any benefits from this relationship. Only the Bosque Eterno and the Bosque Eterno de los Niños received benefits of being registered with the national government through the payment for environmental services.

Table 5. The following nine questions address issues concerned with environmental protection. The numbers in the yes and no columns represent the number of reserves responding either yes or no. The P-values were acquired by performing a Binomial Exact Test (JMP Program Package).

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
<th>% Yes</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack Resource for protection?</td>
<td>2</td>
<td>9</td>
<td>18%</td>
<td>0.03</td>
</tr>
<tr>
<td>Cooperation with National Parks?</td>
<td>6</td>
<td>5</td>
<td>55%</td>
<td>0.5</td>
</tr>
<tr>
<td>Problem with Illegal Deforestation/Hunting?</td>
<td>3</td>
<td>8</td>
<td>27%</td>
<td>0.11</td>
</tr>
<tr>
<td>Land deforested for construction purposes?</td>
<td>4</td>
<td>7</td>
<td>36%</td>
<td>0.27</td>
</tr>
<tr>
<td>Annual Monitoring of Biodiversity?</td>
<td>1</td>
<td>10</td>
<td>9%</td>
<td>0.01</td>
</tr>
<tr>
<td>Eco-friendly waste disposal?</td>
<td>11</td>
<td>0</td>
<td>100%</td>
<td>0</td>
</tr>
<tr>
<td>Main objective conservation?</td>
<td>7</td>
<td>4</td>
<td>64%</td>
<td>0.27</td>
</tr>
<tr>
<td>Set of rules/regulations for ecotourists in reserve?</td>
<td>6</td>
<td>5</td>
<td>55%</td>
<td>0.5</td>
</tr>
<tr>
<td>Has excess tourism caused any problems?</td>
<td>1</td>
<td>10</td>
<td>9%</td>
<td>0.01</td>
</tr>
</tbody>
</table>

Community Outreach

Reserves were as likely to have community outreach as not, with seven reserves offering community outreach to varying degrees. Bosque Eterno, for example, donated $2,600 to programs related to water conservation last year. The biological station reaches out to the community through donations to help the Red Cross and the Monteverde Conservation League.
The Cloud Forest school has trash pickup and the community is free to attend workshops and presentations given by the school. The Monteverde Cloud Forest Reserve supports community-wide recycling. The University of Georgia teaches English and computer technology in schools and to adults. They also help with local infrastructure through the maintenance of roads and bridges in the San Luis area. They are currently building an aqueduct in San Luis to help residents get more access to water.

All reserves offered national citizens discounts into their reserves, and most local residents were allowed into their reserves at no cost. Selvatura and Sky Walk Sky Trek were the only reserves to offer no discount to local residents. All reserves, however, hired more local labor than labor from outside the Monteverde area.

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
<th>% Yes</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community outreach?</td>
<td>7</td>
<td>4</td>
<td>64%</td>
<td>0.27</td>
</tr>
<tr>
<td>National ecotourist discount?</td>
<td>11</td>
<td>0</td>
<td>100%</td>
<td>0.00</td>
</tr>
<tr>
<td>Local resident tourist discount?</td>
<td>9</td>
<td>2</td>
<td>82%</td>
<td>0.03</td>
</tr>
<tr>
<td>Free local school groups?</td>
<td>7</td>
<td>4</td>
<td>64%</td>
<td>0.27</td>
</tr>
<tr>
<td>Mostly local labor employed?</td>
<td>11</td>
<td>0</td>
<td>100%</td>
<td>0.00</td>
</tr>
</tbody>
</table>

**Reserve Ranking**

In order to compare reserves to one another, I assigned points to each yes/no question asked to the reserves. As tables four, five, and six show, specific questions asked the reserves could be categorized to a CBD guideline. Based on reserve responses, reserves were awarded a certain amount of points. For example, if the reserve had enough resources to protect its land, it received two points, and if it did not, it received no points. Figure 1 shows the rankings of the reserves from a total of the 51 points available. To see the points assigned to each reserve, how these points were allocated and reserve rankings, see Appendix C.
Figure 1. Ratings of reserves in the Monteverde area. Points were given to reserves based on their interview answers. Bosque Eterno (Monteverde’s first private reserve) proved to be most compliant with the criteria, with 35 points out of a possible 51 points. Selvatura and Sky Walk Sky Trek, the adventure companies, had the fewest points with 13 and 12 points respectively.

**Guides**

Many reserves did not hire their own guides, but relied on guides from an outside source. The Monteverde Association of Guides was a supply of many of these guides. The association was created in 1996 in an effort to professionalize the tour guide service in Monteverde, and more than 60% of their members have a licensed issued from Instituto Costarricense de Turismo (ICT), and two of their guides are part of the Monteverde Tourism Board of directors. (Instituto Costarricense de Turismo is a government program that seeks to promote a sustainable model of tourism.) The guides in the association work in the Monteverde Cloud Forest Reserve, the Santa Elena Reserve, the Ecological Farm, Sky Walk, Sendero Tranquilo, and the Bosque Eterno de los Niños.

All guides interviewed were educated in conservation issues, and aware of the rules and regulations in place (if they existed) that ecotourists were to follow while in the reserve. Half of the guides felt that ecotourists were negatively affecting the environment, while the other half thought that ecotourists were not affecting biodiversity at all. Trash was the number one problem guides associated with excess ecotourists. Most also felt that ecotourists were scaring animals away, and that visitors in the parks were too noisy. One guide mentioned he felt the condition of the forest (of the Monteverde Cloud Forest Reserve) was in better shape than it was twenty years ago. Half of the guides had not made it to secondary schooling, while of those who had, most had studied at least some years at university. Only one guide had no additional
education beyond primary schooling. Those who had not made it to university or to secondary school had either been trained as nature guides with the ICT, or at the Instituto Nacional de Aprendizaje.

Seven of the ten guides believed that there were not enough regulations in place at the reserves to help protect biodiversity from tourism. Some believed that groups of ecotourists allowed in the forest were too large. Two guides mentioned that although there were rules, that there was not enough enforcement and many tourists disregarded them. Another complaint was that tourists were too noisy, and that this scared the animals. The same guide mentioned he feared that tourists were introducing foreign pathogens into the forest. The head of the Monteverde Association of Guides, Oscar Fennell, told me that he believed there were too many rules, and many without any scientific justification. Examples of what he believed were unnecessarily strict rules were the prohibition of flash photography and laser pointers, which he believed should be allowed.

The University of Georgia had the most educated guides. Each guide was an intern from the United States, and had to have at least a bachelor’s degree. Once in Monteverde, they were given classes about Monteverde ecology. The Biological Station and the Cloud Forest School did not receive enough ecotourists to warrant hiring nature guides.

Table 4. Guide answers to interview questions. \(P\) values acquired through a binomial exact test (JMP program package).

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
<th>(P)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Higher than secondary school level?</td>
<td>5</td>
<td>5</td>
<td>0.62</td>
</tr>
<tr>
<td>University degree?</td>
<td>4</td>
<td>6</td>
<td>0.38</td>
</tr>
<tr>
<td>ICT trained?</td>
<td>8</td>
<td>2</td>
<td>0.05</td>
</tr>
<tr>
<td>Trained with reserve?</td>
<td>5</td>
<td>5</td>
<td>0.62</td>
</tr>
<tr>
<td>Trained on conservation issues?</td>
<td>10</td>
<td>0</td>
<td>0.00</td>
</tr>
<tr>
<td>Aware of rules of reserve for ecotourist behavior?</td>
<td>10</td>
<td>0</td>
<td>0.00</td>
</tr>
<tr>
<td>Do you feel that higher numbers of ecotourists affecting the environment?</td>
<td>5</td>
<td>5</td>
<td>0.62</td>
</tr>
<tr>
<td>Should there be additional regulations/policies not already in place?</td>
<td>7</td>
<td>3</td>
<td>0.17</td>
</tr>
</tbody>
</table>
Figure 2. Guides were asked if they felt higher numbers of ecotourists were negatively affecting the environment, based on their personal observations and experiences. When asked should there be additional regulations and policies in the reserve to protect biodiversity from ecotourists, 70% responded in the affirmative.

Tourists

When tourists were asked why they chose to visit Monteverde, all answers were related to nature, whether it was because of Monteverde’s unique ecology and cloud forest, or the fauna and flora, and a majority of tourists were satisfied with this aspect of the reserve. Seventy-four percent of tourists had driven to Monteverde in a car, and 98% had flown to Costa Rica from their country of origin. All tourists surveyed were from outside Central America. Tourists were more likely than not to receive some mention of rules or other use policies, though this was not statistically significant. Most tourists did not consider themselves ecotourists, but two-thirds said they felt it important that their hotel be sustainable. Almost 75% did not know whether their hotel used sustainable measures not.

Table 5. Six of the eight questions asked ecotourists, and their answers, yes or no. P values were acquired from a Chi square test.

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Figure 3. This figure compares ecotourist choice of hotel against whether they care that it be sustainable or not.

Figure 4. This figure shows how many ecotourists were made aware of rules/regulations they had to follow in the reserve. Of those that were made aware of regulations, the table shows by which medium.
DISCUSSION

There are only some definite conclusions I can draw from this study. Increased ecotourism does bring tangible benefits to the community through increased employment to locals, thus fulfilling guideline number four (from Table 1). They also all have good waste management, thus fulfilling guideline number two. And the last guideline all reserves were in compliance with was guideline number eight, as locals were given affordable access to the reserves. But, community outreach was limited, and more environmentally focused than socially. However, there is no long term monitoring or assessment of ecotourist impact on biodiversity, thus most reserves do not fulfill CBD guideline number five. This also means that one cannot measure the affects of ecotourism on the reserves, which makes it hard to know if any policies put in place to protect biodiversity are even effective.

A very positive aspect of private reserves in Monteverde is that they have enough resources to maintain and run their reserves, which is not the case of national parks (Honey 1999, Langholz 2001).

In terms of more subjective guidelines from the CBD, such as the encouragement of responsible ecotourist behavior or public education and awareness raising (guidelines number one, three, and six), it is not clear where Monteverde stands. The mere accessibility of the reserves to researchers is a good indication of environmental education. There are some environmental education institutions (Cloud Forest School, University of Georgia) which are a really good means of spreading environmental awareness to a variety of ages. But, those reserves that did not have environmental education as their main objective were not likely to promote environmental education. Educated guides are also conducive to environmental education, but to what extent? Part of ecotourism is encouraging ecotourists to be environmentally friendly and encouraging good behavior in the forests is a way to raise their awareness of the delicacy of the environment (Powell 1008). However, thirty-six percent of ecotourists interviewed were not made aware of any rules to follow. Perhaps this is not indicative of responsible ecotourist behavior, since many are probably already environmentally conscious. Based on ecotourist interviews, however, it seems that although ecotourists are well intentioned, they are not making the extra effort to stay at environmentally sustainable hotels.

What was clear was that some reserves were taking more measures than others to protect biodiversity. A good comparison would be the Cloud Forest Reserve with Selvatura. The Cloud Forest Reserve is the only reserve with policies in place to limit daily ecotourists and also has clear rules ecotourists have to follow. Selvatura did not have rules for ecotourists to follow and certainly did not place any limits on the large amount of ecotourists entering their reserve. It also did not offer any environmental or community programs. But, it is hard to assess how effective regulating ecotourism in this fashion really is. According to guide interviews, enforcement of rules already in place is lacking.

In conclusion, I felt it difficult to assess good management of ecotourism based on CBD guidelines, which are too vague. But, I do believe that guidelines are useful and necessary, because it is clear that not all reserves are taking measures to protect biodiversity. The CBD guidelines are a good start, with important broad generalizations, such as giving back to the community, protecting forest, and waste management. And, their message is clear: biodiversity must be protected. It is important that ecotourism be well managed, especially in Monteverde, which has so much biodiversity to offer, but which also receives hundreds of thousands of visitors a year. Monteverde reserves are doing well based on some guidelines, but this might not be enough. I propose that a new set of guidelines be introduced by more local organizations, in
order have guidelines specific to the Monteverde area and its ecosystems. These guidelines should be precise, with clear examples, and also provide robust scientific proof that these measures are worthwhile. Each reserve should have a clear plan on what measures it will take to protect biodiversity, including a set of well-indicated rules for ecotourists, and annual monitoring of biodiversity to assess yearly and decadal changes. By protecting the forest and its natural beauty, ecotourists can continue to benefit from the area as well as sustain the reserves financially.

ACKNOWLEDGMENTS

I would like to foremost thank Alan Masters for his guidance, patience, and support in this project. I would also like to thank Grace Heusner for being a wonderful colleague and a joy to work with. An extended thanks to the kind people from the Monteverde Biological Reserve, the University of Georgia, Bosque Eterno de los Niños, the Bosque Eterno, the Biological Station, the Ecological Farm, the Santa Elena Reserve, Selvatura, and Sky Walk Sky Trek, the Cloud Forest School, and Sendero Tranquilo for their time and cooperation with the investigative part of the project. A special thanks to Karen Masters, Marjorie Rodriguez, Scott Harlow, Oscar Fennell, and Mia Roberts for going out of their way to help me gather information. I would also like the thank Yi-men Araya, José Carlos Calderon Ulloa and Pablo Allen for all their patience and help, including translation and statistical work. And last but not least, I would like to thank Anjali Kumar for spending the time and effort helping get in touch with some of the harder to reach reserves.

LITERATURE CITED


APPENDIX A
List of Interviewees:

Marjorie Cruz, The Monteverde Cloud Forest Reserve
Fabricio Camacho, The University of Georgia Ecolodge
Alan Masters, The Cloud Forest School
Mia Roberts, Monteverde Conservation League, representing the Bosque Eterno de los Niños
Andrea Huertas, Finca Ecológica
Marvin Hidalgo, Biological Station
Zaïda Villalobos, Sendero Tranquilo
Karen Masters, Bosque Eterno S.A.A.
Heidy Garcia, Sky Walk Sky Trek
Samuel Marenco, Selvatura
Johnny, Santa Elena Reserve

Guides:
Oscar Fennell
Esteban Méndez Vargas
Rodrigo Solano
Eduardo Villalobos
Adrián Méndez
Scott Harlow
Ronaldo Martínez
Francisco Castro
Ricardo Guindon
Jorge “Coky” Porras
APPENDIX B

Questions for Ecotourists:
1) Do you consider yourself an ecotourist?

2) Why did you decide to visit Monteverde?

3) Where are you staying?
   a. Do you know if this is a sustainable hostel/hotel?
   b. It is important to you that your hotel/hostel follow sustainable measures?

4) How did you get to Monteverde (bus, car, etc…)

5) What other reserves have you visited/plan on visiting?

6) What do you look for in a reserve?

7) Have you been satisfied with your visit to this preserve? (services, etc)

8) Have you been made aware of any rules/regulations you are to follow while in the reserve?
   a. If so, how? (by poster, pamphlet, guide)

Questions for guides:
1) What is your level of education?

2) What has gotten you interested in working as a guide for ______?

3) Were you trained with ______ reserve?

4) What was the training process like? (length, subjects covered)

5) Were you educated on conservation issues?

6) Are you aware of certain regulations/guidelines being followed by __________?

7) In your personal opinion, do you feel that higher numbers of ecotourists are affecting the environment?
   a. If so, how?

8) Do you think there should be regulations/policies in place that don’t exist to help protect biodiversity?
   a. If so, which?
Questions for Reserves:
1) What is the objective on this enterprise in order of importance:
   a. Profit
   b. Tourism
   c. Conservation
   d. Education
   e. Research

Available Resources:
2) Lack of employees to ensure protection of the area (from poachers, deforesters, etc…)?
3) Enough resources (monetary and otherwise) to accomplish the goals of the reserve?
   a. Stock bathrooms, amenities, ect…
   b. Maintenance of reserve

Participation and involvement of community
4) Programs for outreach to the outside community?
   a. If so, give specific examples

5) How many local community members do you employ?

6) How many international (if any) personnel do you employ?

7) How are guides educated/trained?
   a. What is included in their training?
   b. Are they aware of conservation and biodiversity issues?

8) Does your reserve offer educative programs to the community?

9) What are your entrance fees?
   a. For international clients?
   b. For Costa Rican nationals?
   c. For local residents of the area?

10) Do these fees apply to all activities (night walks, to have guides, etc…)

11) Are special prices offered to school groups?

12) How many researchers work in your park?
   a. How many are from Costa Rican universities?
   b. International?
   c. Any cooperation, joint work done with national parks?

Adherence to government regulations:
13) Are you registered with the government as a private reserve?
   a. If yes:
      i. Do you receive benefits from this relationship?
      ii. Do you have to follow any regulations?
   b. If no, why have you chosen not to register?

14) Why are you/aren’t you registered with the Red Costarricense de Reservas?

15) Do you have to report to them, and in what capacity?

16) Do you have to report to the national government in regards to the monitoring of biodiversity in your reserve?

17) Are you certified with the Certificate for Sustainable Development? (ICT)

18) Has any land been taken from the reserve to build hotels, etc…?

19) Any problems with farmers/residents living on the reserves?
   a. Illegally cutting down trees, etc?
   b. Is there any enforcement?

Management Plans:
20) Who is making the decisions? (Board of execs, etc..)

21) Are there goals/criteria that these decisions are being based on?

22) Any monitoring/assessing of biodiversity?

23) Is this information shared with other organizations, the national government, the public?

Dealing with increased number of tourists:
24) How many visitors come to the park on a daily/yearly basis?

   a. Costa Rican?
   b. International?

25) What kind of regulations do you have set to protect biodiversity? (These can include rules such as no hunting, no removal of plants, no domestic animals allowed, no fires, no swimming, no removal of soil, zoning of certain sensitive areas of the park…)

26) Has excess tourism caused any problems for you?

27) What challenges has it brought?
28) What policies do you have in place to deal with these challenges? (Can I have a copy of official policies dealing with ecotourism?)

29) What are these policies based on?

30) Does the park have limits to the number of daily visitors permitted?
   a. If so, how are these numbers determined?

31) Is the park closed on particular days?

32) Where does your water come from?

33) Where does the waste from your facilities go?
## APPENDIX C

**Ranking criteria.**

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