

The Economic Importance of Extending Habitat Protection Beyond Park Boundaries: A Case Study from Costa Rica

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Where the northeast trade winds meet the continental divide in Costa Rica's Cordillera de Tilaran there grows a luxuriant forest, often cloaked in clouds and blowing mist. Here, moss covered trunks strain against the weight of epiphytes in profusion, as bromeliads, ferns and orchids festoon from a vine tangled canopy. This is the Monteverde Cloud Forest Preserve (Ross 1992).

SO BEGINS THE CORNELL LAB OF ORNITHOLOGY'S TESTAMENT to the biodiversity of Monteverde, *Voices of the Cloud Forest*, thirty-three minutes of bird calls, frog tinkles, monkey howls, and rain—lots of rain. Monteverde is deservedly well known and admired as a model for conservation. Its extensive network of public and private protected areas cover more than 70,000 acres, or 28,000 ha (Harvey et al. 2000), supporting more than 650 species of butterflies (Stevenson and Haber 2000), over 100 species of mammals, and approximately 426 species of birds (Young and McDonald 2000). The diversity of flora is equally impressive, with over 3,000 plant species, including 500 species of orchids and 870 species of epiphytes (Haber 2000).

Costa Rica is well known as one of the world's most important centers of biological diversity; and Monteverde is one of the most diverse and important environments in the country. A key to this diversity is that the Monteverde zone encompasses seven different life zones (Holdridge 1967) found on both the Atlantic and Pacific slopes of the continental divide. Species turnover is high (Harvey et al. 2000) because each life zone has a fairly distinct composition of flora and fauna.

It is common knowledge that simply delineating and protecting a conservation area, be it a national park, wildlife refuge, or

sanctuary, is normally not enough to ensure the survival of the numerous species of flora and fauna that utilize the habitat. Such is the case in Monteverde, an area renowned for its contributions to the study of tropical ecology. Even in Monteverde, conservation efforts have not succeeded in providing enough critical protection for many organisms.

While the Atlantic slope habitats are well protected, with over 26,000 ha (or >90% of the total conserved area in Monteverde), the Pacific side has little protection (Powell and Bjork 1995). Many biologists in the region realize that the conservation

work in Monteverde is not complete and many Pacific slope species are in jeopardy.

Of particular concern are two threatened bird species, the resplendent quetzal (*Pharomacrus mocinno*) and three-wattled bellbird (*Procnias tricarunculata*), both of which play an important role in the ecotourism economy of the Monteverde region. These species, among others, migrate up and down the mountain slopes following seasonal food sources in the various life zones (Powell and Bjork 1995). This makes the fundamental conservation of these species challenging. There has been a noted decline in population sizes of these birds due to the lack of protected Pacific slope habitat where they migrate during their post-reproductive season (Powell and Bjork 1985; Hamilton et al. 2000).

It is no exaggeration to say that people come from all over the world for the opportunity to see these particular species in the wild. If these birds did not exist, or were lost due to a lack of Pacific slope habitat, the economic consequences for the Monteverde area would be significant. Many studies document the ecological importance of buffering protected areas with additional habitat to ensure the well-being of organisms. In this study, we present an economic argument for the extension of habitat protection beyond the protected area boundaries in Monteverde.

Monteverde's economy is indeed based on ecotourism, but this is a relatively recent development (Baez 1996). In 1951, a group of American Quakers looking for a peaceful place to farm moved to a mountaintop in north-central Costa Rica. Shortly thereafter they set aside approximately one-third of the original tract as the Bosqueterno (Eternal Forest) to protect the water sup-

ply for their new cheese factory and dairying operation. These Quakers also brought along with them Monteverde's first chain-saw. It was in this community that George Powell, a biologist, and Wolf Guindon, one of the original Quaker settlers in Monteverde, spearheaded efforts that led to the creation of the Monteverde Cloud Forest Preserve.

Over the next few decades, visitation to the area transformed the primary focus of the economy from dairy farming to tourism (Echeverria et al. 1994). Local residents soon realized that it was much easier to work in ecotourism than to milk cows. As the numbers of visitors grew, so too did the number and diversity of "natural" attractions. Visitation to the Monteverde Cloud Forest Preserve alone has grown to 77,000 annual visitors (Friends of Monteverde Cloud Forest 2005). The resulting demand for hotels, restaurants, natural history guides, and other services has resulted in a standard of living for Monteverde's residents that is much higher than most other regions of Costa Rica.

In recent years, the prosperity of the Monteverde community has become increasingly threatened by a number of environmental problems, including water pollution, solid waste disposal, deforestation, and climate change. Of particular concern is the accelerated loss of Pacific slope habitat with the encroaching development and growth in worker housing for the ecotourism businesses. The Pacific slope habitat is essential to the survival of altitudinal migrants, especially quetzals and bellbirds, two of the major attractions for ecotourists visiting the region.

The altitudinal migration of both species involves seasons on both the

Atlantic and Pacific slopes of the continental divide, up to six months of the year on each side for the three-wattled bellbird (Powell and Bjork 1985; Hamilton et al. 2003). In the dry season, these birds follow Lauraceous fruiting trees upslope to the Monteverde area where more than 26,000 hectares of forest are protected within the privately run Monteverde Reserve Complex (Powell and Bjork 1995). It's here that these species nest and fledge their young.

It is along the Pacific slope and Guanacaste lowlands that these birds encounter an increasingly degraded and disturbed habitat. Guanacaste Province begins just below the boundary of the Monteverde Cloud Forest Preserve. Much of the province lies in the rain shadow of the Tilaran Mountains and is the principal locale for both the coffee and cattle industries in the region. These industries were well established long before conservation joined the list of national priorities in Costa Rica. Further downslope, the rain shadow forest gives way to tropical dry forest. Here, major government-sponsored agricultural development has created a landscape of cattle pasture, sugarcane, rice, and cotton (Edelman 1992). Today, the once-exuberant forests of Guanacaste, from the Pacific coastline to the cloud forest, are almost completely eliminated. As a result, the migrating quetzals and bellbirds are forced to crowd into a small number of remnant forest fragments (Hamilton et al. 2003). While this extreme localization is a boon to birdwatchers, it places the birds in an increasingly precarious situation. In this context, even the loss of a single large tree is significant.

Over the past decade, a number of conservation organizations have engaged in a campaign to restore these Pacific slope habitats through public and private efforts.

These efforts include improved forest management, habitat acquisition, reforestation projects, and increased environmental service payments.

One of the major conservation challenges in Costa Rica (and elsewhere) is convincing policy-makers, as well as citizens, of the economic importance of biodiversity protection. The effort to place an economic value on individual species is myopic in many ways. Aldo Leopold (1949) may have said it best when stating that "by making conservation easy, we have made it trivial." That is, the economic arguments for conservation are trivial when compared to our moral obligations to the rest of creation. And yet—in the development context of Costa Rica—the legitimate desire for a better standard of living demands that conservation provide short-run economic benefits. Resolving this dilemma, in many ways, is what sustainable development is all about.

Our paper examines the direct economic benefit of habitat conservation to the Monteverde community by measuring the local economic importance of two bird species: the resplendent quetzal and three-wattled bellbird. To better understand the contribution of these two species to the Monteverde economy, we conducted a personal-intercept survey (in either Spanish or English) of 515 visitors to the Monteverde region under the auspices of the Monteverde Camera de Turismo (the local tourism Chamber of Commerce). The survey was conducted at three "conservation-neutral" locations between October 2004 and June 2005.

Surveys were conducted at various times of the year to account for the seasonal nature of tourism in Monteverde. Budowski (1992) has identified two separate tourist

markets in Costa Rica. The dry-season market (November–May) attracts older, more affluent visitors. These tourists tend to stay for short periods of time, spending significant amounts of money each day. The wet- or “green-”season (June–October) visitors tend to be younger and less affluent, staying for a longer period of time but spending less money each day. Data for each market were collected and analyzed both separately and collectively.

Respondents were asked a series of questions to establish their reasons for visiting Monteverde, length of stay, daily economic expenditures in the area, and interest in the threatened birds. These data were combined with the estimate of yearly visitation to the Monteverde area provided by the Monteverde Camera de Turismo to arrive at the total economic value of tourism in the Monteverde area. Finally, this figure was multiplied by the percentage of visitors stating in the survey that they would not visit Monteverde if the bellbird and quetzal became extinct.

It is important to point out that our project measures only the direct tourism benefits associated with the two birds and does not attempt to measure the indirect and non-market ecosystem services that the species and their habitats may provide. It does not capture other non-consumptive values, such as option values and existence values, that accrue to Monteverde area residents and others as well.

Responses to the survey indicate that the average length of stay for visitors to Monteverde is 2.54 days and the average total visit expenditure per person is \$464. The Monteverde Camera de Turismo estimates the total number of yearly visitors to the Monteverde area at 135,000 (Molina, personal communication). Therefore, the

total annual economic value of tourism to the Monteverde area is estimated at \$62,640,000.

To determine the economic importance of the resplendent quetzal and three-wattled bellbird, we asked visitors whether they would still visit Monteverde if the bellbird and quetzal became extinct. At least 28% of our survey respondents indicated that they would not visit Monteverde in the absence of the birds. This cohort of dedicated birders is the key link between the protection of Pacific slope habitats and the Monteverde economy. Applying this figure of 28% to the total annual value of tourism in the Monteverde area (\$62,640,000) yields a figure of \$17,539,200. This number represents the direct annual economic contribution of the quetzal and bellbird to the Monteverde economy.

Demonstrating the value of these birds and their Pacific slope habitat should play an important role in furthering conservation efforts in the region. The intended audience for this study includes environmental activists, policy-makers, and local citizens (especially farmers, with land still in forest cover). A number of groups, most notably the Fundación Conservacionista Costarricense (the Costa Rican Conservation Foundation) are actively working to establish a biological corridor on the Pacific slope to connect the Monteverde Reserve Complex to other protected areas downslope. Clarifying the links between habitat conservation and economic development provides a strong foundation for these efforts.

Conclusions

There are clear links between the economy and the integrity of the natural environment; however, for many people, these

links remain an abstraction. This paper seeks to make these links tangible to people; in particular, the to decision-makers of Monteverde. The conclusions of this study are as follows:

- Despite the growth of other “attractions” in the Monteverde area, the resplendent quetzal and three-wattled bellbird still play an important role in attracting visitors to Monteverde.
- Efforts to expand the Monteverde Reserve Complex are clearly justifiable, both in ecological and economic terms. This expansion should be focused on protecting habitat on the

Pacific slope.

- In all likelihood, there is a “tipping point” at which the population of a given species becomes so small, and the possibility of seeing an individual of that species so remote, that the species (despite its nominal presence) is no longer a significant factor in visitor decision-making.
- Given the visibility and prominence of conservation efforts in Monteverde, a major decline in the presence of quetzals and bellbirds could undermine efforts to find a balance between conservation and economic development in other tropical environments.

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