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Impacts of birdwatching on human and avian communities

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SUMMARY

Ecotourism can be a vehicle for community-based conservation if it is conducted with an emphasis on the well-being of local ecosystems and human communities. Birdwatchers form the largest group of ecotourists, and are, on average, well-educated, wealthy and committed. This makes them ideal ecotourists for community-based conservation. Therefore, there is a need for a comprehensive review of birdwatching from a conservation biology perspective. Specific objectives here are: (1) to review the economic potential of non-residential birdwatching for community-based conservation; (2) to outline the potential benefits and problems associated with this activity; and (3) to provide suggestions for improving the conservation value of birdwatching. Birdwatching tourism has a high potential to improve the financial and environmental well-being of local communities, educate locals about the value of biodiversity and create local and national incentives for successful protection and preservation of natural areas. However, there needs to be more research on the economical and environmental impacts of this hobby, birdwatching-related disturbance needs to be reduced, and much has to be done to increase the financial contribution of birdwatching to local communities.

Keywords: bird disturbance, birdwatching, community-based conservation, ecotourism, profit leakage, protected areas, sustainable use

INTRODUCTION

The International Ecotourism Society's definition of ecotourism is 'Responsible travel to natural areas that conserves the environment and improves the well-being of local people' (Honey 1999). Ideally, ecotourism creates a local incentive for conserving natural areas by generating income through operations that are sustainable, low-impact (environmental and social), low-investment, and locally-owned (Boo 1990; Goodwin 1996; King & Stewart 1996; Isaacs 2000). Unfortunately, this ideal is rarely reached, in part due to what may be an inherent paradox: ecotourism aims to combine market-driven consumption of goods and services with sustainability (Isaacs 2000). In some cases, ecotourism actually creates new financial incentives for encroachment of natural areas through land speculation (Yu *et al*. 1997). Add to that the exclusion of local people from most of the benefits, leakage of profits out of the area, disturbance of wildlife, pollution, and even the outright habitat destruction that many 'ecotourism' operations cause (Honey 1999; Page & Dowling 2002), and it is easy to see why some consider ecotourism just another environmentally-destructive marketing device (Boo 1990; Giannecchini 1993). Adoption of only a few superficial aspects of ecotourism without making substantial changes to business practices that are not environmentally sound has been called 'ecotourism lite' (Honey 1999), and is likely to do more damage than good. In fact, activities ranging from powerboat trips through narrow gorges to chasing elephants with paint-guns have been called 'ecotourism' (Watkins 2000). Nevertheless, true ecotourism is preferable to alternative forms of economic development, such as logging, mining, or agriculture, because properly conducted ecotourism has the potential to protect natural areas and benefit local people at the same time (Weaver 1998).

Birdwatching is the act of observing and identifying birds in their native habitats. Birdwatchers are one of the best sources of ecotourism income since they form the largest single group of ecotourists, are educated, and have above-average incomes (Ceballos-Lascuráin 1996; Cordell & Herbert 2002). Because of the zeal of many birdwatchers and the resources these people are willing to invest in this activity, birdwatching is becoming the most rapidly growing and most environmentally conscious segment of ecotourism and provides economic hope for many threatened natural areas around the world (Cordell & Herbert 2002). For the purposes of this paper, I will not consider residential birdwatchers since they do not engage in any birdwatching-related travel.

The rapid growth of birdwatching and its high potential for providing a financial motivation for local people to protect natural areas merits a comprehensive review of birdwatching from a conservation biology perspective. The specific objectives of this review are: (1) to outline the economic potential of birdwatching for community-based conservation; (2) to examine the potential benefits and problems associated with this hobby; and (3) to provide suggestions for improving the conservation value of birdwatching.

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ECONOMIC POTENTIAL OF BIRDWATCHING

According to the estimates of the most recent USA national survey on recreation and the environment (NSRE) about 69.0 million people over age 16, or about a third of the human population of the USA over 16, viewed, identified or photographed birds in the 12 months preceding the survey; this was as many people as did any fishing or day hiking in the preceding 12 months (Cordell & Herbert 2002). Even though NSRE standards for what constitutes birdwatching are very broad, 28% of birdwatchers, or an estimated 19.3 million people, reported birdwatching more than 50 days per year. Since 1983, the number of birdwatchers in the USA has increased by 332%, making birdwatching the fastest-growing outdoor recreational activity in the country (Cordell & Herbert 2002).

In general, birdwatchers are educated and affluent. The average income of a birdwatcher in the USA is over US$ 50 000, and about a third have at least a college degree (Cordell & Herbert 2002). This makes them ideal ecotourists, since they are likely to have a high awareness of nature and also spend significant amounts of money in pursuit of birds. Birdwatching-related expenses were estimated to be over US$ 23 billion in 1996, contributing to the employment of almost 800 000 people (US Department of the Interior, Fish and Wildlife Service and US Department of Commerce, Bureau of the Census 1996). In that year alone, an estimated 17.7 million birdwatchers travelled more than a mile from their homes in order to observe birds and spent about US$ 7.6 billion on trip-related expenses, excluding equipment. The annual economic impact of five major birding sites in the USA was estimated to be US$ 2.4 million to US$ 40 million (Kerlinger & Brett 1995). Munn (1992) estimated that each macaw visiting a clay lick in south-eastern Peru can potentially generate US$ 750–4700 in tourist receipts in a year and US$ 22 500–165 000 over its lifetime.

According to Kellert (1985), 300 000 American birdwatchers can be considered committed. These committed birdwatchers form the core group of international birding trip participants. Based on the 1994 American Birding Association membership survey (American Birding Association 1994), 49% of committed birdwatchers travel out of the country for birdwatching. Of those, 32% have taken part in an organized bird tour. There are at least 127 companies that offer birdwatching tours worldwide (see, for example, Birding.com 2001), and considering that the average trip to a less developed country (*sensu* Weaver 1998) from one of the largest six birding companies (over 150 birding tours per year) has 12 participants and costs over US$ 4000 per person, the financial impact of international birdwatching can be substantial.

Birdwatchers often visit places outside the tourist season or places that have no other tourist attractions (Kerlinger & Brett 1995). In addition to contributing to a country's economy through the purchase of typical travel goods and services, independent birdwatchers and birdwatching tours may also hire local nature guides, sometimes paying as much as US$ 150 per day, even in low-income countries like Kenya and South Africa. In 1999, the Costa Rican Tourism Institute (ICT) estimated that 41% of the US$ 1 billion tourism income for that year was from tourists who came to Costa Rica for birdwatching (R. Arias de Para, personal communication 2001).

ECONOMIC AND ECOLOGICAL IMPACTS OF BIRDWATCHERS

Birdwatchers, like most ecotourists, are highly educated, both in terms of conventional education, as well as in terms of ecological knowledge and their higher awareness of conservation issues (Cordell & Herbert 2002). For example, about two-thirds of the 600 000 members of the National Audubon Society, a prominent conservation organization, are self-proclaimed birdwatchers (Dickinson & Edmonson 1996). Compared to the average ecotourist, birdwatchers are also more independent, focused and committed (Page & Dowling 2002). The high expectations of many birdwatchers, combined with their high average incomes, can result in large financial contributions to the localities visited (Kerlinger & Brett 1995).

Given their education and high expectations, birdwatchers are more likely to make efforts to reduce their environmental impact, to appreciate the distinctness and significance of different ecosystems and to pay the required protected-area fees while travelling, than other ecotourists, although there has been very little research on these issues (Hill *et al*. 1997). Birdwatching also has a lower environmental impact than many other outdoor activities that are mislabelled as ecotourism, such as multiple vehicles chasing cheetahs in Masai Mara, jet boats roaring through New Zealand canyons or off-road vehicle trips destroying the top soil in various parts of the world (Weaver 1998; Page & Dowling 2002).

Below, I present a detailed analysis of the pros and cons of having birdwatchers in ecologically-sensitive areas and provide some recommendations for minimum-impact birdwatching practices that would benefit local communities (Table 1). My focus is on birdwatching in less-developed countries, especially in the tropics, from where there are hardly any data on the ecological, economical and social aspects of birdwatching (Groom *et al*. 1991; Munn 1992). Consequently, I will use a few examples from my birdwatching experience in over 30 less-developed countries to supplement the published data.

Benefits of birdwatching

Why commodification may be a good thing

Birdwatchers' knowledge of birds and expectations of seeing a variety of species provide a direct link between avian biodiversity of a region and local income. Although birdwatchers

Table 1 Impacts of birdwatching and some recommendations to minimize disturbance and maximize local involvement.

Positive impacts of birdwatching	*Negative impacts of birdwatching*	*Recommendations for optimal birdwatching*
A link between avian diversity and local income	Disturbing birds by playing tapes and by approaching	Adhere to and insist on ethical birding conduct
A financial incentive to conserve wildlife	Increased nest predation and nest abandonment	Avoid nests and young as much as possible
Less impact and more income than typical tourism	Increased disturbance of rare and/or threatened birds	Show particular care with threatened and rare species
Increased local control due to unique bird species	Visitor-related pollution and habitat destruction	Minimize tape use and try to minimize being seen
Visitation of areas outside traditional tourist itineraries	Cash leaks from local communities	Do not approach further once a bird notices you
Protection of unprotected areas with desired species	Resentment by excluded locals	Stick to established roads/trails/walkways
Valuation of local natural history knowledge	Cultural degradation associated with tourism	Use scopes for observation and photography
Education and employment of local guides		Educate locals about birds and their financial benefits
Generation of funds for bird conservation		Support local and low-impact establishments
Contribution to ornithological knowledge		Contribute to NGOs active in bird conservation

are sometimes criticized for commodifying nature through 'twitching' or 'listing' (the intensive practice of making lists of bird species seen), this commodification actually makes it possible for local communities in areas with many and/or rare bird species to generate more income from hosting birdwatchers than other tourists. However, many rare bird species are highly sensitive to disturbance and are threatened (BirdLife International 2000), so birdwatchers and guides should be particularly careful to minimize the disturbance of rare species.

Because most birdwatchers know what they want to see and have high expectations of seeing certain species, they are likely to spend more money in order to see bird species in their natural environment than the average ecotourist who is not particularly interested in birds. The consequent increase in the local awareness of the value of bird biodiversity may be one key to preserving many natural areas near human population centres. Local people who derive direct monetary benefits from biodiversity as a result of showing various species to birdwatchers are more likely to conserve ecosystems that harbour unusual birds. That would not be as likely if locals mostly hosted ecotourists for whom a muddy forest trail, a waterfall and a few unusual organisms may constitute an exotic adventure.

Increased value of local differences due to unique bird species

One of the biggest concerns with regard to the effectiveness of market-based initiatives in limiting negative impact on ecosystems is global competition between ecotourism sites. For many people, the differences between natural areas around the world may not be significant, resulting in these places becoming competitors in a single market (Isaacs 2000). This is especially the case for rainforests, which, although highly differentiated and diverse, may seem identical to tourists with limited knowledge.

Competition and fear of profit loss may make it less likely that operators will follow more costly environmental principles as a marketing strategy, especially if clients do not discern habitat-quality differences between sites (Yu *et al.* 1997). Operators may try to minimize expenses and may stop taking costly measures to limit pollution, habitat disturbance, harassment of wildlife and other detrimental consequences of tourism. They may seek vertical integration and may contract with an international chain to take advantage of economies of scale to reduce costs and uncertainty (Isaacs 2000). This often results in less local control and lower economical returns to local communities, violating one of the most important principles of responsible ecotourism.

Since the premise of birdwatching, especially that of listing, is based on the identification of distinct bird species, the differences between distinct bird communities become highly significant. This reduces global competition between natural areas and results in a more even distribution of birdwatching tourism across the globe, as can be seen from the itineraries of birdwatching tour companies (see Birding.com 2001). Differentiation of birdwatching destinations increases the amount of local control, as well as the profits for any given area, resulting in increased incentives for local people to protect the environment (Isaacs 2000). In addition, the importance of specific destinations provides a greater incentive for birdwatching tour operators to make sure their destinations are well-protected.

Inclusion of areas without official protection

Better ecological knowledge and higher expectations of birdwatchers also result in the preservation of many areas without

official protection. Birds do not pay attention to park boundaries and many species can only be observed outside officially protected areas. It is not uncommon to find rare bird species surviving in small forest remnants, and the constant presence of birdwatchers and associated income may create local incentives to protect these small patches from further destruction. There is also a growing number of private nature reserves, such as Rara Avis and Monteverde in Costa Rica (Dworetzky 1992; Aylward *et al.* 1996), where good bird habitat is protected in order to obtain income from visiting birdwatchers, as well as from other ecotourists.

Birdwatching guides

A knowledgeable guide is key to the success of any organized birdwatching trip, and for independent birdwatchers with high expectations, hiring a local guide is highly beneficial because it increases the chances of seeing the less common and local species, contributes to the local economy and creates an incentive to protect birds. For example, in Sivrikaya, Turkey, Mustafa Sari maintains a chain across a dirt road to prevent illegal hunters from driving to the remote leks of Caucasian grouse (*Tetrao mlokosiewiczi*), a potentially threatened species (BirdLife International 2000) and his main source of income.

In many places, indigenous people lack the education and essential financial resources required to invest in ecotourism and they usually qualify for the most menial and low-paid jobs (King & Stewart 1996). Guiding for bird watchers, however, is less demanding, better paid, values knowledge of natural history and has minimal language requirements. The names of local bird species comprise the only English many successful guides speak. Although knowledge of natural history was crucial to many indigenous communities around the world, the dependence on market economies has resulted in the disappearance of this knowledge from many areas. The incentive to earn income as a birdwatching guide may restore this knowledge into native communities. Many birdwatchers do prefer guides who speak the birdwatchers' language and, as a result, expatriate guides (who may also be more knowledgeable) may be preferred to local guides. However, using local guides whenever possible often delivers the greatest number of bird species for the money, as well as contributing to the local community.

Birdwatching companies, non-governmental organizations (NGOs) and ornithologists working in less-developed countries can promote ecotourism and conservation with guide-training programmes. For example, a project to train rural residents as nature guides in Costa Rica has been very successful (Paaby *et al.* 1991). Out of 22 graduates interviewed after 5 months, six had become full-time nature guides and 16 had become part-time nature guides, hired by national parks, research stations and private tour operators. Such training programmes can supply field assistants and birdwatching guides, and can provide local employment while increasing environmental awareness.

Problems with birdwatching

Disturbing birds

The high expectations of many birdwatchers are not always beneficial and the excessive zeal of some birdwatchers to see or photograph certain species may have harmful consequences. A review of 27 studies on the effects of wildlife observation and photography on birds reported negative effects on birds in 19 of the studies (Boyle & Samson 1985), even though most of these may be due to photography rather than birdwatching (Klein 1993; Tershy *et al.* 1997). Here, 'disturbance' mainly refers to intrusion and excludes habitat modification.

Unfortunately, there are few well-designed, long-term studies of bird disturbance by birdwatchers and other nature observers (Hill *et al.* 1997) and the data are from fewer than 100, mostly temperate species, obtained mainly during the breeding period (Cooke 1980; Boyle & Sampson 1985; Holmes *et al.* 1993; Klein 1993; Knight & Gutzwiller 1995; Fernández-Juricic *et al.* 2001). Well-designed, long-term studies are sorely needed, especially in the tropics where there has been almost no published bird disturbance research (Groom *et al.* 1991; Burger & Gochfeld 1993). Impacts of disturbance are complex, with responses differing between species, between individuals of the same species, and even between different periods for the same individuals (HaySmith & Hunt 1995; Knight & Temple 1995). Nevertheless, I provide some recommendations to minimize disturbance by birdwatchers, based on the patterns that emerge from the data available (Table 1).

The majority of the birds studied were most sensitive to disturbance during the breeding period (Götmark 1992; Knight & Cole 1995). Human presence around bird nests increased nest abandonment and egg loss due to nest predators (HaySmith & Hunt 1995; Hanson 2000), so birdwatching activity should be minimized around nests and young, especially around nesting colonies, which can be deserted as the consequence of the disturbance induced by just one person (Larson 1995). However, when visitors are concentrated in a small part of albatross and penguin albatross breeding colonies, nesting birds habituate to people and do not respond to human presence as a stressor (Burger & Gochfeld 1999; Fowler 1999). Many birdwatchers play calls of secretive species to lure them out of their hiding places and, during the breeding period, this may stress birds, as well as leave nests exposed to predators. There have been no studies on the effects of tapes on birds and this should be a research priority of bird disturbance researchers.

Even outside the breeding period, birdwatchers should minimize flushing of birds, since this has high physiological costs for many species (Gabrielsen & Smith 1995) and can be fatal to birds during times of food shortage (Knight & Cole 1995). Minimizing bird disturbance and flushing will also improve the quality of birdwatching and may increase bird abundance and species richness (Gutzwiller 1995; Fernández-Juricic 2000). Larger and more specialized

species, birds of prey, birds in groups, and birds far from vegetation cover tend to be flushed more easily (Holmes *et al.* 1993; Hill *et al*. 1997; Fernández-Juricic *et al*. 2001). Because of the variations between species and individuals (Knight & Temple 1995), the alert distance, which is the distance at which a bird becomes aware of the observer(s), should be used as the minimum approach distance (Fernández-Juricic *et al*. 2001).

Birds are less sensitive if they are visually shielded from observers (Knight & Temple 1995), so birdwatchers should make use of inconspicuous clothing (Gutzwiller & Marcum 1993), blinds, vegetation and other ways to minimize being seen by birds (Larson 1995). Birdwatching telescopes should be used whenever possible; even in tropical forests, these can be surprisingly effective and often provide superb views of perching birds (Munn 1992) in addition to limiting disturbance. In combination with inexpensive digital cameras, telescopes can also be used to obtain high-quality images from a safe distance (Ingraham 2001).

If birds have to be approached, a slow approach from an oblique angle is preferable (Knight & Cole 1995) and they are more tolerant of vehicle approaches than people (Holmes *et al*. 1993). Since birds are highly sensitive to noise and the number of people (Knight & Cole 1995), groups should be kept small, preferably under 10 people. Birds that come into contact with people more frequently are more habituated and approachable, provided that they are not hunted (Cooke 1980; Knight & Cole 1995). Birdwatching in areas with some human traffic, such as dirt roads, would minimize disturbance of pristine areas and allow closer views of birds.

Birdwatchers should be particularly careful with threatened and near-threatened species (BirdLife International 2000). These species are usually more sensitive to people because of their biology, increased exploitation and greater disturbance by birdwatchers seeking them out. Birdwatchers should not contribute to the extinction of threatened birds.

Guides also have an important role to play in minimizing disturbance of birds by birdwatchers. In fact, this makes good business sense, since the long-term presence of 'staked-out' birds will increase a guide's success rate and reputation. Unfortunately, some guides, especially those who are uncertified and uneducated, often contribute to the disturbance of wildlife (Groom *et al*. 1991). Rigorous training, certification, and regulation of guides, especially in less-developed countries, by governments and by birdwatching companies, are integral to educating tourists and minimizing disturbance (de Groot 1983; HaySmith & Hunt 1995).

Indirect impacts

Because birdwatchers have high average incomes, they may demand more luxurious accommodation than the average ecotourist. This could potentially lead to increased environmental impact (HaySmith & Hunt 1995; Page & Dowling 2002) and transfer of profits from local communities to foreigners and urban dwellers who are far more likely than rural residents to own luxury establishments in less-developed countries (Ceballos-Lascuráin 1996; Weaver 1998; Page & Dowling 2002). Local people who are excluded from protected areas and who do not benefit from tourists are likely to resent them and resist conservation policies. In addition, areas visited can be contaminated by tourist waste, and construction of buildings and facilities may result in habitat clearance (HaySmith & Hunt 1995; Weaver 1998).

However, for many birdwatchers, birds take priority over comfort. Many will stay in basic local establishments in order to see the species of interest (Page & Dowling 2002). Additionally, some luxury resorts attract birdwatchers by minimizing environmental impact, maintaining private reserves, and hiring local birdwatching guides. These establishments are likely to benefit the local communities more than lodges without a birdwatching focus. If birdwatchers wish to aid local communities as much as possible, they should make an effort to frequent locally-owned establishments with environmentally sound practices.

Overview of birdwatching impacts

Despite the potential for disturbance, birdwatching, especially if properly conducted, is far preferable to land clearing, hunting and other exploitative, unsustainable activities. In addition, 'citizen science' projects, where ornithological data are collected by dedicated amateur birdwatchers (for example, the Christmas bird counts that take place around Christmas and counts during breeding bird surveys), can contribute substantially to ornithological knowledge, especially in tropical areas with few researchers (Ehrlich *et al*. 1988; Mason 1990; Cornell Laboratory of Ornithology 2000). Birdwatchers should always aim to minimize their negative impact on birds by adhering to established ethical guidelines (American Birding Association 1997), while contributing as much as possible to local economies. They should do so in the face of high expectations of finding species of interest and be particularly careful with threatened or near-threatened species. Birdwatchers should insist on certified guides and should criticize any improper conduct of guides. Contributing to the local economy, educating local people, and minimizing wildlife disturbance will enable communities to preserve good bird habitat and will help ensure the continuous presence of birds to be watched.

Independent birdwatcher versus birdwatching tour

Independent birdwatchers are more likely to contribute to low-budget local establishments and in a more even manner since, unlike tour groups, they frequent smaller and more modest establishments (Page & Dowling 1992). Since they do not benefit from a tour guide, independent birdwatchers often hire local guides and are less likely to be isolated from the communities they are visiting. However, independent birdwatchers are usually not subject to monitoring by a bird

guide who is trained in low-impact practices. As a result, they may be more likely to disturb birds.

Birdwatching tours (especially those originating from more-developed countries), although significantly more expensive than independent birdwatching, may contribute less to local economies than independent birdwatchers. These tours have their own guides and often make use of the best operations and accommodations available, which are likely to be owned either by foreigners or the urban elite (Weaver 1998). Nevertheless, it is important not to draw hasty conclusions about economic leakage due to birdwatching companies, since data on the kinds of establishments birdwatching tours use in less-developed countries are sparse and there are exceptions to this pattern. In addition, when they make use of a local establishment, tour companies are likely to contribute significantly greater amounts per birdwatcher to the local economy. Many tour companies also hire local guides, and such companies are likely to pay significantly more than independent birdwatchers.

Not only should these companies perceive a moral obligation to contribute to the conservation efforts of the less-developed countries in which they operate, but it is also in their long-term interest to create financial incentives for conservation. Only one of the top six international birdwatching companies (Birding.com 2001) made any mention of conservation on its web page in 2001 and only this company seems to have made any direct contributions to conservation, as cited in the relevant literature (Boo 1990).

SUGGESTIONS FOR IMPROVING THE CONSERVATION VALUE OF BIRDWATCHING

Research, promotion and education

Overall, there is a pressing need for data on the financial contributions and environmental impacts of independent birdwatchers and tour companies focusing on birdwatching, especially in less-developed countries (Kerlinger & Brett 1995). Financial data on birdwatching would increase the likelihood of tourism ministries becoming aware of the potential benefits of organizing and promoting birdwatching in their countries. Even in well-known birdwatching destinations such as Ecuador, promoters of tourism know very little about birdwatching possibilities in their country. The fact that Costa Rica, a small Central American country that has distinguished itself by emphasizing conservation and ecotourism, was estimated to generate US$ 410 million from birdwatching in one year (R. Arias de Para, personal communication 2001) should be enough to convince any country of the financial significance of birdwatching.

With additional information on the monetary flows from different kinds of birdwatching tourism, the promotion of this industry can also be enhanced. For example, one good way to promote birdwatching and create revenues is through the organization of birdwatching festivals. There are over 240 bird-related festivals in the USA, bringing millions of US dollars to many small towns in 47 states (Kerlinger & Brett 1995; DiGregorio 2002). There are, however, very few examples of birdwatching festivals in less-developed countries (BirdLife International 2001*a*). The creation of such festivals could increase earnings, as well as educate local people about the importance of birds, conservation and the potential of birdwatching as an alternative source of income. Another possibility is to donate some of the income from birdwatching festivals in more developed countries to bird conservation programmes in less developed countries. One successful example is the British Birdwatching Fair that raises funds for tropical conservation and has raised over US$ 190 000 in 2000 to protect threatened Cuban wilderness (BirdLife International 2001*b*).

It is also essential to educate the governments, companies, and individuals interested in birdwatching on the potential negative environmental impacts of birdwatching, as well as on ways to minimize these. Not only this is an important conservation priority, it is also integral to the long-term success of birdwatching tourism.

Tour companies

Birdwatching companies should be more involved in promoting and supporting conservation at their tour destinations, possibly by making contributions directly related to the number of species seen on their trips. This will have significant financial and symbolic value for local communities and will provide publicity for the companies involved. For example, they might contribute US$ 1 to the local partner of BirdLife International or another conservation NGO for each species seen by each participant of a birdwatching tour, and promote this in their advertising to prospective clients. Substantially greater sums might be donated for each threatened species (for example, US$ 20) and for each near-threatened species (for example, US$ 10), which would mean more funds for countries with species at risk.

I analysed the prices of 272 birdwatching tours to 62 less-developed countries included in the online catalogues of the top six international birdwatching companies (Birding.com 2001). The tour prices did not include the prices of flights to the tour destinations, and botanical tours, ship-based tours and trekking tours were excluded from the analysis. Given the fact that the average tour of one of the top six companies has 12.12 clients, runs for 15.18 days, costs US$ 264.4 per day, and that the maximum number of species seen per day for trips over a week is 10–25 in most countries, US$ 1 per species per observer would amount to a modest price increase of 3.8–9.5% per trip participant. For example, after a three-week birdwatching tour in Kenya during which 517 species were observed by 12 people, the company would contribute US$ 6204 to a Kenyan NGO involved in bird conservation while charging the clients a total of about US$ 66 500. Independent birdwatchers should also try to contribute 5%

of their trip budget (excluding airfare to the country) to local bird conservation NGOs.

When properly conducted, tourism-revenue sharing, although marginal for the companies and birdwatchers involved, can add up to significant amounts for the less-developed countries visited, show a one-to-one link between biodiversity and income, increase local support of conservation (Archabald & Naughton-Treves 2001), and give competitive advantages to the tour companies who demonstrate their environmental concerns. International NGOs that undertake ecotourism research, such as BirdLife International, Conservation International, and the World Conservation Union (IUCN), can work with major birdwatching companies to increase the contributions of these companies to the local economies of the places that they visit. In exchange, these NGOs can certify the companies that make significant contributions to community-based conservation. Certification would provide beneficial publicity for the companies involved, profiting both sides.

CONCLUSIONS

Birdwatching is a most promising branch of ecotourism because birdwatchers comprise a large and increasing pool of educated and wealthy individuals who desire to observe birds in their native habitats and whose activities have relatively low environmental impact. Among various kinds of ecotourism, birdwatching has the highest potential to contribute to local communities, educate locals about the value of biodiversity, and create local and national incentives for successful protection and preservation of natural areas. The governments of less-developed nations, local and international NGOs, and birdwatching companies should give priority to birdwatching promotion and education. These organizations should also strive to increase the contribution of birdwatching to rural communities and local grass-root organizations since birdwatching has a significant potential to generate income through the protection and promotion of natural areas.

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