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Achieving Bat Conservation Through Tourism

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Bats are beneficial to ecosystems around the world, and are often keystone species. However, bat populations are declining worldwide and conservation efforts are needed to conserve bat species throughout the world. Worldwide, superstitions and fear of bats prevail and prolong negative attitudes and human hostility toward most bat species. In the case of other species (e.g. wolves and alligators), tourism efforts have led to improving attitudes and species viability. These examples suggest that bat tourism has a potential to conserve bat populations while providing social and economic benefits to local people in host communities. This article adopts an existing definition of non-consumptive wildlife-oriented recreation to frame the issues, summarises the ecological importance of bat species, provides an overview of the existing bat-human relationship, and adopts guidance from existing wildlife tourism initiatives. Information based on studies of wildlife tourists seeking other species is presented, as are examples of bat conservation initiatives based on tourism to change attitudes toward bats while stressing awareness of both potential negative impacts on bat species and economic benefits for local communities. Several existing examples of destinations which are attracting tourists to view bats, are discussed.

Keywords: tourism, bats, ecotourism, wildlife watching, conservation, recreation

Introduction

This paper examines the potential of wildlife watching tourism to contribute to bat conservation. Two basic characteristics of ecotourism described by Honey (1999a), promoting environmental awareness and providing environmental protection, are often the premises that drive wildlife conservation and wildlife tourism ventures. Even endangered species have benefited from wildlife tourism. Mountain gorillas in Uganda, for example, may owe their survival to tourism (Lepp, 2002; Salt, 2000).

Bats are an order of mammals (chiroptera) whose conservation is vitally important for the sustainability of many of the world's ecosystems. They pollinate many desert and rainforest plants. Insectivorous bats devour thousands of pounds of insects nightly, and frugivorous bats spread seeds, replanting

patches of rainforests. However, it is estimated that 45% of the world's bat species are endangered, threatened or near-threatened (Mickleburgh *et al.*, 2002).

A number of wildlife tourism operations have successfully conserved several species while providing economic benefits to host communities. These examples, along with the importance and need for bat conservation, highlight the potential of using tourism to aid chiropteran conservation. Owing to the lack of research on bat tourism, this paper discusses how tourism can be used in the conservation of bat populations. Overall, the paper will posit that many bat species are in need of conservation, and non-consumptive wildlife-oriented recreation can be used as a tool in conservation efforts. Specifically, this article has five objectives:

- (1) to provide an introduction to bat biology and ecology and how it relates to tourism;
- (2) to describe humans' historical role with bats and how this has led to a need for bat conservation;
- (3) to discuss the role of wildlife tourism and how it specifically relates to bat conservation;
- (4) to discuss the benefits local communities can derive from bat tourism initiatives; and
- (5) to discuss how bat tourism has contributed to the conservation of many species of chiroptera through successful examples of bat tourism.

To achieve these objectives, this paper adopts the definition of non-consumptive wildlife-oriented recreation (NCWOR) posited by Duffus and Deardon (1990: 215): 'a human recreation engagement with wildlife wherein the focal organism is not purposefully removed or permanently affected by the engagement.' Duffus and Deardon (1990: 217) also maintain that in terms of NCWOR there is a need for 'the social scientist to understand the interrelated concepts of satisfaction that produce the recreational benefits.' NCWOR has several key elements, central to the benefits potentially derived from bat-related tourism, that will be discussed further: the focal species, the recreationist, the history of the relationship between the two (Duffus & Deardon, 1990) and the recreational context (Wilson & Heberlein, 1996). Although most previous research has not considered the host community an element of direct concern of NCWOR, it does play an important role in the ecotourism literature (Fennell, 1999; Honey, 1999a; Stein, 2001) and will be discussed in this article. All of these elements interact in 'bat tourism' and 'bat watching recreation', terms which will be used interchangeably in this article. Each element will be discussed with examples to illustrate important managerial considerations for bat tourism.

Bats

There are 1105 different species of bats (order Chiroptera), nearly one-quarter of all the mammalian species on earth (Engstrom & Reid, 2003). Bats are found in nearly every habitat from desert to tropical rainforest, inside caves to northern forests. They are located on every continent except Antarctica. Most bats serve vital roles in the ecosystems they inhabit. In fact, many are keystone

species (Tuttle, 1988). In other words, if they were removed from an ecosystem, the overall health of the ecosystem would deteriorate, posing a threat to the survival of other species of animals and plants. For example, the night blooming baobab tree in Africa, often referred to as the 'tree of life' because numerous species of plants and animals depend on it for survival, has evolved to be pollinated solely by bats such as Wahlberg's epauletted fruit bat (*Epomophorus wahlbergi*; Nowak, 1994). In the desert southwest of the USA and northern Mexico, plants such as organ pipe cacti, saguaro cacti and agave sustain many of the creatures in the area and are pollinated primarily by bats. There the bats and agave serve as keystone species in a web of ecological interactions (Arita & Wilson, 1987). Evolved for bat pollination, the nectar of the night-blooming agave flowers contain two amino acids that are utilised by bats but are of no use to the agave itself (Arita & Wilson, 1987). These two amino acids, proline (for building muscle tissue) and tyrosine (used by lactating mothers as a growth stimulator for their young), are essential to the greater (*Leptonycteris nivalis*) and lesser (*Leptonycteris curasoae*) long-nosed bats and Mexican long-tongued bats (*Choeronycteris mexicana*; Heacox, 1989). The agave benefits from the bats' cross-pollination services in seed production, which drops to 1:3000 without bats (Howell, 1980).

Bats also provide ecological advantages more directly beneficial to humans. Bats are responsible for pollinating and dispersing the seeds of economically important plants such as bananas, mangoes, guavas, cashews, dates, figs, tequila, hardwood timbers and medicinal plants. In fact, bats pollinate the durian fruit, popular in Asia, which has an annual harvest estimated at approximately \$112 million (Morton & Murphy, 1995). In the USA, the majority of bats are insectivorous, consuming thousands of pounds of insects per night. The 20 million Mexican free-tailed bats (*Tadarida brasiliensis*) of Bracken Cave in Texas, can consume in excess of 250 tons (500,000 pounds) of insects each night (Tuttle, 1994). Night-flying insects consumed by bats are often agricultural pests, such as two moth species eaten by bats, corn earworms (*Heliothis zea*) and tobacco budworms (*Heliothis virescens*). These two moths cause US farmers to spend over a billion dollars annually in an attempt to prevent their larvae from feeding on crops (McCracken & Westbrook, 2002; Murphy, 1993).

The Bat-Human Relationship

Bats, despite their numerous ecological benefits, have been some of the most misunderstood and persecuted animals worldwide (Toops, 1995). People fear and loath them, believing bats to be blind rats with wings that carry rabies, cause blindness, suck human blood and fly into people's hair. Bats have had their roost sites dynamited, set on fire and sealed off. For example, people in Latin America continue to kill thousands of bats, believing all bats to be vampires that feed on human blood (Morton & Murphy, 1995). In Australia megachiropteran species of flying foxes, sometimes called black devils with wings, have been shot, poisoned with strychnine, electrocuted, burned with flamethrowers, and had their roosts disturbed by burning tires, noise and even helicopters (Grzelewski, 2000). In a study of American's attitudes toward animals, bats were one of the most disliked of all animals along with

rats, roaches and rattlesnakes (Kellert, 1980). These attitudes and associated behaviours no doubt contribute to a situation where more than 50% of American bat species are in severe decline or are already listed as threatened or endangered (Toops, 1995).

Bats are also endangered because of over-harvesting and habitat loss. In Micronesia, the Chamorro people of Guam and the Commonwealth of the Marianas view many species of flying foxes (family Pteropodidae) as a delicacy. The Chamorro's insatiable appetite for bats has depleted Guam's flying fox population. The successive importing of bats for food has caused exploitation to expand beyond Guam. In Samoa, Palau, Pohnpei and Chuuk, flying foxes are becoming increasingly rare as this food trade increases (Rainey, 1990), with species such as Bumer's fruit bat (*Aproteles bulmerae*) going extinct (Flannery, 1989).

In the Philippines, an increasing human population is experiencing economic and social problems, putting immense pressure on natural resources. Logging and subsistence farming are causing deforestation (forests have been reduced to 6%), which reduces bat habitat, and flying foxes are used as a protein source. As a result, bats in the Philippines are threatened with extinction. Six of the eight species of flying fox on the island are endemic and all are experiencing shrinking populations (Heaney & Heideman, 1987).

In response to the rapid decline of bat populations, bat conservation groups have formed all around the world. In the USA, biologist Merlin Tuttle founded Bat Conservation International (BCI) in the 1980s, one of the most successful bat conservation organisations. Organisations like BCI are dedicated to the conservation of bats through education, research and habitat protection (Toops, 1995). The effort of bat groups has brought worldwide attention to the plight of bats while educating people about the benefits of and misconceptions about bats and that, despite all the negative myths, bats are harmless, intelligent animals (Toops, 1995). As a result, the popularity of bats has grown in some areas (Grzelewski, 2000; Morton & Murphy, 1995). In fact, based on people's growing interest in viewing bats as part of their vacations, BCI published its second edition of *The Vacationer's Guide to Bat Watching* in 2000.

Wildlife Tourism

Tourism is the world's number one employer, generating \$4 trillion-plus in economic benefits annually (Honey, 1999b), but there are environmental and social impacts with conventional or mass tourism. Ecotourism is defined as a low-impact, sustainable alternative to mass tourism, and is the fastest growing sector of the tourism industry (Western, 1994). Ideally, ecotourism offers a viable way to use, yet preserve natural resources while providing more long-term, and sometimes more profitable, economic alternatives to logging, agriculture or wildlife extraction (Honey, 1999b).

Wildlife tourism has become the leading foreign exchange earner in several countries, with as many as 211 million wildlife tourists worldwide in 1994 (Reynolds & Braithwaite, 2001; Roth & Merz, 1997). In the USA, wildlife tourism is growing annually by 25–30% (Roe *et al.*, 1997). Wildlife tourism (WT) includes three dimensions (Duffus & Dearden, 1990): (1) consumptive

(hunting, fishing, etc.); (2) low consumptive (zoos, aquariums, etc.); and (3) non-consumptive (wildlife watching, photography, etc.). NCWOR was listed as one of the 10 fastest growing recreational activities in the USA, with an expected growth rate of 61% by 2050 (Bowker *et al.*, 1999). A recent national survey in the USA found that 77 million adults, 40% of the adult population, participated in wildlife-related recreation, generating \$100 billion in expenditures (Youth, 2000).

Many species have benefited from wildlife tourism and perhaps even owe their survival to it. The need to protect a particular species has led to the incorporation of wildlife tourism as part of wildlife management plans. In the Windward Islands, three of seven endemic species of parrots have gone extinct and the remaining four are threatened with extinction. In order to derive an effective environmental management plan for the parrots that complements the island's socioeconomic goals, the government is exploring ecotourism as an option (Christian *et al.*, 1996). Wildlife tourism has been successful in helping many species of wildlife in Africa and the world's tropical rainforests (Boo, 1990; Lindberg & Hawkins, 1993).

The Tourist

Successful management of wildlife tourism is dependent upon a good understanding of the people who take part in the recreational activities. A variety of social science researchers have attempted to categorise nature-based recreationists in order to better understand who these people are. Researchers have categorised people according to the activities they most participate in (Cordell, 1999; Moscardo, 2000), as well as the motivations they list as the reasons why they participate (Palacio & McCool, 1997).

Although these categorisations are useful for NCWOR, Bryan (1977, 1979) characterised tourists according to their level of specialisation, which provided an effective discussion of the varying types of people who seek out wildlife during their leisure. Known as the leisure specialisation continuum, one end of the spectrum is anchored by specialists and the other end by generalists. Bryan described specialists as people who have a high degree of knowledge about a particular animal (e.g. birds, bats, butterflies), own expensive equipment to view that animal (e.g. spotting scope, camera and lenses, binoculars, field guides and other books), and devote extensive time to specifically participating in wildlife-watching activities. A generalist might be someone who is interested in a variety of wildlife (i.e. does not concentrate on birds, bats or butterflies) or visits many types of attractions (e.g. beaches, National Parks, theme parks) and wildlife viewing is just one activity of many activities they participate in (Pearce & Wilson, 1995).

Duffus and Deardon (1990) used this categorisation of visitors to discuss the evolution and management of NCOWR sites. They described sites that were initially used by specialists as areas that tended to have low infrastructure development and were difficult to access. As these sites became more popular, more infrastructure would be developed and access would improve to accommodate more general recreationists. Although the categorisations work well for the majority of wildlife, which require healthy, natural

environments, they are not as helpful in explaining many examples of bat tourism. Many sensitive species of bats, such as hibernating cave-dwellers, maternity colonies and non-colonial species of forest bats, would benefit from a stricter adherence to the management guidelines set forth by Duffus and Deardon (1990), such as baseline studies of the ecology of the area, behavioural and reproduction benchmarks for the species and location factors.

However, many species of bats, especially those more apt to attract recreationists and tourists, often thrive in urban environments. For example, some species of bats will form large colonies in bridges, stadiums, buildings and structures specifically designed for bats (i.e. bat houses). In places like the Congress Avenue Bridge in Austin, Texas and the University of Florida Bat House in Gainesville, Florida, bat colonies have thrived with large numbers of people visiting these structures in the evenings to see the bats emerge. Since viewing the evening emergence of a large colony of bats is predictable, impressive and easy to access, a diversity of people, who would otherwise not travel into natural settings to see wildlife, are more likely to take part in urban bat-watching opportunities. Therefore, in terms of the more gregarious species of bats that are not sensitive to crowds of people, bat tourism venues can be managed to successfully accommodate generalists, specialists who tolerate crowds and the focal species of interest, without deterring any of them.

This facilitated encounter is not only important because it provides unique learning and other psychosocial benefits to people, but it also offers an incentive for species protection. For example, researchers have documented a variety of psychosocial and conservation benefits. Whale watching was found to provide benefits such as excitement, peace and tranquility (Muloïn, 1998). Visitors to Penguin Place in New Zealand reported enhanced environmental awareness and as well as mood benefits (Schanzel & McIntosh, 2000), Kellert (1985) and McFarlane and Boxall (1996) found that people who often participated in birding were more likely to support conservation.

Wildlife encounters through wildlife tourism have the potential to change attitudes (Bixler *et al.*, 2002), which may lead to long-term species conservation. For example, children who were exposed to interpretative programmes about snakes showed a significantly positive attitude change, which did not erode over time (Ford, 1992; Morgan & Gramann, 1989). In addition, Ford (1992) found that children's attitudes did not improve for species that they were not exposed to. Therefore, there is potential for bat tourism encounters to improve people's attitudes toward bats as well as potentially increasing their support for bat conservation initiatives.

Recreational Impacts

According to Duffus and Deardon (1990), NCWOR requires predictable occurrences of a focal animal within a fairly small spatial area. Therefore, successful wildlife viewing areas often involve a location where some predictable aspect of animal life occurs, such as a watering hole, a heron rookery, a beach where sea turtles nest, or a salmon run for bears. These sites can be natural or artificial, such as feeding stations and salt licks. For some species, their

behaviour might not provide predictable occurrences for sightings, as with wolves who travel expansive territories.

Bats fit well into these criteria of NCWOR. Many species of bats are gregarious, colonial species, roosting in large colonies within proximity to humans. These bats have a predictable emergence time in the evening and can often be readily viewed by a number of people. However, a gathering of wildlife watchers at areas where predictable sightings occur can, if not properly planned and managed, lead to significant negative impacts to the animal (Hammit & Cole, 1998). In fact, in the USA there have been cases where outdoor recreation has been seen as a cause of species endangerment (Czech & Krausman, 1997). For example, a variety of research has shown that bird watching, often considered a low-impact recreation activity, might disturb birds' nesting habitats, resulting in damage to eggs or death to nestlings (Larson, 1995).

Although some bat species respond well to tourism initiatives, other species, such as some cave-roosting bats, are vulnerable to disturbance in their roosts, especially during hibernation and the birthing season (Thomas, 1995). During hibernation bats naturally lose weight, but human disturbance can exacerbate weight loss, resulting in mortality (Johnson *et al.*, 1997; Tuttle, 1994). A study of the effect of cave tours on a maternity colony of bats found bats to be negatively impacted by light and noise (Mann *et al.*, 2002).

As with all wildlife recreation, bat watching must be well planned, and management should be based on legitimate scientific research to ensure bat populations remain sustainable. This requires the involvement of state and federal agencies, bat conservation groups and/or wildlife researchers when developing bat tourism projects. These experts are vital to obtain proper permits, assess the risk to the species, and aid in developing a management plan. For example, in Yucatan, Mexico, a study was conducted on the location and needs of cave-dwelling species to make recommendations for development (Arita, 1996). For vulnerable and endangered species, metal bars that prevent cave intrusion may be necessary. Cave bars were successfully implemented at Hubbard's Cave in Tennessee to ensure the safety of a large colony of endangered grey bats (*Myotis grisescens*; Morton & Murphy, 1995). However, care must be taken that cave bars do not alter the temperature of the cave (as this can lead to mortality) and that cave bars do not overly restrict flight patterns and the use of the sites by bats (Ludlow & Gore, 2000; Richter *et al.*, 1993).

The Host Tourism Community

One of the four essential prerequisites to WT according to Barnes *et al.* (1992) is that local communities benefit from tourism-generated income to provide an incentive to protect wildlife and habitat. There are many examples of WT providing community benefits. In Bwindi Impenetrable National Park in southwest Uganda, community-based WT has been instrumental in protecting the last 300 of a subspecies of eastern mountain gorillas while providing economic and other benefits to the local community (Lepp, 2002). When the area became a national park, the people living in the vicinity were moved away so they would not convert the area into farmland. Even though these itinerant Ugandan people suffered from an increasing population, a ban on the export in fish,

and a drop in coffee prices, the local residents supported the relocation because the gorillas generated 1.5 million pounds sterling per year through tourism. Therefore, this alternative economic industry provided a better life than what these local Ugandans previously experienced. For example, funding for small-scale enterprises, community projects such as schools, health clinics, roads and conservation education come from 20% or less of the total park entrance fees (Salt, 2000).

Bat populations provide economic value beyond tourism revenue (Morton & Murphy, 1995). In southwestern Thailand, bat guano can be sustainably mined from bat colonies as a major source of income for local communities. However, poaching of bats once caused a decline in guano – decreasing sales by 50%. In response, villagers hired a game warden to protect the bat cave where the guano was mined. BCI provided interpretive materials to educate local residents about the bats, including the benefits bats provide to the community. Eight years later, the guano production increased from \$12,000 to \$88,600 annually. As the bat colony increased in size, busloads of tourists were attracted to the nightly emergence, providing another source of income to local vendors (Morton & Murphy, 1995).

Successfully integrating wildlife tourism, or any form of nature-based tourism, into a community must be done in collaboration with local residents and be perceived to benefit the community (Stein *et al.*, 1999). For example, the city of McAllen, Texas, has turned to birders to boost the economy. In one year, 40,000 birders added \$45 million to the economy and supported 589 jobs. The flocks of birders have also led to local wildlife-friendly initiatives such as land acquisition for preservation and the creation of butterfly and hummingbird gardens, and sustaining a Director of Nature Tourism position for the Chamber of Commerce (Burley, 1998). By contrast, when the needs of the community are ignored, the community might resent and even protest tourism. This was the case with the Massai people in Kenya, who were exiled from Nairobi and Amboseli National Parks, and subsequently protested tourism by killing wildlife (Cater, 1993).

Bat Conservation and Tourism Initiatives

Conservation efforts are helping bat populations grow worldwide. An increasing number of individuals and organisations are erecting bat houses in hope of luring the voracious insect eaters into their yards (Toops, 1995). The National Park of American Samoa, an 8000-acre park covering three islands, was established in 1988 to preserve the fa'asamoa ('the Samoan way') archaeological sites, coral reefs and the flying foxes within the park, which was also posited as a major benefit of creating the park (Merewood, 1992; Stein, 1997).

In Gainesville, Florida, when the University of Florida needed to exclude a large number of bats from a sports stadium, the University built one of the largest bat houses ever constructed. The Lake Alice Bat House can hold several hundred thousand bats and currently houses over 120,000 bats (Ken Glover, personal communication, 12 July, 2004). Each evening, dozens of spectators gather to witness the streams of Brazilian free-tail bats (*Tadarida brasiliensis*) begin their nightly flight. The success of the house has encouraged

other cities, including three in Florida – Tallahassee, Port St. Lucie and Tampa – to build bat houses.

One of the world's most successful bat conservation initiatives is the Congress Avenue Bridge in Austin, Texas. When the bridge was remodelled in 1980 and bats began to move into its crevices, concerned citizens, who thought the bats would pose a danger, began petitioning to have the bats removed. A media campaign from conservationists was able to successfully change opinions. The bridge is currently home to 1.5 million Mexican free-tailed bats (*Tadarida brasiliensis*) whose nightly emergence is estimated to attract nearly 140,000 visitors each year. The direct economic impact of the bat watchers is conservatively estimated at \$3.2 million with an overall impact estimated at \$8 million (Ryser & Popovici, 1999). The site in Austin is particularly unique for a wildlife-viewing site as it is located downtown in the centre of the city. This provides urbanites access to a memorable wildlife-watching experience, something more typical to rural areas. Bat viewing has led to creation of a grassy viewing area with educational kiosks, several river-boat operators offering bat-watching excursions, and a bat festival, 'Free-Tail Free-For-All' sponsored by the Austin American-Statesman newspaper and BCI.

Bat viewing has become so popular that BCI's (2000) 2nd edition of *The Vacationer's Guide to Bat Watching* lists 125 of the best places to view bats in the USA and Canada. The guide includes areas where the nightly emergence of bats can be seen, organisations that give educational programmes on bats, and museums and zoos that have educational exhibits. Bat viewing sites in the USA include The Nature Conservancy's Eckert James River Bat Cave in Texas, home to 3–6 million Mexican free-tail bats (*Tadarida brasiliensis*), Jewel Cave in South Dakota, Carlsbad Caverns National Park in New Mexico, Selman State Park in Oklahoma and Kickapoo Cavern State Park in Texas, all of which offer bat-viewing tours and bat educational programs. Some of the zoos and museums listed in the guide include the Metro Washington Park Zoo in Portland, which exhibits six species of African fruit bats, the Royal Ontario Museum, with a partial reconstruction of an actual cave in Jamaica housing seven Jamaican bats, and zoos with walk-through exhibits containing free-flying bats, such as the Brookfield Zoo in Chicago.

Bat tourism sites are continually being located and developed. For example, in Australia flying foxes can be seen at the Royal Botanic Gardens in Sydney and nearby Cabramatta Creek Flying Fox Reserve, and tens of thousands of bent-wing bats can be watched in Mt Etna Caves National Park in Queensland. Recreationists can see bats in the caves of Barra Honda National Park and Hacienda Baru' National Wildlife Refuge in Costa Rica, and in Belize over 20 species of bats are found in Five Blues Lake National Park and several lodges offer bat watching. Festivals featuring bats include the Eurobats festival celebrated in each of 24 participating countries (Eurobats, 2004), the Yuma Birding and Nature Festival in Arizona and the Free-Tail Free-for-All in Austin, Texas. There is even a Bat World in Mineral Wells, Texas, that provides rehabilitation and education about bats and has been successful in converting much of the town, even business owners, to bat house enthusiasts.

BCI began offering bat tours throughout the world in 1988 and has included trips to Canada, Costa Rica, Venezuela, Arizona, Belize, Kenya, Botswana, Zambia, Borneo and Australia. BCI has also teamed up with the New York Botanical Gardens to offer a bats and birds tour of the Amazon. The trips are so successful that the 2001 Amazon trip sold out before it was advertised (Bob Benson, personal communication, 2001).

Conclusion and Suggestions for Future Research

Bats are beneficial to ecosystems around the world and are often keystone species. However, bat populations are dwindling worldwide and conservation efforts are desperately needed as many species are losing ground, listed as threatened or endangered and becoming extinct. Bat tourism has enormous potential to conserve bat populations while providing social and economic benefits to the people in host communities. As the examples in this paper illustrate, bat tourism initiatives have been successful in many cases, providing working conservation initiatives that have benefited bats, local economies, habitats and other species in the effort to save bats. Therefore, bat tourism initiatives should be explored and implemented in other areas where bats, local economies and native people could benefit from such ventures, as may be the case in the Philippines and Micronesia. Bat tourism can provide many benefits to conservation and local economies, especially in developing nations if managed in accordance with the framework discussed (Duffus & Deardon, 1990; Smyth, 1998).

However, further research is needed to better understand recreational visitors' impacts on bats and whether those impacts are different in urban vs natural areas. In particular, research should assess the feasibility of bat conservation initiatives through tourism on a case-by-case basis, and the effects of tourism should be closely monitored, especially with vulnerable species. Social research is needed to determine if bat watching venues lead to improved attitudes toward bats, bat conservation, and conservation in general. Such research into the attitudes of bat watchers would also need to determine what factors of the recreational experience contribute to the positive benefits of education, attitude and behaviour change and if those factors differ for recreationists with varying motivations for visiting a site. Perhaps such venues could lead to the formation of more positive (biocentric) attitudes as recreationists learn about the benefits of a species once so commonly hated by humans around the world. Finally, the success of bat tourism initiatives would benefit from tourism marketing research designed to determine how tourists perceive bat watching as fitting into their vacations and their motivations for viewing bats.

The need to sustain bat populations and expand human awareness provides emerging opportunities in many areas around the world. The benefits to bats, ecosystems, recreationists and local communities serve to make bat tourism initiatives a win-win situation for all.

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