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Bats of the Cayman Islands
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Band, Anne-Louise

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by Anne-Louise Band

The Caribbean is renowned for its beautiful beaches and exotic island retreats, but few people realize how severe the pressure of tourism and development is on this area. Only two decades ago, the Cayman Islands hosted just 400 visitors a year. By 1997, that number had risen to four million. It is among these many people that eight species of bats must make their homes and survive.

My passionate interest in the Caymans' bats began four years ago in a rather unexpected way. After receiving a Master's degree in wildlife biology from the University of Montana, I was very interested when a close friend told me that BCI's Merlin Tuttle was giving a slide program on bats at our local art museum. I had always been intrigued by creatures with bad reputations such as snakes and salamanders, and in graduate school I had studied small mammals and ecosystem health.

After Tuttle's presentation, bats appeared to me as the most diverse, mysterious, and fascinating mammals on earth. Here was a creature I could study and teach about for the rest of my life! The next day, Tuttle hosted a local bat conservation workshop. I attended, and the rest is
history.

In 1997, through BCI, I contacted the National Trust for the Cayman Islands after hearing they were looking for someone to monitor bats. Dedicated to preserving the natural and historic heritage of the islands, the National Trust supported my research by providing transportation, housing, equipment, and airline tickets. With additional help from BCI, I was on my way.

Located in the British West Indies, the Caymans are a small chain of limestone substrate islands 90 miles south of Cuba. Grand Cayman is the largest and most developed, with a population of 30,000 full-time residents on the 79-square-mile island. Little Cayman is flat and only 18 square miles; Cayman Brac is slightly larger, at 20 square miles. Both of the smaller islands remain relatively undeveloped, but this situation may not last.

Although bats are the Cayman Islands' only native mammals, they are poorly understood, unappreciated, and often persecuted. Many locals believe bats are flying vermin that depredate local fruit farms. Along busy Seven-Mile Beach on Grand Cayman, where most tourists stay, bats in roof spaces or attics are considered harmful to business and are often exterminated. Lois Blumenthal, a local conservationist, initiated the Bat Conservation Programme of the National Trust in 1994. She has made impressive progress in changing local attitudes by creating and distributing pamphlets and classroom materials and giving presentations, but age-old beliefs die hard.

I worked on public education with Lois as much as possible while in the Caymans, but my objective was research. In the past two decades, bat research in this area has focused on fossil records, physiology, and distribution. Virtually nothing is known about bats' roles in the complex ecology of the islands. Fortunately, the National Trust

recognizes the need for such information, especially in light of population declines observed in known bat roosts.

Cayman bats are small, averaging less than two ounces (50 grams). There are two common species, the Jamaican fruit bat (*Artibeus jamaicensis*) and Pallas's mastiff bat (*Molossus molossus*). The remaining six species are now uncommon or extremely rare, including the Cuban fig-eating bat (*Phyllops falcatus*) and the buffy flower bat (*Erophylla sezekorni*), a long-nosed species that specializes in nectar and pollen feeding. Exactly half of the Caymans' bats are insect eaters, and the other half feed on fruit, nectar, and pollen.

Studying bats meant that my hours were less than ordinary. Upon arrival in the Caymans, one of the first things Jon (my field assistant and husband) and I did was to visit some of the better-known caves. Much to Jon's chagrin (I think beaches, blue water, and sun figured highly in his expectations of the Caymans), most of our days were spent trekking at a rate of one-tenth of a mile per hour through the near-impenetrable bush. By day, we searched for roost sites and fruiting or flowering trees. Evenings were spent at mist-nets or surveying with a bat detector.

When queried about local topography, cave sites, and woodlands, locals most often replied, □Dere's nuthin' over dere □cept de bush.□ □De bush□ proved to be far more interesting than the locals described. Vast expanses of friable limestone rock resembled razor-sharp teeth sticking straight up from the earth, which shattered underfoot with the sound of breaking glass. Across the rocky obstacle courses were other challenges, including thick tangles of plants (many from the spiny cactus family), encounters with hundreds of ticks resulting in a raging bout of tick fever, and swarms of mosquitoes, which invariably kept me company on my late-night mist-netting vigils. More often than not, the mosquitoes simply took up temporary residence inside my headnet, where they could comfortably feed for hours.

Given the animosity of local Caymanians toward bats, as well as public misinformation, I felt that documenting bats' feeding habits would be helpful in prioritizing future conservation efforts. This meant I spent a lot of time rooting around caves and attics in the sweltering tropical heat collecting fecal matter. I also identified feeding roosts and collected uneaten insect parts from these sites. After capturing bats in mist-nets, I palpated their abdomens to encourage defecation. This inglorious process added much to my knowledge about the bats' diets. Insectivorous bats, particularly Pallas's mastiff bat, consumed numerous species of noctuid moths and beetles, as well as mosquitoes. Waterhouse's big-eared bat (*Macrotus waterhousii*) ate larger insects, and much of the winter diet of this species consisted of large sphinx moths and dragonflies.

I learned little about the insectivorous diets of the Caymans' endemic subspecies of big brown bat (*Eptesicus fuscus*) and of the Brazilian free-tailed bat (*Tadarida brasiliensis*) because few were seen or captured during my time in the islands. All historic roosts of the big brown bat are currently abandoned, and the site of the largest known colony of Brazilian free-tailed bats is also deserted. Known as □The Bat Cave□ by locals, this roost once housed as many as 30,000 free-tailed bats. The current director of Cayman's National Botanic Park, Teddie Ebanks, recalls bats swirling overhead in the cave, sounding like a helicopter taking off. He adds that he used to stand breast-high in bat guano, which he mined as fertilizer for his uncle. By the 1980s, bat numbers in the cave were down to several thousand, and in the winter of 1998, I found no free-tailed bats at all in the cave.

The fruit- and nectar-eating species of this area play key roles as seed dispersers of pioneer species□plants that can thrive in disturbed and deforested areas. The Jamaican fruit bat and the Cuban fruit-eating bat (*Brachyphylla nana*) eat many kinds of fruits native to the Caymans, including yellow mastic, bitter plum, Indian almond, wild cocoplum, ginep, palm nuts, cerasee, parrotberry, and strawberry-tree fruits. These two bat species also eat cultivated and naturalized fruits such as neesberry, mango, papaya fruit and leaves, rose-apples, guava, and avocado.

The neesberry fruit is a valuable cash crop, and these two bats sometimes prey on green, unripe neesberries as well as ripe ones. Neesberries cannot be picked when unripe because it ruins the flavor of the fruit. Thus, the bats are causing losses to neesberry farmers. This fruit depredation leads many farmers to attribute more serious fruit

damage by other animals, such as rats or parrots, to bats. I worked hard to educate the farmers about fruit bats, in an effort to help them understand that normally bats eat only fruits that are too ripe for human consumption. However, ideas about bats in the Caymans are deeply rooted, and will not be easy to change.

I also attempted to help the farmers find a solution to their problem. So far, tree-netting and recorded owl screeches have proven ineffective. Solving the fruit predation problem on the islands will go a long way toward engendering positive feelings toward bats among local farmers.

In addition to studying feeding habits, I compared the results of bat-detector and mist-net surveys between disturbed and undisturbed habitats. The highest levels of bat activity were found in mature mangrove swamps, at lit streetlamps in undisturbed areas, and at fruit farms. The lowest levels were in highly disturbed areas such as urban and suburban sites and recently slashed-and-burned forests. Diversity of bats was highest in mature woodlands and mangrove swamps.

The next phase of my research will explore more specific bat-insect relationships. Based on my initial surveys, I suspect that insectivorous bats in the Caymans may be major controllers of night-flying agricultural pests. I will try to document bats feeding during hatches of specific insect pests on farms. The army cutworm moth is present in the Caymans, along with numerous other crop-damaging insects, and if we can demonstrate that bats are targeting pests such as these, we will be better able to enlist farmers as bat conservationists.

One encouraging development in the Caymans is Lois Blumenthal's success with bat house construction and research over the last three years. At the end of 1999, Blumenthal had 41 houses at a variety of sites across Grand Cayman, with 46 percent of these occupied. Through careful data analysis, she has determined the optimal colors and placements for houses in her area, and she has enlisted everyone from convicts to the Caribbean Utilities Company in her efforts. The islands' most common house-dwelling species, Pallas's mastiff bat, appears to take very well to bat houses. However, this is the least threatened of the Cayman bats, and progress with bat houses should in no way preclude critical habitat protection.

The grim reality is that this special and beautiful nation is undergoing dramatic and irreversible changes. Development interests, rapid clearing of land, and dredging and filling of mangrove swamps threatens the integrity of the Cayman Islands' fragile ecology. The government's Department of the Environment is concerned, but primarily active in marine conservation. The National Trust has been influential in directing zoning laws, and is working to protect relatively pristine areas, particularly the mangrove swamps. They have also taken the initiative in declaring and protecting endangered species, such as the Cayman blue iguana. With their continued dedication—and faith in the contributions of individual conservationists—perhaps a shift in attitude will encourage Cayman residents to preserve the remaining crucial habitat for bats and other wildlife.

Anne-Louise Band is a wildlife biologist from Wilson, Wyoming. Although there are too many contributors to list individually, she would like to thank all those who assisted with her research and continue to support conservation in the Caymans.

By examining fecal samples, the author found that Waterhouse's big-eared bats eat sphinx moths (pictured), as well as other large insects. Merlin D. Tuttle / 710-1301

The author introduces a Pallas's mastiff bat (inset) to the students of Grand Cayman's First Baptist School. Because rabies is not present on the island, the children are allowed to gently touch the bat's soft fur.

The resemblance in ears and mouth between this species and the Mexican free-tailed bats pictured on pages 1-4 is because both are from the family Molossidae (free-tailed and mastiff bats), found in warmer climates worldwide.

The Cuban fruit-eating bat (left) and the buffy flower bat (far left) are both primarily cave-dwellers, roosting in colonies of hundreds to thousands, and both have varied and opportunistic diets of fruit, nectar, and pollen, as well as occasional insects.

The National Trust for the Cayman Islands is helping conserve swamps and other wildlife habitat on this small and fragile island chain.

All articles in this issue: