Surprising Migrations of Tri-colored Bats

Bat Conservation Begins in Bangladesh

Critical Bat Areas Win Support in Latin America

Bat Conservation Across Africa
f you were a fine young fellow or lady of good family and fortune in the court of English King Henry VII, indispensable to your royal chitchat was *The Book of St. Albans*, published in 1486.

In addition to indispensable trivia on hawking and heraldry, *St. Albans* put forth the colorful collective nouns that still pop up in party conversation — a flock of crows is a *murder*; ferrets gather in *businesses*; and groups of jellyfish and cats are, respectively, *smacks* and *clowders*.

And what of bats? Bats, then as now, suffer from bad PR. You might expect a *bevy* of bats, but no — *bevy* is reserved for larks. Bats merit only *colonies* or *clouds*. Lest we go another 400 years with such pedestrian bat terms, I propose we embrace a new descriptor, a *prosperity* of bats.

If you’re a member of BCI, you know why. Bats are important pollinators in the southwestern United States and around the world. Fruit bats’ dispersal of seeds is key to the rainforest regeneration. Insectivorous bats consume billions of moths and other insects every night. A study published in *Science* of “ecosystem services” provided to agriculture by bats estimated that bats provide about $23 billion/year in chemical-free pest management in the United States alone. A 2006 study in eight south-central Texas counties showed bats save cotton farmers about $750,000/year, arguably making bats the difference between profit and loss.

Surprisingly, few other studies have been done on bats’ economic and ecological value. So bats remain under-valued in most of the world and by many of those who gain the most. In my home state of Pennsylvania, hard hit by White-nose Syndrome, mortality for little brown bats is above 98 percent. Yet the agriculture industry there has remained silent on listing the little brown bat and other WNS-decimated bats as state-endangered.

Think how persuasive studies on the benefits of such bats to Northeast farming could have been — but such studies don’t exist and can’t be done now that these once-common bats are gone from the landscape. Stimulating such research elsewhere will be a global priority for BCI in the months and years ahead.

All of us who love and appreciate bats have a role to play in changing public perceptions. I began this column on a light note, but the issue is all-too-deadly serious. We have only an inkling of bats’ importance to the ecosystems in which we and they live. Like rejuvenating fire in the pine barrens or nutrient-rich spring floods in an estuary, bats themselves may be a landscape-scale ecological process that helps define and sustain some ecoregions. It’s an intriguing and not altogether far-fetched notion, one that bears more attention from the scientific community.

In the meantime, at your next party, royal or otherwise, try remarking on the *prosperity* of bats you witnessed on your last vacation. It might catch on.

**The Memo from our Executive Director**

Veteran conservationist Andy Walker, formerly of The Nature Conservancy and the New College Foundation, where he was president and CEO, became Executive Director of Bat Conservation International on January 30, 2013.

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COVER PHOTO: Straw-colored fruit bats (Eidolon helvum) are perhaps the most iconic bats of Africa. Their seasonal migrations span much of the continent—and so does the new Bat Conservation Africa network that was created with BCI’s support in February 2013. See page 6.
PHOTO © MERLIN D. TUTTLE, BCI / 0010431

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tri-colored bats are among the most common bats in much of eastern North America, yet relatively little is known of their seasonal travels among summer roosts, swarming sites and hibernacula. Our research goal was to apply new technology to old museum specimens (collected between 1878 and 1986) to investigate the unusual migrations of tri-colored bats – making us feel kind of like cold case detectives.

Our study, funded in part by Bat Conservation International Student Research Scholarships, indicates a fundamentally different picture of migratory behavior than has been previously assumed for this species.

Known until recently as eastern pipistrelles, the little insect-hunting tri-colored bats (*Perimyotis subflavus*) roost during the summer months alone or in small, female-only colonies in buildings or foliage. In the autumn, they travel to “swarming sites,” usually caves or abandoned mines. Each night for as long as several weeks, hundreds, sometimes thousands, of bats gather in and around swarming sites in a truly spectacular sight. This is when mating occurs.

Tri-colored bats hibernate during winter, also in caves or abandoned mines. As with a number of other bat species, females store viable sperm throughout the hibernation season, then ovulate and become pregnant after emerging from hibernation in the spring.

Although there is little information about tri-colored bats’ movements among summering grounds, swarming sites and hibernacula, they are generally believed to be short-distance, regional migrants who move across the landscape in all directions as they travel among sites.

However, seasonal variation in abundance and sex ratio within local populations has led some researchers to suspect these bats may migrate across significantly longer distances as “latitudinal migrants” that travel south in the autumn (in this case to hibernation sites), then return northward in the spring. Another species considered to be a latitudinal migrant, the hoary bat (*Lasiurus cinereus*), may migrate more than 1,250 miles (2,000 kilometers) one way.

A better understanding of the migratory patterns and range of the tri-colored bat is essential for effective conservation decisions. Not only is the species among those battered by White-nose Syndrome, but tri-colored bats account for a substantial proportion (perhaps as much as 25 percent) of bat fatalities at some wind-energy facilities. Current evidence suggests bats are most likely to be killed by wind turbines during long-range migrations across latitudes.
Biologists in the past mostly studied migratory bat movements primarily by banding, which involves catching bats, attaching small bands to their wings, then hoping to recapture a few of those banded bats months later. The analogy of seeking needles in haystacks comes to mind.

The addition of stable isotope analysis to the biologist’s toolkit has made another approach to migration studies possible. This technique is now widely used for investigating the origins of many migratory animals. In 2004, Paul Cryan of the U.S. Geological Survey used it to describe hoary bat migrations (see “Chemistry and Migration Mysteries,” BATS Fall 2004).

This powerful technique measures the relative abundance of two stable isotopes of hydrogen in a tissue sample. Different isotopes of the same element have the same number of protons, but vary in atomic mass because of differing numbers of neutrons in the nucleus of each atom. Hydrogen, the simplest element, has two stable isotopes: protium and deuterium.

When water-saturated air masses form in the tropics and move across the landscape, deuterium (the heavier stable hydrogen isotope) condenses to form precipitation more readily than protium. Although other factors are also involved, as a general rule, the ratio of deuterium to protium in rainwater decreases as the air mass moves from the tropics toward the poles.

As an animal’s tissue grows — fur in this case — it incorporates the stable hydrogen isotope composition of its food and drinking
water. Once new fur has grown, this ratio will not change. Since many bat species replace their fur annually during summer/fall, the stable hydrogen isotope composition of fur collected outside of the period of fur growth can provide information about the bat’s location when new fur was growing.

The average stable hydrogen isotope compositions of precipitation during different seasons have been estimated and published for locations around the world at waterisotopes.org, which we utilized for our study.

Obtaining hair samples from tri-colored bats throughout their far-flung range is a daunting challenge. We received help from four museum mammal collections across North America. They provided tiny fur samples from the specimens in their collections, along with information on when and where each was obtained. Collection information for all of our 184 samples spanned all seasons at latitudes across most of the species’ known range. We conducted our stable isotope analyses at the Laboratory for Stable Isotope Science at Western University in London, Canada.

Based on data from male bats, we calculated that new fur growth occurs between June 23 and October 16, although sample limitations suggest the end date could be as early as September 9. We assume the same dates apply to female tri-colored bats. The stable hydrogen isotope composition of bat fur collected outside of the time of new fur growth can help us to infer north-south movements of individual bats.

Our results indicated that 24 of 73 males (33 percent) captured outside the period of new fur growth were south of the location where they grew their fur; only one male showed evidence of having moved north. Five of 32 females (16 percent) sampled during the non-molt period indicated some southern movement and two may have moved north. For the most part, the distances traveled by female migrants appeared to be less than those of male migrants.

Based on these results, we conclude that, contrary to previous hypotheses, at least some tri-colored bats of both sexes do indeed

Bat research goes high-tech: This mass spectrometer was a key part of the isotope analysis used in Erin Fraser’s study of the migrations of tri-colored bats.
engage in longer-range, north-south migrations that have more typically been associated with hoary bats, eastern red bats (*Lasiurus borealis*) and silver-haired bats (*Lasionycteris noctivagans*).

All of the female migrants and most of the male migrants were captured at the northern end of the species’ range, north of 40 degrees (roughly the latitude of Philadelphia). This seemed surprising, as we found that bats that were already near the northern extent of the known range appeared to have migrated south – from locations even farther north.

Also, the bat whose stable isotope composition indicated that it had traveled the farthest also had the most northern stable isotope signature. This male was collected in southwestern Ontario and its stable isotope signature indicated it may have grown its fur at a higher latitude than has been previously recorded as within the range for this species.

Why would bats at the northern extent of the species’ range be making north-south migratory movements? We found this migratory pattern more often among males than females. Sex-biased migratory behavior is common among bats, but it usually involves females moving farther than males. Our finding that male tri-colored bats are more likely to be long-range, latitudinal migrants may reflect reproduction-based energy requirements.

Females ovulate and become pregnant after emerging from hibernation in the spring and face increased energy needs throughout pregnancy and lactation in early to mid-summer. It may not be energetically possible for females to undertake a long migration at that time, and more northern latitudes may not be the best place to give birth and raise their pups.

Conversely, male reproductive costs occur in late summer when they produce sperm, and they may benefit from migrating to more northern summer habitats before that occurs.

In winter, bats may need to migrate south from extreme northern latitudes to hibernacula where winters are shorter and hibernation is less energetically expensive.

Our research indicates that the migratory behavior of tri-colored bats is more complicated than previously assumed, with substantial variation between sexes and across the species’ range. At least some individuals appear to engage in substantial latitudinal migrations that had not been previously documented for this species.

**ERIN FRASER** completed her Ph.D. at Western University in London, Ontario, where she used stable isotope techniques to study migration in several species of North American bats. She is currently an Assistant Professor in Biology/Environmental Science at the Grenfell Campus of Memorial University in Canada.

**Acknowledgements**

The author gratefully recognizes these mammal collections, which provided fur samples for this study: Royal Ontario Museum, Louisiana University Museum of Zoology, Harvard Museum of Comparative Zoology and Cornell Museum of Vertebrates.
A handful of dedicated, homegrown conservationists have been working quietly and tenaciously against long odds to build outposts for bat conservation around much of Africa. Although rarely noticed by the rest of the world’s bat researchers and conservationists, their impact and their numbers have been growing slowly but steadily. Now, with a united leap forward in February, they are no longer isolated. And they aren’t likely to go unnoticed much longer.

Thirty bat specialists from 19 African countries worked together during an intense, weeklong African Bat Conservation Summit in Kenya, their first joint meeting ever, and created a continent-wide collaboration — a new network called Bat Conservation Africa (BCA).

“I never imagined that Africa had such talented and passionate bat researchers. This congress made me realize that African bats have their champions,” said participant Vikash Tatayah of the Mauritian Wildlife Foundation in Mauritius, an island nation about 1,250 miles (2,000 kilometers) off Africa’s southeastern coast.

BCA is uniquely African, but it incorporates modified elements of existing bat-conservation networks. A dozen conservationists from the United States, Latin America, Europe and Australia shared their experiences in building similar networks in Latin America, Southeast Asia, South Asia and elsewhere. (See “Critical Areas for Bat Conservation,” page 10.)

“This is an historic milestone, which marks a new era for bat conservation on the African continent,” said Dave Waldien, BCI’s Director of International Programs. “It is an honor to work with people so dedicated to bat conservation.”

Bat Conservation International initiated the summit,
provided core financing and travel expenses for many of the delegates, and worked with key partners to organize the unprecedented meeting at the Kenya Wildlife Service Training Institute in Naivasha.


The participants discussed at length the many challenges that have for years complicated and slowed bat conservation work in Africa. Some countries simply lack anyone with expertise in bat biology and conservation, and those few working for bats in other countries are largely isolated and ignored. Funding is always very limited, equipment such as bat detectors and mist nets is in short supply and training opportunities are rare. A major problem is that few African conservationists have the expertise to write and submit effective proposals for grants and other funding.

Ultimately, the network hopes to improve communication and collaboration among the dedicated but widely scattered conservationists of Africa and their partners around the world, to identify key bat-conservation priorities and build conservation capacity through education and training across the continent.

The immediate needs are to develop a Bat Conservation Africa website (a virtual headquarters) and an accessible list of members and their skill sets to enhance the sharing of ideas and data that marked the summit.

“There is a long list of things we need to do, but we have a very good plan and a lot of good people on our team,” said Robert Kityo of Uganda’s Makerere University. “Working together, we shall make this happen.”

Kityo, who was elected to chair the BCA steering committee, recalled that “when I first started working with bats in about 1987, it was very hard to find anyone in Africa who was doing bat work. It was very humbling. But over the years, our capacity has really grown.”

The network, he said, will provide a microphone to amplify a shared message for bat conservation. “In the course of this week, we have built up a lot of momentum and collected a lot of good ideas. We must not leave those ideas behind. We must take them with us and make them work. We’re going to make some mistakes, and we’re going to learn from them.”

Participants split into smaller groups to discuss specific questions during the summit, and the panelists often found the grounds of the Kenya Wildlife Service Training Institute provided an especially pleasant outdoor meeting hall.
Other members of the steering committee, each representing a continental region, are Vice Chair Iroro Tanshi of the University of Benin in Nigeria (Western Africa); Eric Bakwo fils of the University of Maroua in Cameroon (Central Africa); Julie Razafimanahaka, Director of Madagasikara Voakajy in Madagascar (West Indian Ocean Islands); and Ernest Seamark, Director of AfricanBats in South Africa (Southern Africa). Kityo represents Eastern Africa, and the Northern Africa seat will be filled later.

“Africa is a crucial frontier for bat conservation,” said BCI Executive Director Andy Walker. “It is home to over 20 percent of the world’s more than 1,250 bat species, yet bats have been largely ignored in favor of Africa’s more charismatic megafauna – the lions and elephants that intrigue the public. But the commitment and enthusiasm of the local conservationists at this summit promise a much brighter future for these invaluable flying mammals.”

Bats are critical for the ecological and economic health of Africa. Many species help protect agricultural crops by consuming huge quantities of insect pests, while fruit- and nectar-eating bats pollinate important plants and scatter seeds that help restore damaged forests. Yet bat populations are declining in much of Africa due to loss of habitat, disturbance of cave roosts, overuse of pesticides and, in some areas, bushmeat hunting. And bats are widely feared because of myths linking them to witchcraft and evil spirits.

Bat Conservation Africa is a first, giant step toward meeting some of those challenges. “We have strong goals, but now we’ve got to follow up and make them happen,” Tanshi said. Otherwise, it’s just going to be another meeting that doesn’t change
African Bat Conservation Summiteers took a cordial break during their intense week to visit Lake Nakuru National Park. The cameras came out and participants from around the world were mesmerized by the wildlife.

Robert Kityo, who stood before a whiteboard that bore the words “BE REALISTIC!” during his presentation, added a key point: “We must build a strong capacity for fundraising. That’s what makes our dreams possible.”

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One of the world’s leading bat biologists, Paul Racey of the University of Exeter in the United Kingdom, described “almost all of Africa” as part of a “bat-conservation void” during the 2010 International Bat Research Conference at Prague (BATS, Spring 2011).

“I was wrong,” he said as the Kenya summit was ending. “What had appeared to an outside observer to be a conservation void turns out not to have been a void at all because of the enthusiasm of individuals like these for bat research and conservation in many African countries.

“From little acorns very big trees can grow. We must ensure that this acorn – Bat Conservation Africa – germinates and is nursed to maturity.”


Now, as the scattered bat champions of Africa become a unified network, more than 250 bat species should benefit from the power of commitment and collaboration.

ROBERT LOCKE is Director of Publications for Bat Conservation International and Coordinator of the BCI Student Research Scholarships and Global Grassroots Conservation Fund.
More than 360 bat species are spread across Latin America, and they are as varied as the remarkably diverse ecosystems they inhabit—and help to sustain. Landscapes range from the deserts of northern Mexico to rainforests of the Amazon, from coastal areas of the Caribbean to the flooded savannas of the Pantanal and the rugged Yungas mosaic of the Andes’ eastern slope. Several are considered biodiversity hotspots—sanctuaries for numerous species, many of them found nowhere else. Bats are among the most important ecological players, yet they face severe threats throughout Latin America.

Within each of these ecosystems, bats fulfill crucial ecological roles. In addition to helping to control insect pests, scientists estimate that at least 800 Neotropical plant species depend on bats for pollination and/or seed dispersal.

Yet their great ecological and economic value is largely ignored, as bats are despised throughout much of the region and routinely blamed for rabies and other maladies. Vampire bats present a huge problem, although only three vampire species exist (all of them in Latin America). The common vampire (Desmodus rotundus) feeds on the blood of mammals, including livestock, and often comes into conflicts with cattle producers and other humans. Formal and informal campaigns to destroy vampire bats and their roosts inevitably damage habitats of beneficial species and kill countless valuable bats. And, of course, these bats face the continuing loss of habitat to expanding human populations, farms, ranches and timber harvests. It is not surprising that a number of Latin America bats are at severe risk of disappearing from their fragile ecosystems, along with the critically important ecological services they provide.

These regional risks led in 2007 to the creation of the Latin American Bat Conservation Network (RELCOM), which now includes bat-conservation organizations in 19 countries. Our goal is to magnify our individual efforts by working together with a consistent, regional voice to protect these flying mammals throughout Latin America. RELCOM knows that humans and bats can live in harmony, and our primary mission is to ensure the survival of species and maintain healthy, viable bat populations of bats in Latin America and the Caribbean.

A prime strategy for meeting these goals is the identification and recognition of specific critical sites that are home to especially threatened species, as well as larger areas with high bat-
species diversity, including species that provide vital services to the ecosystems they inhabit.

RELCOM developed in 2011 a formal conservation mandate for the creation of these Areas (AICOMs) and Sites (SICOMs) of Importance for the Conservation of Bats (Areas or Sitios Importante para la Conservación de los Murciélagos). These will be the focus of much of RELCOM’s education, conservation and advocacy efforts in the future.

AICOMs include key areas in which bats spend most of their core activities of roosting and foraging. SICOMs are smaller, distinct sites such as caves, parks, bodies of water or even buildings, bridges, tunnels or abandoned mines. Both should include species that are important to national or regional conservation or contain especially rich species diversity, regardless of threat levels.

RELCOM encourages the principle that each country is free to establish as many Areas and Sites as are needed to ensure the conservation of its bats. Each of the local bat-conservation organizations of RELCOM is working on proposals, within the regional guidelines, for their own A&Ss.

We have so far officially recognized eight areas and sites in four countries, creating the foundation of a regional network that now supports the conservation of at least 24 bat species, including six considered threatened and 18 that are highly relevant to conservation.

We expect within a few years to have a fully functional network of AICOMs and SICOMs throughout Latin America and the Caribbean that will provide truly effective protection for most of the region’s threatened bat species.

Within these areas, an army of local volunteers and members of bat-conservation groups will be working on public outreach, communication, environmental education, research, management and the many other activities required to ensure the persistence of our essential allies.

This is just the beginning.

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RUBÉN M. BARQUEZ is founder of the Program for the Conservation of Bats of Argentina (PCMA) and serves on the Natural Sciences Faculty of the Universidad Nacional de Tucumán in Argentina.

### RELCOM’s Initial Areas and Sites of Importance for the Conservation of Bats

**Argentina**

**AICOM Parque Provincial Potrero de Yala** (Jujuy Province, northern Argentina): This protected area of lakes, hills, forests and grasslands is just 19 miles (30 kilometers) from the city of San Salvador de Jujuy. It hosts migratory species such as Mexican free-tailed bats (*Tadarida brasiliensis*), hoary bats (*Lasiurus cinereus*) and western red bats (*L. blossevillii*), as well as several data-deficient and near-threatened species, plus the vulnerable Ipanema bat (*Pygoderma bilabiatum*).

**SICOM Cueva de los Murciélagos** (Córdoba Province, north-central Argentina): The “Bat Cave,” actually an abandoned mine, is home to what is believed to be the largest bat colony in the southern cone of South America. Although no reliable estimate of bat numbers, primarily migratory Mexican free-tailed bats, is yet available, the site is now protected under provincial law.

**SICOM El Sauce** (Córdoba Province): Located in a mountainous region, El Sauce is a system of natural, structurally complex caves that provide roosting sites for small big-eared brown bats (*Histiotus montanus*) and *Myotis dinelli*. This SICOM’s primary importance is the opportunity to educate the public about bats.
**Bolivia**

AICOM Santuario Municipal Ecológico San Juan de Corralito (San Matías, eastern Bolivia): Two at-risk bat species—the endangered Tomes’ sword-nosed bat (*Lonchorhina aurita*) and the vulnerable *Natalus espiritosantensis*—inhabit two small caves in this mountainous landscape that was declared a protected area in 2011. These are the only known roosting sites for Tomes’ sword-nosed bats.

SICOM Gruta de San Pedro (Sorata, western Bolivia): This scenic cave is the main refuge of two ecologically important bat species: the black myotis (*Myotis nigricans*) and Geoffroy’s long-nosed bat (*Anoura geoffroyi*). It is also one of Bolivia’s very few permanent sanctuaries with bats that is open to the public.

**Venezuela**

AICOM Península de Macanao (part of the Isla de Margarita off Venezuela’s northern coast): The peninsula has a series of small caves, some known locally as “stones,” which are the main day roosts for two dry-climate bat species: Miller’s greater nectar bat (*Glossophaga longirostris*) and the Curaçaoan long-nosed bat (*Leptonycteris curasoae*), which is listed as vulnerable.

Bonaire

AICOM Parque Nacional Washington Slagbaai (Bonaire Island, Caribbean Sea off Venezuela): This national park includes a natural cave system that probably exceeds 150 caverns, with colonies of at least five bat species: Curaçaoan long-nosed bat, Peters’s ghost-faced bat (*Mormoops megalophylla*), Trinidian funnel-eared bat (*Natalus tumidirostris*), Curaçao myotis (*Myotis nesopolus*) and Miller’s greater nectar bat.

SICOM Kueba di Watapana: Of two known maternity roosts used by the Curaçaoan long-nosed bat and Peters’s ghost-faced bat, Lima Cave, known locally as Kueba di Watapana, has the largest number of pregnant and nursing *L. curasoae* females.
The first public-education program for bat conservation in Bangladesh faced a daunting task. Hardly anyone in the country knew actual facts about bats and most despised them as dirty, useless pests of farms and fruit orchards – even crops that benefit from bats’ pollination, seed dispersal and insect control. And on top of such myths and misinformation, fruit bats are identified as the animal host for the feared Nipah virus.

My colleagues and I at the new nonprofit Group for Conservation and Research on Bats (GCRB) were determined to begin changing those attitudes and build a sustainable education program in Bangladesh. With support from BCI’s Global Grassroots Conservation Fund, we introduced public-awareness programs in six areas, each within six miles (10 kilometers) of a known bat roost.

Bangladesh is home to at least 33 bat species. The largest and most commonly seen is the big Indian flying fox (*Pteropus giganteus*), a fruit-eating bat that roosts in tall trees. Our bats face an assortment of threats, including habitat loss due to deforestation and climate change, hunting for food and medicine and collisions with the fishnets that are often used to protect orchards, plus casual persecution and killing. Little is known about the biology of the bats of Bangladesh, and few support their conservation.

The magnitude of our challenge became clear as we surveyed 300 people (both urban and rural) in our study areas to determine their knowledge and attitudes about bats. We used the responses in crafting our education message.

Eighty-eight percent of our respondents said bats are blind, 67 percent consider them dirty animals that both eat and defecate with their mouths, and 56 percent said they are egg-laying birds. Worse, 89 percent believed bats are pests that have only a negative impact on crops, while 79 percent said bats play no role in the environment.

Surprisingly, only 29 percent of those surveyed saw bats as a potential source of disease, yet 55 percent knew that drinking palm sap only after it has been boiled can prevent Nipah-related encephalitis. The Nipah virus, currently limited to South Asia and perhaps Africa, can cause inflammation of the brain (encephalitis) and respiratory problems.

The World Health Organization reports that flying foxes are the primary animal host for the virus. Bangladesh accounts for...
most Nipah-related disease, with 188 cases (146 of them fatal) reported since 2001. Bangladesh and U.S. health officials attribute about half of those to human-to-human viral transmission. They blame the rest primarily on the rural custom of drinking raw date-palm sap, which can be contaminated by Indian flying foxes while it is being collected.

Health experts say the virus is readily destroyed – and the disease prevented – by boiling the sap before drinking it. The government has undertaken a mass-awareness campaign urging Bangladeshis to boil the palm sap. Our survey suggests this effort is having an impact, but the government has ignored bats’ ecological and economic benefits during this campaign. This makes our education program even more necessary and urgent. Our initial target districts include several that have faced Nipah outbreaks.

Using what we learned from our questionnaires, we developed outreach and educational materials in the native language of Bangla. These focused on the valuable role of bats, the threats they face in Bangladesh and what can we do, at little cost, to protect our bats. We printed and distributed brochures, species cards and posters. We also produced “rally caps,” paper hats with the message, “Save the Bat/Safe the World,” that proved very popular with schoolchildren.

Over the past year, we presented a three-hour education program at 15 high schools and primary schools, 10 of them in cities and 5 in the countryside. These programs began with a short presentation, including PowerPoint displays where electricity was available, that described key features and benefits of bats. Then the children were led through such fun activities as a drawing competition, a bat-facts quiz and “bat math,” a bit of arithmetic built around bats and insects. A final questionnaire showed a dramatic increase in knowledge and appreciation of bats.

We took our outreach efforts to a variety of villages, targeting especially farmers, orchard owners and hunters. We shared our brochures and our message about the value of bats and bat conservation. We worked to convince orchardists to use less-lethal alternatives to the fishing nets many use to protect their fruit from bats. Large numbers of flying foxes crash into these nets, becoming so entangled they can’t escape on their own. Left hanging helplessly in the nets, they starve to death. We desperately need to develop an inexpensive, but effective, alternative to these nets.

Given that hunting flying foxes is generally illegal, we had a hard time locating hunters to educate. We eventually reached 13 hunters, and they mostly accepted the importance of bats, although they would not agree to give up their profession. We will continue these efforts.

Among other projects during our initial year, we had information booths and education programs for visitors to the Chittagong Zoo and the popular Bangabandhu Sheikh Mujib Safari Park. For the first time, a bat-education stall was staffed at the Bangladesh Department of Livestock’s annual Agricultural Fair in Chittagong, as we described the need for bat conservation to a wide range of farmers and ranchers. We even won a second-place prize for our presentation. We also staged a Year of the Bat rally and seminar at the Chittagong Veterinary and Animal Sciences University (CVASU).

In one of our most promising successes of this past year, we conducted a capacity-building workshop for 20 select college students to enhance their interest in bat research and conservation. We trained these volunteers in very basic biology and in identifying bat roosting sites. After the training program, they conducted what we believe to be the first bat-population survey in Bangladesh. Population estimates and GPS location data were forwarded to our group.

These students identified a total of 71 roosts of Indian flying foxes. Most consist of small populations (fewer than 500 bats), but we also identified five sites that each host more than 1,500 flying foxes.

Historically, these bats roosted in much larger numbers in fig or “bot” trees. Following years of deforestation, however, they now have shifted mostly to smaller trees and vegetation, especially bamboo and koroi and eucalyptus trees, often in close proximity to towns and villages.

These young, enthusiastic volunteers can, with continuing support, form the heart of a new bat research and conservation community in Bangladesh.

During our first year of systematic bat education, we reached more than 2,000 people in our six study areas. Now we must find the funding to improve and expand this program into other districts so that we will, one day, be protecting bats throughout the country. Much remains to be done for the bats of Bangladesh, but at least the challenges seem less daunting now.

NURUL ISLAM, a student at the Veterinary Medicine in Chittagong Veterinary and Animal Sciences University of Bangladesh, has been working with the Group for Conservation and Research of Bats since 2009.

Acknowledgements

The author gratefully acknowledges the enthusiastic volunteers who made this project possible, as well as invaluable CVASU instructors Dr. Masuduzzaman, Dr. Ahasanul Haque, Dr. Mahmudul Hassan, Dr. Shahneaz Ali Khan and Dr. Amir Hossan.
Rodrigues flying fox: a tragic wonder

A critically endangered bat – the Rodrigues flying fox (*Pteropus rodricensis*), found only on a single island some 1,500 miles (2,400 kilometers) off the coast of southern Africa – is being highlighted as one of the Alliance for Zero Extinctions’ Seven Wonders of Endangered Species. These seven species were chosen by more than 100,000 worldwide votes cast on social media.

These seven selected animals are meant to call attention to a total of 587 critical sites, each identified by AZE as the single remaining home of one or more endangered species.

“Each of these phenomenal sites holds a unique wonder of nature – be it a charismatic bird, frog, turtle, or mammal – that is worth protecting in perpetuity, said AZE Chairman Mike Parr of the American Bird Conservancy. “While today we are announcing Seven Wonders, AZE sites are really 587 wonders around the world.”

The Alliance is a network of 88 prominent conservation groups (including Bat Conservation International) from 35 countries that is working to protect those unique AZE sites.

The Rodrigues flying fox is found only within a range of less than 50 square miles (130 square kilometers) on Rodrigues Island, part of the Republic of Mauritius in the Indian Ocean. Its dwindling bat population is threatened especially by loss of habitat to deforestation, which also increases the often-deadly impact of tropical cyclones on these fruit-eating bats. A promising captive-breeding program is under way with small populations at zoos around the world.

“The Rodrigues flying fox is beautifully adapted to the dry woodlands of its small Indian Ocean island,” said BCI Executive Director Andrew Walker. “Unfortunately, it’s not alone in its troubles: island bats around the world face similar, severe threats. “AZE’s Seven Wonders project is an important reminder of all that we lose when species go extinct,” he said.

The other six Wonders of Endangered Species are the long-whiskered owlet of Abra Patricia, Peru; the golden poison frog of Río Saija, Colombia; the Roti Island snake-necked turtle of Roti Island, Indonesia; the Siberian crane of Poyang Hu, China; the Lear’s macaw of Raso da Catarina, Brazil; and the Juan Fernández firecrown of Isla Robinson Crusoe, Chile.

Forest Service awards for BCI

The U.S. Forest Service is honoring four members of the Bat Conservation International Education Department who developed and helped present an exciting live webcast from BCI’s Bracken Bat Cave. The internet-based experience gave more than 40,000 people a lesson in bats and bat conservation, as well as a virtual ringside seat for the emergence of the world’s largest bat colony. To date, more than 200,000 others have viewed the online video.

BCI is a founding partner, with the Forest Service and the Prince William (Virginia) Network, of the BatsLIVE program that has now produced four webcasts, including the September 18, 2012, program from Bracken. The goal of distance-learning programs is to “raise the awareness, understanding and appreciation of bats and the unique karst and cave ecosystems that many bats rely on.”

Among those receiving Forest Service Wings Across the Americas/BatsLIVE Glass Awards for 2013 were BCI Education Director James Eggers, who conceived the program, planned the agenda and cohosted the program, and Bracken Cave Coordinator Fran Hutchins, who handled logistics and gave presentations on the Bracken colony.

Certificates were awarded to BCI Outreach Associate Dianne Odegard, who displayed live bats, and Habitat Protection Coordinator Jim Kennedy, who described cave and karst ecology and their use by bats.

The awards were presented March 27 in Arlington, Virginia, in conjunction with the 2013 North American Wildlife and Natural Resources Conference.

The U.S. Forest Service and its International Programs have been invaluable partners with BCI in an array of bat-conservation programs and projects for years. The Bracken webcast can be viewed at www.batslive.pwnet.org/webcast/webcast_page_sep18.php
Neighbors save Austin bats

by Dianne Odegard

Calls and emails started pouring into BCI last September (2012) from folks living near Lamar Plaza in Austin, Texas. The shopping center was about to be demolished to make way for new development and these concerned neighbors informed us that hundreds, maybe thousands of tenants at Lamar Plaza had no lease and no intention of leaving. They were bats.

Mexican free-tailed bats had been roosting behind signs and in crevices around the plaza for decades. The largest colony found a home behind a colorful plywood sign at Ray & Shane Hennig’s Heart of Texas Music store. The space between the building and the long, narrow sign provided about 50 square feet (5.5 square meters) of prime real estate for freetails.

Austin is famous for the urban bat colony that lives under its Congress Avenue Bridge, but countless other bats roost throughout the city. Most people rarely notice these urban bats, but the Lamar Plaza area included a lot of neighbors who had been watching bats emerge from behind that sign for years. Many who contacted us offered to help if BCI could think of a way to save the bats.

“I’d been keeping an eye on those bats for almost seven years,” said John Stewart, who lives nearby. “When I heard about the pending demolition, I knew we had to do something to save them and give them a chance to thrive somewhere else.”

About six weeks before demolition was to begin, Heart of Texas Music owners Ray and Mary Hennig gave us permission to have BCI volunteers take down the sign, which they planned to use at a future location. We wanted to ensure that the sign came down after dark, when most of the bats would be gone on their nightly insect hunt.

I soon received a call from Greystar Development & Construction, which was overseeing the work. Project manager Robert Holland said Greystar was definitely interested in helping the bats. He arranged for construction superintendent Raymond McKittrick to meet with me, BCI volunteer Lee Mackenzie (my husband) and John Stewart.

McKittrick said Greystar would pay for one or more bat houses, but there was no room to install a large, permanent artificial roost at the site. So we went with Plan B: neighborhood bat houses.

That’s when Stewart went into action. He created a flyer describing the situation and the need for backyard bat houses. He and his daughter Irene delivered the flyer to nearly 60 homes. And bat houses began springing up around the area.

Fortunately, this project coincided with the fall migration, when most Mexican free-tailed bats leave Central Texas to fly south for the winter. We set out to remove the sign on November 19, just one day before demolition began. With bat houses in place throughout the neighborhood, the rest was up to the bats.

With a pickup truck, a ladder and assorted tools, volunteer Wes Hall, Lee and I set to work. As the sign’s three panels came slowly down, hundreds of bats came flying out. Several startled bats landed in the bed of the pickup, and the work shut down briefly as we retrieved and examined the downed bats. All eventually flew safely off to rejoin their roost mates.

This was a remarkable and unexpected demonstration of the power of informal cooperation for conservation. Neighbors who might never have met became allies; a development company stepped up to protect animals from the unintended consequences of a project; and BCI staff and volunteers saw just how strongly many Austinites feel about their bats.

Thanks also to Jon Lees, Kenneth Finnegan and Patty Stewart for their help, and to Debbie Zent of Austin Batworks for her excellent bat houses.

Working together, we can make a great difference for bat conservation.

DIANNE ODEGARD, a bat rehabilitator, is Outreach Associate for Bat Conservation International.
Honors for Bracken volunteers

This year’s San Antonio Bat Fest celebrated the bats of Texas – and BCI also used the occasion to celebrate three incomparable volunteers with a combined 80-plus years of protecting and improving Bracken Bat Cave. They are (from left in the photo) Bob Cowell, Kurt Menking and Rick Corbel.

Bob has been protecting Bracken for more than 30 years, since well before BCI purchased the cave in 1992. He was there when the first trail was cleared in 1993. Kurt has also volunteered at the cave for three decades, helping with summer tours and work projects. His GIS-mapping skills have been invaluable for surveys of the preserve. Rick has worked tirelessly on a wide range of projects for more than 20 years and is often seen tinkering with assorted equipment to keep it running.

Fran Hutchins, BCI’s Bracken Bat Cave Coordinator, said, “BCI would have been hard-pressed to share this spectacular wonder of nature with its members without these guys, along with the thousands of volunteer hours that all of our volunteers put in each year.”

BCI Member Snapshot

Barbara Ayers manages a one-acre farm that’s used as a learning resource of schoolchildren in Pasadena, California. The school decided to enlist the aid of bats in controlling insects. “Plus,” Barbara says, “we think bats are cool!” So these first- and second-graders, with help from their teachers and a little advice from BCI, built this pair of nursery houses. Third- and fourth-graders opted for a rocket-style bat house. The youngsters had a great time building their bat houses, and now they’re hoping to attract some tenants.

Share a snapshot of your bat activities: email it to pub@batcon.org or mail to Snapshot, Bat Conservation International, PO Box 162603, Austin, TX 78716.

The Wish List

Your help with any of these special needs will directly improve BCI’s ability to protect bats and bat habitats. To contribute or for more information, contact BCI’s Department of Development at (512) 327-9721 or development@batcon.org.

Saving Bats from Wind Turbines

Scientists estimate that more than 1,000 U.S. wind facilities have caused the deaths of 650,000 to 1.3 million bats, and wind energy is expanding around the world. Bat Conservation International’s Bats & Wind Energy Program has been working since 2004 to minimize those deaths. Now we are conducting a landmark Bats & Wind Energy Workshop in Honolulu, Hawaii, June 18-20. Participants will be trained on the latest in research and monitoring techniques, and learn strategies for protecting bats from wind turbines. We hope to provide full scholarships so two members of RELCOM, the Latin American Network for Bat Conservation, can attend. We must develop partnerships and build capacity as wind energy expands in developing countries. Two scholarships total $6,500 for registration ($975 per person), airfare ($1,300 per person) and food and lodging ($975 per person).

Teaching Conservation in DR Congo

Bat research and conservation is barely beginning in the Democratic Republic of the Congo, but biologist Prince Kaleme of the federal Center for Research in Natural Sciences has an ambitious plan for a pilot project with great promise for the future. He plans to train 10 natural-science teachers who will conduct the first-ever bat-diversity surveys in the Itombwe Forest Reserve, an area rich in bats but subject to intense pressure from bushmeat hunters. The teachers will take their new knowledge back to classrooms, and their results will be used for posters and other materials as part of an intense educational effort (that also involves parents) at five pilot schools. Kaleme’s goal is a blueprint for bat conservation throughout the country. He requests a BCI Global Grassroots Conservation Fund grant of $4,000.

Bat Trunks for Volunteer Educators

BCI’s Bat Trunks, with a full suite of education materials, videos, activities and hands-on teaching aids, have been used for dozens of bat-conservation presentations since they were created in 2011 — thanks to generous Wish List donors. We have shipped the on-loan trunks (at BCI’s expense) to 32 organizations in 19 states for use at elementary schools, philanthropic groups, libraries, parks, day-care centers, nature centers and homeschool classes. These trunks reach and change hearts, minds and attitudes about bats. $1,000 would cover the costs for two-way shipping of the trunks to 20 to 25 volunteer educators.
Eastern Red Bat & Sulawesi Flying Fox!

Adopt-A-Bat!

www.batcon.org/adopt