SPECIAL REPORT

THE MYSTERIES OF EBOLA

Probing the connections among humans, bats and the Ebola virus in West Africa and beyond
RAKANG CAVE once housed one of Thailand’s largest bat colonies, but it was on the verge of annihilation because limestone quarrying was killing bats with falling rocks. BCI and local partners gained a government ban on blasting near the cave and generated publicity on the importance of the bats to the local economy. Nearby villagers who relied on guano sales from Rakang Cave for their primary income voluntarily provided around-the-clock surveillance of the cave to help keep the bats safe.

Like the devoted guardians of Rakang Cave, your monthly recurring membership provides ongoing protection for bats worldwide. As long as you’re a monthly recurring giver, your membership will stay current, and you’ll receive no renewal notices.

If you are not yet a recurring giver, please sign up and give at batcon.org/recurring.
**OFF THE BAT**
BCI Executive Director Andrew Walker on the “One Health” solution to conservation

**SPECIES SPOTLIGHT**
A look at the hammer-headed fruit bat and the vital role it plays in Africa’s ecosystem

**GENERATION NEXT**
A few questions for Erin Adams, a graduate student at Angelo State University in San Angelo, Texas

**DONOR REPORT**
Thanks to BCI’s many generous friends and members who gave this past quarter

**BAT KIDS**
Reviewing Brian Lies’ latest bat-themed children’s book, *Bats in the Band*

**ON THE WING**
Recalling a Filipino child’s contagious enthusiasm for bats

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**BAT SIGNALS**
BCI news and conservation updates

- Preventing kills at wind farms
- Bracken Cave 2014 successes revisited
- Remembering Marion Chester Read
- Help BCI fill out its wish list for 2015
- Pittsburgh zookeepers partner with BCI

**FIELD NOTES**
Research news from around the globe

- BCI partners with Disney to help save four endangered bat species
- Species count passes 1,330
- Supporting a rediscovered species
- New disk-winged bat discovered
- Advancing bat conservation and science in Latin America
- Reflections from the annual WNS workshop

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**SPECIAL REPORT**

**THE MYSTERIES OF EBOLA**
Probing the connections among humans, bats and the Ebola virus in West Africa and beyond

*by BCI Staff*
A ‘one health’ solution

by ANDREW WALKER

At one time in my life, I was an Army “wife.” My spouse, only the second female medical entomologist in the Army, was assigned to USAMRIID, the Army’s Medical Research Institute of Infectious Diseases at Walter Reed and Ft. Detrick, Maryland. Dengue, Korean Hemorrhagic Fever, Q Fever, Equine Encephalitis and Anthrax were common topics at dinner. As was Ebola.

At the time, Ebola had only recently been identified, but it was one of several emerging diseases to which USAMRIID scientists were paying close attention.

In the years since, much has been learned about Ebola and other “zoonotic” (originating in animals) diseases, though much remains unknown in the still-young field of epidemiology. Research suggests some species of bats are a reservoir for Ebola, SARS and other serious infectious diseases, but how these diseases jump to humans is still unknown, though eating bats, primates and other animals that may contract the disease or eating fruit contaminated by bat droppings are possible avenues of transmission.

BCI has worked hard over the past 30-plus years to reduce people’s fear and persecution of bats, but it’s possible that bats will be viewed differently after this crisis ends. The Ebola outbreak may lead to widespread efforts to kill or displace bat colonies in West Africa and beyond, without clear evidence that doing so will make people safer.

Such a response could, in fact, drive bats escaping efforts to cull them into closer contact with people as they seek out new roosts.

Bats are an essential ingredient in ecosystem health, and the link between human well-being and the environment is well documented. This concept is known as “One Health” (see page 13), and it argues that the best way to minimize outbreaks of zoonotic disease is to ensure bats and other wildlife have intact ecosystems in which to live.

Cutting down forests and hunting wildlife for bushmeat or the illegal wildlife trade exposes more people to zoonotic disease. If there are any silver linings to this terrible tragedy, they could include more effective medical treatments and more rapid development of a vaccine for Ebola and other zoonotic diseases (see “Can Bats Help?” on page 11); widespread education on the dangers of eating bushmeat; and the creation, and better protection, of parks and preserves.

It’s not difficult to imagine, conversely, that desperate governments and communities will feel compelled to eradicate bats on sight for years to come to help ensure such a tragedy never happens again. BCI will do what it can, working with international health agencies, governments and communities to help strike a One-Health balance that better protects people as well as wildlife.

Our hearts go out to the people of West Africa and everywhere this deadly disease manifests.

Andrew Walker
Executive Director
The demand for renewable energy is expanding rapidly across the globe and poses potentially serious consequences for many species of bats and birds. The better we understand these impacts, the more we can do to address them. BCI wind energy program director Cris Hein accordingly traveled to Chile and South Africa recently, advising scientists, wind industry representatives and government officials on creating effective programs to document and minimize bat fatalities at wind energy facilities. BCI hopes to foster greater collaboration among the industry, scientists and conservation organizations to build local capacity to monitor bats and ensure bats are considered when siting, building and operating turbines.

For background on the issue of bats and wind energy in North America, visit batcon.org/wind.
BCI in 2015 will phase out its Basic Membership and instead offer nine types of annual memberships, from $30 to $1,000.

Appreciation

The Original Bat Cave

Some 5,000 BCI supporters and members of the public, each hosted by BCI Preserve staff and our many volunteers, came to Bracken Cave this past year to watch the nightly emergence of the Preserve’s 15 million-plus bats. Among these visitors was Former First Lady Laura Bush, who made her first trip to the Cave in June, along with the board of Taking Care of Texas (TCT), a conservation organization she founded.

Other visitors to the site in 2014 include:
- State Representative Lyle Larson, one of Texas’ greatest advocates for conservation, who brought fellow legislators and their staffs and families to the Preserve in July;
- Trinity University Assistant Professor Jacob Tingle, who brought with him rising high school seniors from the University’s summer pre-college program;
- Texas State University undergrads, who with Professors Randy Simpson and Sandra West-Moody watched Bracken’s Mexican free tails; and
- A number of scouts, church groups and others, who camped overnight to watch the equally dramatic early morning return of the bats.

BCI’s extraordinary volunteers help make Bracken Cave accessible to the public and do a beautiful job of maintaining our trails and interpretive signage. Thank you for all your efforts and dedication, especially Don and Edith Bergquist and Coco Brennan.

Get Bracken

To watch a video of the Mexican free tail bats’ nightly emergence from Bracken Cave, and to read more about BCI’s conservation efforts of the Cave and the surrounding Texas Hill Country, visit batcon.org/bracken.

In Memoriam

Remembering BCI’s First Lady

On Oct. 21, 2014, Marion Chester Read, longtime friend of Bat Conservation International, passed away—and we choose to imagine she has resumed the adventurous journey she shared with her husband, Verne, who passed away in November of 2012.

Every conservation group needs friends like Verne and Marion Read, but few are fortunate enough to have such indispensable supporters. It is hard to imagine BCI’s 32 years of success without the Reads. “They listened when no one else heard,” says BCI’s Founder Merlin Tuttle.

For BCI and bats, Marion Read earned something of a “first lady” status.

She sent BCI its first donation, ever. When Verne served as Chairman of the Board for BCI, she was at his side, working to build our conservation organization on a global scale. Marion even joined the team that traveled to American Samoa on a mission to address the decline of flying foxes—an
Consider a tax-deductible gift to BCI and help us support bats

Y our help with any of these special needs will directly improve BCI’s ability to protect bats and their habitats.

» Creation of a BCI mobile and tablet app: BCI is always seeking new ways to promote bat conservation. A gift(s) totaling $14,600 will allow BCI to build an interactive educational app for iPhones and iPads. Virtually nothing on bats currently exists in this format.

» Conservation of Fiji’s endangered bats: The Critically Endangered Mirimiri, the national mammal of Fiji, and the Endangered Fijian free-tailed bat are two of Fiji’s three endangered bats, and their last known strongholds are highly threatened. The Mirimiri, known only from the Taveuni Forest Reserve on Taveuni Island—and possibly from remnant cloud forests on Vanua Levu Island, according to an unconfirmed report—is threatened by forest fragmentation. The only confirmed roost of the endangered Fijian free-tailed bat is in Nakanacagi Cave on Vanua Levu Island, which has experienced significant clearcutting of its forests. BCI and local conservation group NatureFiji-MareqetiViti are working to end both threats, and we have an urgent need for $15,000 to launch a dedicated effort with local communities, the government and private companies to protect the critical habitat for these species and plan for their recovery.

» Bat detectors for Venezuela: The Paraguana moustached bat is endemic to Venezuela’s tiny Paraguana Peninsula. Known from just four caves, this insect-eating bat is critically endangered. BCI and our Venezuelan partners are working to expand protection and improve conservation management of these caves and the bat’s most important foraging areas. Two gifts of $1,500 or one gift of $3,000 will allow BCI to provide its in-country partners with two Pettersson D240X ultrasound detectors to better map the bat’s critical habitats.

» Bat trunks for classrooms: BCI Bat Trunks travel to classrooms around the country—a much in-demand curriculum tool for teachers and librarians. Each trunk includes books, DVDs, activity instructions and other cool things like, “this is what bat fur feels like” swatches. Creating and replenishing these trunks is labor-intensive but well worth it. A gift of $5,500 will allow BCI to hire a college intern to respond to school and library requests for these unique teaching aids.

» Bat flyers for flying bats: The demand for education and outreach materials on bats continues to grow significantly, as does the need for such materials, as bats come under increasing pressure from habitat loss, wind power, White-Nose Syndrome and other threats. A gift of $2,100 will allow BCI to reprint three of its most-requested brochures for the next year.

From Wisconsin to Thailand, Central America to the South Pacific, Marion was a leader in bat conservation. The staff and board of BCI join Marion’s four children, twelve grandchildren and one great-grandchild in celebrating the passing of a great matriarch.
THERE ARE 1,331+ SPECIES OF BATS IN THE WORLD. THIS IS ONE OF THEM.

**hammer-headed fruit bat**

- **BINOMIAL**
  - Hypsignathus monstrosus
- **FAMILY**
  - Pteropodidae
- **COLONY SIZE**
  - 5 avg. up to 25
- **WINGSPAN**
  - up to 38 inches (97 cm)
- **DIET**
  - frugivorous
- **IUCN RED LIST STATUS**
  - Least Concern
- **REGIONS**
  - [Map showing regions]
The hammer-headed bat (*Hypsignathus monstrosus*), widely distributed in equatorial Africa, is one of three species of African fruit bat thought to be asymptptomatically infected with the Ebola virus; though scientists do not know if the species is an incidental host or a reservoir of *Ebolavirus*. The little-collared fruit bat (*Myonycteris torquata*) and the Egyptian fruit bat (*Rousettus aegyptiacus*) are the other two species. The species is locally common and is typically found in lowland tropical moist forests, riverine forests, swamp forests, mangroves and palm forests, where it roosts in trees. Although colonies up to 25 bats have been observed, the average hammer-headed fruit bat roost is fewer than five bats.

The hammer-headed bat, with wingspans up to 38 inches (97 cm), is Africa's largest bat. Strong sexual dimorphism is observed in the species, as males are significantly larger than females. Males have a large head with enlarged rostrum, larynx and lips that allows for the production of loud honking calls; the appearance of females is similar to most other fruit bats. The species has a "lek" mating system whereby a few hundred males gather into groups (leks) to attract female mates.

Although hammer-headed bats are frugivorous, they are generally not considered to be effective seed distributors as they tend to consume their food in the same area where they find it. Figs are often a major component of their diet, and they also are known to forage on bananas, guavas, mangos and other cultivated crops. The hammer-headed bat is considered a crop pest due to its diet of fruit.

The IUCN Red List of Threatened Species lists the hammer-headed bat as "Least Concern" due to the species' widespread distribution and presumed limited threats to its habitat. However, in some parts of its range, hammer-headed fruit bats are threatened by deforestation, particularly the loss of riverine forests, and it is hunted as bushmeat. As it is found in Tai National Park (Côte d'Ivoire), and with its range throughout equatorial Africa, it is likely found in other protected areas and is thought to be relatively secure.
the mysteries of ebola

Probing the connections among humans, bats and the Ebola virus in West Africa and beyond

by BCI STAFF
The outbreak of Ebola in West Africa has been devastating. While Senegal and Nigeria have contained their outbreaks, the situation remains grim in Guinea, Liberia and Sierra Leone—though the rate of infection has begun dropping in Liberia. As of early December, at least 15,000 individuals had contracted the disease and more than 5,000 had died. Mali is the latest African country to report cases. All previous known outbreaks were in Central Africa; this is the first documented outbreak in West Africa. Because several species of fruit bats in Central Africa and Asia have been found to possess antibodies to the disease, scientists believe bats are a natural reservoir for the virus, which apes, forest antelopes, porcupines and humans can catch from eating fruit or other foods contaminated by bat saliva or droppings, or by touching their mouths or eyes after touching a surface contaminated by droppings or saliva. Our hearts go out to the victims of this terrible tragedy.
In the end, we may never know how it began.

It was in March when the mysterious illness affecting a small region of Guinea was identified as Ebola. Although West Africa has a native strain of the virus, the strain from which people in Guinea were dying appears to be a variant of Zaire ebolavirus, known previously only from outbreaks in Central Africa, more than 2,000 miles to the east.

The current outbreak, by far the largest since the disease was first identified in 1976 in Central Africa near the Ebola River, seems to have started in the village of Meliandou in Guéckédou Prefecture, Guinea, with the death of a 2-year-old boy in December 2013. His mother, sister and grandmother also became fatally ill. People infected by those victims and a local health care worker—Ebola spreads by physical contact with bodily fluids—then carried the disease to other villages. Health care workers responding early to the crisis were particularly hard hit, with 419 contracting Ebola and 233 dying before protective clothing, strong disinfectants and improved procedures for working with infected individuals were widely available.

Since then, Ebola has spread to five other African countries, and infected health care and aid workers returning to Europe and the United States have spread Ebola to several European and American nurses who have treated these individuals. In Guinea, Liberia and Sierra Leone, the disease continued to spread rapidly due in part to the common West African practice of touching and washing the body of the deceased.

Doctors Without Borders, which was already working in Guinea on other diseases, speculated the young Guinean child—"Patient Zero" in the parlance of epidemiology—had gotten the disease directly from local fruit bats, noting that bats are routinely hunted in the area as "bushmeat."

This did not explain, however, if and how Zaire ebolavirus jumped 2,000 miles from Central Africa. New questions arose while old ones lingered: Had an infected fruit bat from Central Africa flown that distance and been caught and eaten? Had its droppings or saliva contaminated a piece of fruit eaten by a person, pig, porcupine, forest antelope or primate?

Did Zaire ebolavirus travel to West Africa in another way, possibly via Guinea's underground trade in primates and bushmeat?

And regardless of how Ebola made this journey, when exactly did it arrive?

In April The New England Journal of Medicine reported the Ebola striking West Africa may represent a previously undiscovered strain that may have been circulating in West Africa for some time. This theory received support in a September article in Science: Researchers studying genetic variation over time of Zaire ebolavirus believe this variant may have found its way from Central Africa to Guinea as early as 2004. How it did so remains unknown. Extensive field research and testing of West African fruit bats and other animals routinely consumed as bushmeat may be needed before the likeliest routes of transmission are known.

The origins of four previous outbreaks of Ebola, all in Central Africa, are equally obscure. The truth is, the study of zoonotic disease—maladies that can jump from wild animals to humans—remains a young science. Predicting Ebola outbreaks remains elusive, although scientists are working towards this goal. Dr. Kevin Olival, a disease ecologist with EcoHealth Alliance, says a concerted, multidisciplinary effort is needed to better characterize the diversity and distribution of Ebola viruses in wildlife. "Then we must overlay this with risky human behaviors, like bushmeat hunting, that are likely to lead to viral spillover," he notes.

When the epidemic is finally contained, the world will be a different place. The world’s leading health care systems and international health agencies have had their
Can Bats Help?

Beyond their more well-known research associations with sonar and radar technology, bats have been the subject of many scientific studies over the years. At the Centre for Irish Bat Research, the genetic code of bats, some species of which can live for more than 40 years, is being used to study aging in humans. The anti-coagulating agent in the saliva of vampire bats has been used to create medicines that aid the recovery of stroke victims.

Now, some researchers are hoping bats can help us learn more about Ebola.

In addition to being a suspected reservoir for Ebola, bats are believed to be natural hosts for the viruses that cause Marburg, Nipah, SARS and MERS. As far as scientists are aware—and more research is needed—the immune systems of some species of bats may be providing some level of protection to bats against these viruses.

Answering questions about the immune system of tropical fruit bats might contribute to the development of control measures against the spread of diseases like Ebola, says Professor Janusz Paweska, head of the Special Pathogens Unit at the Centre for Emerging and Zoonotic Diseases at the National Institute for Communicable Diseases in Johannesburg, South Africa.

Ten researchers, including Paweska, identified Ebola antibodies in three fruit bat species in 2005. In 2011, he was part of a research team that visited Luebo in the Democratic Republic of Congo (DRC) to study one of the identified species, the hammer-headed bat (find out more about this species on page 6). In 2007 and 2008, the Luebo region was hit by two outbreaks of Ebola.

Understanding how deadly viruses like Ebola and the similarly fatal Marburg virus circulate in reservoir hosts is one of "the most hunted treasures in modern biology," Paweska says. "If we could understand the bat immune system and how it counteracts the replication or the growth of these very dangerous viruses, we might take some lessons from there and apply them to the development of antivirals or vaccines," he adds.
no live Ebola virus has been found in any bats.

But given this background and because apes and other primates consume large quantities of fruit, they also are at risk of contracting Ebola, as are some ungulates. Hunting and consuming primates and bats as bushmeat is another risky behavior West African governments have sought to curb early in the current epidemic.

Still, the fact remains: When Ebola will appear, and the exact reasons why, cannot yet be predicted. Far more remains unknown than known.

Separating Fact from Fiction

In times of crisis, however, it’s human nature to want answers, and the scientific uncertainties underlying this devastating epidemic make it more difficult to dispel widespread fear and anger in the affected countries. Because only 50 percent of people survive and return home from hospitals, many infected individuals have shunned treatment centers, leading to greater spread of the disease. Those who think health care workers bring the disease with them have even driven doctors and nurses out of villages. It also has been difficult in some rural areas even to track the disease, due to the belief that saying the word, “Ebola” would bring it on. An early but widespread rumor that Ebola was a medical hoax further hampered public cooperation. Conversely, those seeking medical treatment have often been turned away, given the very small number of hospital beds in these countries. Sierra Leone took the dramatic step in October of admitting as much and began providing families with protective clothes and gloves to take care of family members at home.
A Nigerian man fights Ebola symptoms by drinking 4.5 liters of Oral Rehydration Solution (ORS) per day. The solution is a mixture of salt, sugar and water.

Given the terrible impact of this tragedy, it may seem callous in the extreme to ask, “What does this outbreak mean for bats?” But the health of bats and humans in the tropics are inextricably linked. Bats control insects, pollinate crops and help maintain the health and diversity of tropical forests in Africa, as elsewhere. As those forests disappear and humans increasingly encroach on the last remaining habitats for bats and all other wild animals—and in some cases eat these animals—the potential for zoonotic disease to jump to humans increases substantially.

Given what we currently know about Ebola, the indiscriminate, widespread killing of bats would probably do little to make people safer, and perhaps would have the opposite effect if displaced bats are driven to seek out new roosts. But given the scale of the current crisis and its heavy toll on human life and well-being, a determined and coordinated effort to exterminate bats throughout West Africa may occur. Nigeria, which limited its outbreak to 19 people infected by a man who flew there from Liberia, has begunexterminating bats near government buildings.

As the crisis recedes, BCI and its public health partners will advocate for African governments to embrace a “One Health” approach (see related sidebar below) to minimizing the chances for future outbreaks. We also may help fund research to answer some of the key questions surrounding bats and their possible role in the current epidemic, as well as explore whether better understanding the immune system of tropical fruit bats could lead to better control measures in the future (read “Can Bats Help?” on page 11 for more on this topic).

In the more immediate future, banning consumption and sale of bushmeat, cracking down on the illegal wildlife trade, and reducing human encroachment into parks and preserves and other important natural areas would all be important steps forward. But in some of Africa’s poorest countries, these could prove tall tasks.

A ONE HEALTH APPROACH

As societies delve ever deeper into once-remote ecosystems, the risk that societies will encounter zoonotic diseases able to jump from animals to people increases. In these situations, the goals of public health and conservation coincide. To keep people healthy, ecosystems must be healthy, too. This concept is known as “One Health,” and has been defined as “the collaborative effort of multiple disciplines … to attain optimal health for people, animals and the environment.”

Hippocrates was the first person to argue that human, animal and environmental health are interdependent. Revival of his idea led to greatly improved public hygiene in the Renaissance and thereafter. The term “One Health” itself became widely used after a 2003 Washington Post story about an earlier Ebola outbreak in which doctor of veterinary medicine William Karesh was quoted as saying, “Human or livestock or wildlife health can’t be discussed in isolation anymore. There is just one health.” The following year, Karesh and colleagues Robert Cook and Steve Osofsky launched a series of conferences around the world with the theme of “One World—One Health.”

Of the 1,415 microbes known to affect humans, 61 percent come from animals. These include long-known diseases like plague, measles, mumps, pertussis and typhus, as well as more recently discovered diseases like Ebola, Nipah, West Nile and SARS.

Urbanization, international travel, climate change, deforestation and the illegal wildlife trade have increased the need for a diverse and highly integrated public health strategy. Epidemiologists, virologists and public health specialists are working with ecologists and other field biologists to study the life cycle of zoonotic diseases, track outbreaks and create healthier living environments for humans and wildlife alike.

Recognizing the threat posed to bats by outright persecution and habitat loss, BCI last year signed a Memorandum of Understanding with EcoHealth Alliance (ecohealthalliance.org) to cooperate on the protection of bats and continued study of their role in the ecology of zoonotic (animal-originating) disease. Like BCI, EcoHealth Alliance is dedicated to the conservation of biodiversity, especially in human-dominated biocapes where ecological health is most at risk because of habitat loss, species imbalance, pollution and other environmental issues caused by human-induced change.

As the Ebola epidemic is brought under control, BCI will work with EcoHealth Alliance and other agencies and governments to determine the most effective ways to minimize human–bat interactions and break the chain of disease transmission while ensuring the lasting integrity of bats and their habitats.

For more information on the One Health concept, visit the Centers for Disease Control and Prevention at cdc.gov/onehealth.
finding her calling

Bats discusses grad student Erin Adams’ passion for bats and ‘bat people’

Erin Adams is a second-year graduate student pursuing a Master of Science degree at Angelo State University in San Angelo, Texas. She is researching the activity patterns and early-season diet of the endangered Mexican long-nosed bat (*Leptonycteris nivalis*) in Texas.

**Bats:** How did you become interested in bats?

**Adams:** Everyone has an experience that shapes his or her view of bats. In my case, it started with the story my grandfather shared about when he and my father, as a child, found a bat that had died in the house. The empathy he shared for the bat shaped my view of bats. In addition to growing up in a supportive family that was connected to nature, that set the stage for me to pursue a career working with bats years later.

**Bats:** What advice do you have for the next generation of students undertaking bat research?

**Adams:** Simply put, do what you need to do to get involved and to be successful. Obtain experience with diverse research techniques, even with other taxa. Read papers, ask questions and let the answers guide you to your next question. Volunteer to get experience. Talk to people and build a network of peers and colleagues. Keep moving forward, and you will position yourself to be in the right place at the right time for your opportunity.

**Bats:** What are your hopes for the long-term outcomes of your research?

**Adams:** Ultimately, I hope my research is able to fill in important knowledge gaps for the conservation and management of Mexican long-nosed bats across their range. I want the methods I develop to overcome some of the specific challenges for deploying PIT tag readers at caves in remote field locations, and to serve as a model for others undertaking similar research. I want to apply the skills I have learned in my research to contribute to a larger conservation agenda.

**Bats:** What is the most amazing thing you have learned about bats?

**Adams:** Given the diversity of bats in the world, I am fascinated by the specialized traits of different species: social systems in colonies, links between echolocation frequencies and insect prey size, as well as niche partitioning, amazing migrations, and hibernation as a whole! But perhaps the most amazing thing I’ve learned from working with bats is how incredible bat people are, and I have found them to be encouraging and willing to help students like myself.

**Bats:** Any closing thoughts?

**Adams:** I believe we need to always examine our assumptions about bats; they are more dynamic and resilient than we know. There is importance and hope in bat research and conservation; we can and will make a difference through our work. While the challenges are great, and progress often slow, the commitment and creativity of people in the global bat community can make a lasting and positive conservation impact as long as we keep learning and sharing our findings.
Taking action to save four endangered bats

With new grants from the Disney Worldwide Conservation Fund, BCI is launching or expanding projects on three continents to conserve four of the world’s most endangered bats.

In Latin America, the Mexican long-nosed bat (Leptonycteris nivalis) is an elusive pollinator with only one known breeding site, in the central Mexican state of Morales, which BCI will work with local partners to protect.

Further south, BCI is partnering with Dr. Jafet Nassar and the Program for Bat Conservation in Venezuela to expand protection for the Paraguaná moustached bat (Pteronotus paraguanensis). Isolated to the tiny Paraguaná Peninsula in northwest Venezuela, this important insect-eating species faces serious threats at all of its known cave roosts. The currently protected area, Santuario de Fauna Cuevas de Paraguaná, was established by the government in 2008, but it lacks sufficient on-the-ground protection. BCI and our partners will secure the caves from further human disturbance and work with the government to expand the official preserve to include the bats’ most important nightly foraging areas.

In the Pacific, a Disney grant will allow BCI to expand its “Filipinos for Flying Foxes” program to establish new roost sanctuaries for the endangered golden-crowned flying fox (Acerodon jubatus), the planet’s largest bat by weight (up to 2.6 pounds).

Disney will also help fund work in Africa on the Maclaud’s horseshoe bat (Rhinolophus maclaudi), which was unseen for forty years and feared extinct until its rediscovery in Guinea in 2007. This project is on hold, however, due to the Ebola crisis.
With at least 219 species, Indonesia’s diverse archipelago of 13,000-plus islands has more bat species than any other country.

Second chances in the conservation of imperiled species are as rare as the species themselves, but biologists at the University of Queensland in Australia have rediscovered the New Guinea big-eared bat (Pharotis imogene), which had not been seen for 120 years.

A single New Guinea big-eared bat was collected by University of Queensland students Catherine Hughes and Julie Broken-Bow in July 2012, about 120 km east of Kamali, Papua New Guinea, not far from where it had last been collected in 1890. This region is close to mining and forestry projects that could prove a threat to its habitat. Research into the biology and ecology of the species to confirm its range and population status are high priorities, and BCI will be reaching out to scientists and conservation organizations working in the area to help build an effective partnership and strategy to ensure the New Guinea big-eared bat is not lost again, this time for good.

Researchers around the world continue to identify new species of bats. Fifteen species new to science have been described so far this year alone, bringing the total number of recognized bats species to 1,331. The 15 new species reported so far in 2014 come from 11 countries: Panama, Guyana, Venezuela, Ecuador, Peru, Bolivia, Morocco, Cameroon, Kenya, Ethiopia and Australia.

“New bat species are sometimes captured in the field, but others are discovered in museum drawers or laboratories when careful analyses show that samples identified as one species actually represent two or more distinct species,” says Nancy B. Simmons, Curator-in-Charge, Department of Mammalogy, at the American Museum of Natural History in New York.
**LATIN AMERICA**

**supporting ‘los murciélagos’**

BCI was a principal underwriter of the 1st Latin American Bat Congress, sponsored by the Latin American Bat Conservation Network (RELCOM), held Aug. 6–9 in Quito, Ecuador. Two hundred bat experts from 20-plus Latin American countries presented their latest research. BCI is working with some of these scientists on conservation of priority species, identifying significant bat habitats requiring protection in the process. BCI is also identifying and negotiating access to existing bat data to better inform our conservation planning and

**NEWLY DISCOVERED SPECIES**

**new disk release**

**Discovery suggests greater species diversity in region**

Thyroptera wynneae is a new species of the so-called "Disk-winged bat" described from Peru in 2014 by an international team lead by Paul Velazco of the American Museum of Natural History. Disk-winged bats have adhesive disks on their thumbs and feet that they use to adhere to the smooth surfaces of leaves on which they roost. Never before seen by scientists, the first specimens of Thyroptera wynneae were captured in 2012. Interestingly, this new species was discovered in an area already known to be home to two other species of Disk-winged bats, suggesting that local diversity of these tiny, specialized insectivores may be higher than previously suspected.

“Sometimes these groups have scientific names associated with them from past centuries, in which case old names can be resurrected for the newly identified species,” she adds. “Over the last couple of decades, about two-thirds of the ‘new’ species of bats have fallen into this category. The division of what was once thought to be one species into multiple species is more than just taxonomic bookkeeping; these changes often have important conservation implications. Newly recognized bat species frequently have small geographic ranges and thus may be at greater risk due to habitat loss or other local threats.” -- Katie Gillies, BCI Director of Imperiled Species
Nearly 80% of all BCI donations go directly to the conservation and education programs of BCI and our partners.

THANK YOU TO:

**Individual & Family Donors**

We offer our deepest gratitude to these individuals and families for their generous support of BCI as we work around the globe to protect bats and their habitats.

We are honored to recognize several groups of donors: those who contributed $250 or more from May 1 to October 31, 2015, our Monthly Recurring Members and new Legacy Circle Members. Thank you all for your leadership and encouragement.

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bats in the band

Author Brian Lies and his cast of bats strike a chord with readers

Reviewed by DIANNE ODEGARD,
BCI Education and Public Outreach Manager

B
rian Lies has done it again. He has sent his adorable bats to the beach, to the library and to a ball game—and gathered more fans (adults and children) on every excursion.

Where else can they go? Wherever they want to, so why not Priscilla Beach Theatre in Manomet, Massachusetts, for some tunes, courtesy of the bats themselves? That’s the setting and story of Lies’ latest book, Bats In the Band.

Mr. Lies’ previous books have won a number of awards and been recognized as New York Times Bestsellers, and it’s easy to see why. He is a gifted painter, and his illustrations are loaded with details that make it fun for kids and grown-ups to find new visual treats on subsequent viewings. For instance, I was completely charmed by his use of music posters, reminiscent of classic ‘70s rock bills, with re-imagined band names, like Beastie Bats and Bat Company. Lies also includes a few fun puns—“It ain’t over till the bat lady sings”—while making it all rhyme.

The author does a real service to his subjects, making the bats completely relatable to the children reading his stories. From the one little bat who has apparently refused to remove his water wings from his “Bats at the Beach” days to the many affectionate mother bats, Lies’ bat characters are both among us and separate from us—but somehow also just like us.

It’s a lovely introduction to bats for very young children and may go a long way toward shaping their attitudes (or, to stick with the book’s theme, toward changing their tune) about bats before being exposed, as they grow older, to the often-negative myths that still surround bats.

Mr. Lies clearly loves bats and is a supporter of bat conservation (full disclosure: He donates a portion of his books’ proceeds to Bat Conservation International). And though I wish his bats were a little less rodent-like, their faces are adorable, and he does a beautiful job on their wings, making them even more magical than in real life. After all, these bat wings are holding and playing musical instruments!

Bottom line: This review, BCI and Bats wholeheartedly recommend Bats in the Band.

Dear Bat Conservation International,

Each year my students have a “Batty Banquet.” After researching bats for six weeks, the children write their own non-fiction book about bats. The books include a table of contents that lists the following topics: Body of the Bat, Types of Bats, Echolocation, Habitats, Food and Enemies.

We celebrate our knowledge and books by inviting the parents to a Batty Banquet. Each child presents different topics about bats, such as: Cool Facts About Bats, Why We Need to Care, Are Bats Endangered?, White-Nosed Syndrome, Myths About Bats, and True or False Questions. The students create their own bat raps and recite poetry they have written. They then read their non-fiction books to their parents, and we celebrate with a banquet! We have all sorts of foods bats like to eat!

The parents are amazed about how much their children have learned about bats but most importantly how much the parents learned from the children. Most people do not understand the value that bats bring to our world and why we need to care about them.

Kindly,
Eileen Walters-Karas
Double Eagle Elementary
Albuquerque, N.M.
This is one of my most memorable moments at BCI. We had arranged for cavers from the Davao Speleological and Conservation Society and bat biologists to join our efforts on Samal Island, Philippines to locate caves with significant colonies of bats. We spread out over the island in small teams to talk with communities and farmers to track down cave leads and, if possible, to conduct a rapid assessment of the cave. After a long ride with three of us on a small motorcycle, we located a farmer who had a bat cave on his property. I listened closely and intently watched as Rai Gomez, my colleague, a bat biologist, and our guide and interpreter, gathered information from the farmer on the bats found in the cave. It was quite interesting to watch the very animated discussion, especially as this very young lady followed her father around and around trying to see the photos of the bats we were using in our discussions. She was very persistent and finally succeeded in getting her father to stop long enough for her to share and appreciate the bats!
There are many ways to give ... and help bats.

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