

bats

BAT CONSERVATION INTERNATIONAL

ISSUE 2 • 2026
BATCON.ORG

PROTECTING THE BATS OF KENYA'S COASTAL CAVES

*Projects safeguard caves while
providing community benefits*

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**BAT CONSERVATION
INTERNATIONAL**

Your will, your impact, your legacy for bats. Protect what matters most.

Every day at BCI, you help safeguard bats and the ecosystems we all depend on. From protecting critical roosts like Bracken Cave to advancing solutions to threats like white-nose syndrome, your support makes this work possible.

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This August, in honor of Make-A-Will Month, we invite you to take a simple step to care for your loved ones and the causes you care about using FreeWill's free online tool. With it, you can:

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2. Protect the people and priorities that matter most to you.
3. Leave a legacy gift to protect bats and the habitats they depend on.



Scan the QR code or visit
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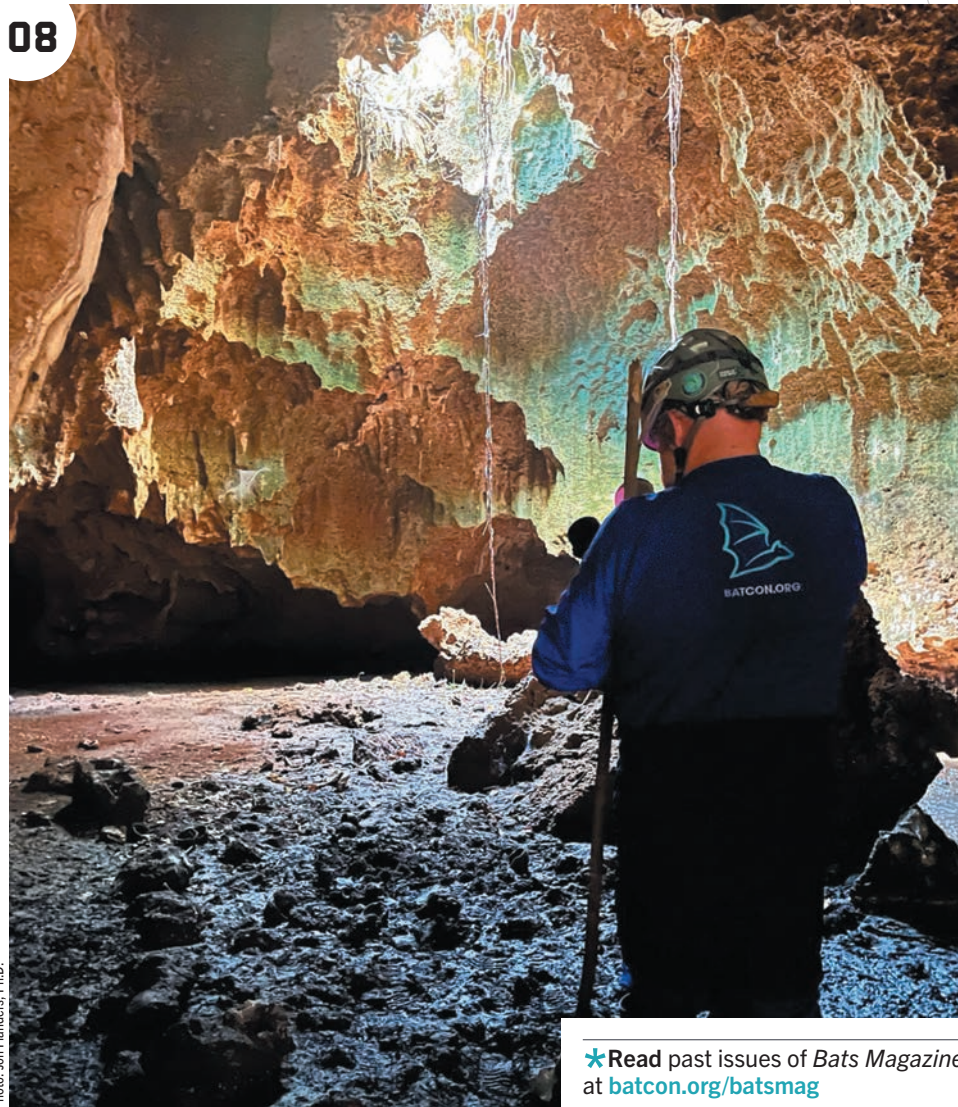


Photo: Jon Flanders, Ph.D.

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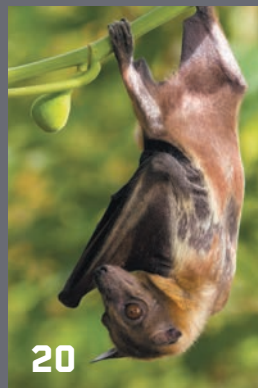
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ON THE COVER: This horseshoe bat shares coastal Kenyan habitat with Hildegard's tomb bat (*Taphozous hildegardeae*), and it is one of many species benefitting from BCI's conservation work in the country.

Image: Horizonline Pictures

Photo: Steve Gettle Minden Pictures

off the bat

A few words of introduction from your friends at Bat Conservation International



Bat Conservation International (BCI) is a 501(c)(3) organization dedicated to protecting bats and their essential habitats around the world. A copy of our current financial statement and registration filed by the organization may be obtained by contacting our office in Austin, Texas, address below, or by visiting batcon.org.

Main Office

500 N Capital of TX Hwy, Bldg 8, Suite 225
Austin, TX 78746, USA
512-327-9721

Managing Editor

Kristen Pope

Editor-in-Chief

Kathryn Slater

Contributors

Michelle Donahue / Proofreader

Publication Management

 BackPocket Agency

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Furthering Our Mission to End Bat Extinctions Worldwide



Mexican free-tailed bat.

Photo: Bruce D. Taubert

the life of BCI with the development of a bold and visionary strategic path to 2030. The plan, now in its final stages, will surely be a beacon of hope for bat conservation throughout the world.

Just as exciting, we are in the final stages of a global search for a new

Executive Director for BCI, a monumental effort. This candidate list was impressive and we anticipate naming our new leader soon.

And so, as reflected in this issue of *Bats*, we are entering a new era of both significant challenges and new hope for bats. Challenges to bats throughout the world are highlighted on these pages by reports from Kenya, India, and the United States, and hope is exemplified by our "Bat Chat" with a Bracken Cave volunteer. Additionally, this spring, we launched our Bat Ambassador Volunteer Training, and an amazing 2,000 people signed up on the first day.

We simply could not accomplish our goals without volunteers, inspiring young people like our Student Scholars, and supporters across the world who make our important work possible and with whom we will surely accomplish our mission to end bat extinctions worldwide.

Andy Sansom
BCI Board Chair

This issue of *Bats* comes off the press at a bittersweet time for Bat Conservation International (BCI). This Spring, we lost one of America's leading champions of bat conservation, J. David Bamberger, who passed away at the age of 97 on his beloved Selah Ranch in the Hill Country of Texas. He was Founder and Chairman of Church's Fried Chicken, served for many years on the BCI

Board, and was instrumental in the acquisition and stewardship of Bracken Bat Cave, the largest concentration of wild mammals on Earth. Like so

many of us, he dedicated himself to the protection of these amazing creatures and, remarkably, created on Selah the world's first human-made bat cave. Initially called "Bamberger's Folly" by the press, it is now home to more than 1.5 million Mexican free-tailed bats (*Tadarida brasiliensis*) and is known by the name he coined for it, "The Chiroptorium."

As we celebrate the Bamberger legacy, we commence a transformational era in

We are entering a new era of both significant challenges and new hope for bats.



bat signals

BCI updates and conservation news

State of India's Bats

Durga Das's leaf-nosed bat (*Hipposideros durgadas*) is one of the species included in the first State of India's Bats report.

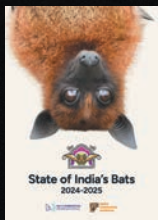
New report highlights conservation opportunities and challenges

This spring, BCI and partners released the first State of India's Bats report. It focuses on identifying what researchers know about India's 135 bat species, along with opportunities to advance the scientifically guided conservation of India's bats over the next decade.

The report highlights wins, including 12 new species being described over the past 20 years and increased protections for certain bat species, while also identifying threats to species survival, such as deforestation, urban development, unsustainable agricultural expansion, mining, and quarrying.

It also includes a list of priority activities the authors recommend to promote species protection across the nation, such as creating echolocation call libraries, curating molecular resources to help with taxonomic studies, establishing comprehensive networks of partners, and prioritizing bats in biodiversity action plans.

To share findings with stakeholders following the spring release, BCI and partners held publicity events in Shillong, Meghalaya, in northeast India, as well as in Delhi.



★ Read the report: batcon.org/soi

Share Your Space with Bats

Revamped web pages provide tips and tricks

Learn how to make your backyard a bat paradise by exploring BCI's content on bat gardens and bat houses.

Check out these pages for tips on fine-tuning your garden for bats, like planting native vegetation, adding roosting habitat, and incorporating vegetation that draws in a variety of insects to create a bat smorgasbord. The Bat Gardens page also features bat-enticing plant lists for a number of regions, including parts of California, Colorado, Kentucky, Oregon, and Texas.

It can be a challenge to get bat houses right, so BCI recently updated the Bat Houses page to include detailed information on construction, placement, and maintenance, as well as tips on safety principles to protect bats from dangers like overheating, predators, and other hazards. The page also explores bat houses around the world, from Australia to China to Ghana.

★ Check out the newly revamped sections of BCI's website at batcon.org/gardening and batcon.org/bathouse



Photo: Erin Cord

Reducing Bat Fatalities at Wind Energy Facilities

BCI scientists publish paper highlighting decision framework to reduce fatalities

Globally, millions of bats are killed by wind turbines each year. BCI and partners are working to make this form of green energy more sustainable by decreasing its impact on biodiversity.

A team led by BCI's Chief Scientist Winifred Frick, Ph.D., recently published a paper in the journal *Ecological Solutions and Evidence* that presented a decision framework to reduce bat fatalities at wind facilities. A key outcome of this research is the ability to calculate how many bats can be killed without threatening the

population at each wind project, even when there is uncertainty about local bat populations. This framework can be used to plan for bat-compatible turbine operations and set regulatory guidelines.



★ Read the study: besjournals.onlinelibrary.wiley.com/doi/10.1002/2688-8319.70189

Bats of the World: A Guide to Every Family

BCI scientists release new book

BCI's Chief Scientist Winifred Frick, Ph.D., and Director of Conservation Evidence Teague

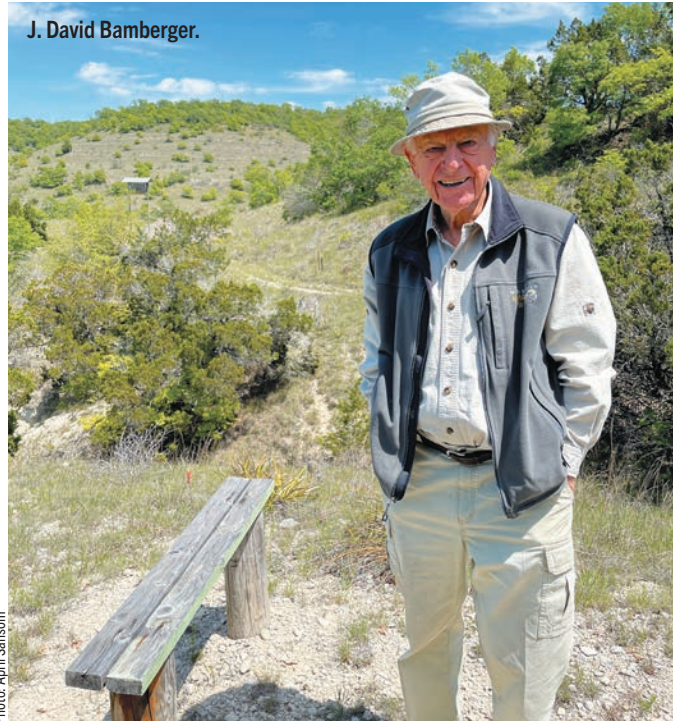
O'Mara, Ph.D., have teamed up to create an illustrated guide to bats. *Bats of the World: A Guide to Every Family* describes all 21 recognized families of bats around the world and features profiles of selected species, from carnivores to nectar feeders, as well as the conservation threats each species faces. The guide, published by Princeton University Press, includes photos, infographics, and more for species ranging from the tiny, 2-gram bumblebee bat (*Craseonycteris thonglongyai*) to the giant 2-pound golden-crowned flying fox (*Acerodon jubatus*).



★ Learn more at press.princeton.edu/books/hardcover/9780691265216/bats-of-the-world

Remembering a Conservation Legend

In memory of J. David Bamberger



In January 2026, conservation legend J. David Bamberger passed away at the age of 97. Bamberger served on BCI's Board of Directors and was instrumental in securing the original five acres for Bracken Cave. He worked with the family that previously owned Bracken Cave to arrange for BCI to purchase it and paid to build trails and infrastructure to make the property accessible to visitors.

Bamberger worked his way up from being a door-to-door vacuum cleaner salesman to a founder and CEO of Church's Fried Chicken. As the company's largest shareholder, he invested his earnings in conservation projects. Inspired by Louis Bromfield's book *Pleasant Valley*, Bamberger sought out parcels of land that were in need of restoration. In 1969, he purchased 3,000 acres in Blanco County, Texas, and eventually expanded the property to encompass 5,500 acres, naming it Selah ("pause and reflect"), Bamberger Ranch Preserve. There, he spent decades restoring the land and instilling ethical land stewardship principles in visitors. He also created the Chiroptorium, an artificial bat cave that is now home to hundreds of thousands of Mexican free-tailed bats (*Tadarida brasiliensis*). Bamberger's conservation legacy lives on at Selah.

Enhance Your Bat Education

Hundreds of resources offer learning opportunities for all ages

BCI's extensive library of learning resources is now more accessible than ever. It brings together hundreds of materials for all ages, with content available in both English and Spanish. Intuitive filters make it easy to find age- and grade-appropriate lessons, including many designed specifically for educators. Readers can explore a wide range of offerings, from lesson plans and videos to activity pages and recipes, featuring curricula such as "Back Yard Bativists" and "Discover Bats."



The revamped BCI Learning Resources page adds more accessible features.

★ Explore BCI's learning resources: batcon.org/about-bats/learning-resources

Agave Restoration Initiative in the Spotlight

BCI featured on United Nations "Decade on Ecosystem Restoration Hub"

BCI's Agave Restoration Initiative is now featured on the United Nations (UN) Decade on Ecosystem Restoration Hub. Used by those who are implementing restoration projects, the platform increases visibility for the agave initiative and signals global recognition of its impacts.

The Agave Restoration Initiative was also featured as Restoration Implementor of the Month in the Ecosystem Restoration Hub's February newsletter.

Lesser long-nosed bats (*Leptonycteris yerbabuenae*).



Photo: Bruce D Taubert

★ Explore BCI's Agave Restoration Initiative on the UN Decade on Ecosystem Restoration Hub: hub.decadeonrestoration.org/initiatives/agave-restoration-initiative



SPECIES study

There are 1,500+ species of bats in the world. This is one of them.

A smoky bat (*Amorphochilus schnablii*) flying out of an abandoned mine in Peru's Huancarqui District.

bat stats



Binomial
Amorphochilus schnablii



Family
Furipteridae



Colony Size
Found in colonies of up to 300 bats



Weight
3 to 5 grams



Diet
Insectivorous



Status
Endangered

Region

In the extreme south of Ecuador, the extreme north of Chile, and along the coast of Peru



Smoky Bat

Peruvian project aims to create artificial roosts for distinctive bat

By Lindsay Lee Wallace

With tiny thumbs that are barely visible, the smoky bat (*Amorphochilus schnablii*) is a distinctive-looking and memorable bat, according to Melquisedec Gamba-Rios, Ph.D., BCI's Regional Director, Latin America & Caribbean.

"It made me smile when I saw it for the first time. It's a hilarious bat," he says. "The thumbs are very reduced, so they're barely visible."

This rare bat is a member of an extremely small family with just two members, both Endangered insectivores native to South America. The smoky bat and its relative, the thumbless bat (*Furipterus horrens*), are both known to tuck their small thumbs into the front wing-edge, which is believed to make them more aerodynamic.

"They are very fast," says BCI's Brazil Program Manager Jennifer Barros, Ph.D. "You just see a tiny ball of fur flying around."

But the smoky bat isn't just a pretty, tiny face—it's also a crucial part of the ecosystem in coastal Peru, where the majority of species live in caves and former mining tunnels that date back more than 200 years to Spanish colonial rule.

Getting the community involved

Smoky bats are very effective insect hunters that help reduce the need for pesticide use in crops and control insect vectors of disease. But over the last decade, renewed mining efforts have disturbed the bat's habitat, reducing reproductive success and putting the current population in peril. The smoky bat's population has declined by more than 50% in the last 10 years.

Today, BCI is partnering with Peruvian conservation and sustainable development organization Sallqa Perú, led by Director Joaquín Ugarte-Núñez, and community members who live throughout the smoky bat's territory. Together, they are working to compensate for the lost habitat with carefully designed artificial roosts.

Getting community buy-in on conservation plans can be challenging at times. Some people may find certain interventions burdensome, while others may have negative sentiments or superstitions about bats. However, when BCI's team took their first trip to Peru to visit one of the mining tunnels the smoky bat calls home, they captured photos and videos of the species and used the footage to turn bat skeptics into eager collaborators.

"We were coming back late at night and praying for a place to have any kind of food because we were starving," Gamba-Rios says. When they finally found a rural restaurant that was open late, they started a conversation and shared videos and images of the bat. "They were really into it," Gamba-Rios says.

Soon enough, the restaurant's staff members were telling BCI's team about another local cave where they had seen the bats. They also expressed interest in hosting the artificial roosts that BCI and Sallqa Perú were planning to construct. "People grow up going into and climbing up these hills, so they have a connection with the habitat and its biodiversity," Barros says.

Building artificial roosts

Made from bamboo and clay, the artificial roosts are modeled after traditional local structures called quinchas. Ugarte-Núñez says the design was inspired in part by the fact that smoky bats were already living in the abandoned human-constructed tunnels. Two other species of bats are also roosting in the artificial quinchas, including the Endangered Atacama myotis (*Myotis atacamensis*). BCI is also working with the Peruvian government to create tax incentives for property owners who agree to host an artificial roost on their land.

Ugarte-Núñez says that by encouraging more community members to host the artificial roosts, "We can protect the sustainability of these reproductive colonies, so we can see the size of the population grow."

Gamba-Rios emphasizes that working together with the community is vital when establishing conservation efforts. "We're always trying to find how we can benefit the community and help them take ownership of the work, because that's the best strategy for the long term," he says. 🦇



The smoky bat (*Amorphochilus schnablii*) is listed as Vulnerable on the IUCN Red List.

Photo: Jennifer Barros, Ph.D.

"We're always trying to find how we can benefit the community and help them take ownership of the work, because that's the best strategy for the long term."

—MELQUISEDEC GAMBA-RIOS, PH.D.



Projects safeguard caves while providing community benefits

By Lindsay Lee Wallace

Protecting KENYA'S CO

Seventy percent of the Endangered Hildegard's tomb bat (*Taphozous hildegardeae*) population in Kenya is concentrated in just two locations: the Kaboga and Makuru caves that are located near Watamu, a rapidly developing tourist destination, and the Tswaka Three Giant Sisters Caves outside rural Fikirini Village.

In these locations, as well as throughout coastal Kenya, Endangered bats are threatened by habitat loss, deforestation, and urban expansion, as well as disturbance of cave roosts. To protect these bats, BCI has spent the last three years building relationships with local partners and community members to create positive change for bats and people.

Protecting bats as tourism grows

In 2024, BCI purchased the Kaboga Cave site outside Watamu to protect it and then transferred ownership to sustainable development enterprise Angaza Vijiji so that the site could be locally managed.

"We were worried that the cave would be flattened at some point," says BCI's Kenya Program Manager David Wechuli, Ph.D. "If we didn't hurry, another building would be there."



Learn more about
BCI's Kenya work:
batcon.org/nightwatch

BCI's work in Kenya protects Endangered Hildegard's tomb bats (*Taphozous hildegardeae*) and other species.

the Bats of ASTAL CAVES

A horseshoe bat at the Three Giant Sisters Caves near Fikirini.

Photo: Horizonline Pictures

A perimeter wall protects Kaboga Cave.



Photo: David Wechuli, Ph.D.

Now, a perimeter wall protects the cave along with half an acre of land around it, where vegetation thrives, and Hildegard's tomb bats can roost alongside other species like the African trident bat (*Triaenops afer*) and striped leaf-nosed bat (*Macronycteris vittata*).

Beyond the perimeter wall, the town is expanding and industrializing to accommodate its growing popularity as a tourist destination on Kenya's beautiful southeast coast. While Watamu's development provides a boost to the local economy, it threatens the habitat of the Endangered Hildegard's tomb bat.

Evarastus Obura, founder and CEO of Angaza Vijiji, points out the importance of sustainable development, saying, "We can appreciate that development is happening, but how do we develop without compromising the integrity of natural resources around us?"

Now, BCI, Angaza Vijiji, and partners are working to make use of the land within the perimeter wall to benefit the community. Together, they are exploring the possibility of planting demonstration kitchen gardens at the site. These would help

Meeting with the members of the Tswaka community-based organization to discuss the management of the caves and surrounding landscape.



Photo: Isabella Mandl, Ph.D.

"[This project] requires us to be very flexible and adaptable, and to listen closely to our local collaborators and partners. We need to make sure that everyone who needs to be at the same table to discuss what's going to happen is at that table."

—ISABELLA MANDL, PH.D.

communities grow produce both for their own meals and to sell for a small profit, while also keeping the land healthy even as the surrounding modernization continues.

Cultivating trust

Around 200 kilometers down the coast from Watamu sits Fikirini Village, where bats live in the Tswaka Three Giant Sisters Caves. When Isabella Mandl, Ph.D., BCI's Regional Director for Africa & South Asia, began to work together with partners and the village's residents several years ago, the team learned about the cultural and religious significance of the caves and how the COVID-19 pandemic made residents especially wary of the bats that lived there.

Additionally, Mandl and her team learned that the forest, which served as an important hunting ground for bats, was a vital resource for community members who harvested wood for cooking fires and construction.

When Mandl and other BCI representatives first arrived in Fikirini, they focused on getting to know the local community.

Coral limestone caves are fragile ecosystems.





Photo: Isabella Mandl, Ph.D.

The community grows native trees for reforestation in the conservation area and broader landscape.

“The trust-building phase was the better part of two years,” she says.

BCI’s team met with community members and shared how the bats benefit residents by pollinating crops, eating the mosquitoes that spread malaria, and drawing potentially profitable ecotourism to the area. “After we had meetings and education

hours with community members, they began to appreciate why they should be part and parcel of this initiative to protect the caves,” Wechuli says.

The creation of a community-based organization (CBO) established local leadership structures for organizing conservation work. Fikirini and BCI worked together to create two tree nurseries that are now growing more than 20,000 native tree seedlings. While they were originally only intended to reforest the conservation site, the nurseries have been so successful that the village is now selling seedlings and trees to the Kenyan government and other organizations seeking to restore forest areas across the coast.



Photo: Jon Randers, Ph.D.

This initiative is part of BCI’s training program designed to provide multiple streams of income for individuals and the community. Some of the training opportunities offered have included catering, handicrafts, and the construction of energy-efficient clay stoves.

Planning for the future

Many of these training sessions are in anticipation of the day when coastal Kenya’s expanding tourism industry comes to Fikirini. Although Fikirini village is more rural and farther inland than many current destinations, including Watamu, tourists interested in seeing the bats and the caves where they live are already paying occasional visits.

Within the last year, BCI has worked alongside those in Fikirini to build an Information Center to serve as a hub for both future tourism and the CBO’s operations. As the CBO has become more established, it has coordinated more closely with the county government to address local issues of interest to the community.

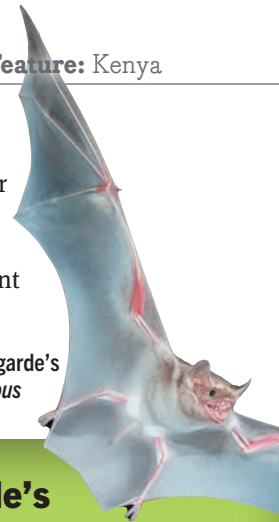
Mandl says that one of the fiercest advocates for truly sustainable tourism she’s worked with in Kenya was Ali Toya, a longtime BCI collaborator and bat guide who passed away in 2025.

“Ali was a force of nature,” Mandl says. “He was telling me about all these great ideas to promote ecotourism, how we could get tourists interested but not disturb the bats. The community already had a way of thinking about how to protect the site.”

Going forward, Mandl is optimistic about how these projects in Kenya will continue to progress, and what the organization can learn about continuing to improve on its sustainability initiatives.

“It requires us to be very flexible and adaptable, and to listen closely to our local collaborators and partners,” she

Endangered Hildegard’s tomb bat (*Taphozous hildegardeae*).



Hildegard’s Tomb Bat

The Endangered Hildegard’s tomb bat (*Taphozous hildegardeae*) lives in coral caves along the coastlines of Kenya and Tanzania and has a very limited range. By protecting the Kaboga and Makuru caves, as well as the Tswaka Three Giant Sisters Caves, BCI hopes to allow the bats to thrive. This will also create an opportunity to learn more about this mysterious bat.

“I’m looking forward to having a concerted effort for conservation, but also working with our colleagues in the country to do research to understand these animals’ behavior,” says BCI’s Kenya Program Manager David Wechuli, Ph.D. “We need to understand their population dynamics and feeding patterns.”



Learn about sustainable development enterprise
Angaza Vijiji: angazavijiji.co.ke

says. “We need to make sure that everyone who needs to be at the same table to discuss what’s going to happen is at that table.” 

Photo: Dr. Paul Webala

Hiledgarde's tomb
bat (*Taphozous*
hiledgardeae).



STRATEGIC PLAN SUCCESS



Photo: Marcelo Martins

Student Scholar Angélica Yantén in the field.

As dusk settles over rolling hills, quiet valleys, and remote landscapes, countless bats take flight, navigating the night sky with astonishing precision. For BCI and partners, each wingbeat represents years of dedicated research, careful planning, and hands-on conservation. Over the past five years, BCI's 2020–2025 strategic plan has guided initiatives that not only protect bats and their habitats but also generate new scientific insights and cultivate communities as long-term stewards of the environment.

From protecting critical roosts to restoring degraded landscapes, advancing research, tackling emerging threats, and inspiring global audiences, BCI's recent work showcases the power of long-term strategy, rigorous science, and community-driven conservation.

Here are just a few of BCI's accomplishments during the 2020–2025 strategic plan period.

*Looking at BCI's
2020–2025
accomplishments*

By Fiona Tapp

Bracken Cave Preserve is an
integral part of BCI's work.

Photo: Jonathan Alonzo



5 YEARS OF IMPACT

An agave near flowering.

Photo: Horizonline Pictures

Photo: Horizonline Pictures

Endangered
Species
Interventions
Director Jon
Flanders, Ph.D.,
stands at the
entrance to St.
Clair Cave in
Jamaica.

Endangered Species Interventions (2020–2025):

- * 5 caves under permanent protection
- * 5 countries with new protected areas established
- * 2 Critically Endangered bats and 3 Endangered bats saved from imminent extinction
- * 1 Critically Endangered bat, Livingstone's fruit bat (*Pteropus livingstonii*), downlisted to Endangered
- * 1 species new to science identified: Nimba myotis (*Myotis nimbaensis*)
- * 15 countries with active work

MISSION 1

Endangered species initiatives

Protecting Endangered bat species lies at the heart of BCI's work. Over the last five years, BCI has secured vital caves and worked on millions of acres of forests and grasslands essential to bats' survival.

At Stony Hill Cave in Jamaica, BCI intervened to purchase land before it could be sold to a developer, averting the irreversible loss of the last known maternity roost for the IUCN Critically Endangered Jamaican flower bat (*Phyllonycteris aphylla*). The land is now permanently protected by Jamaica's National Environment and Planning Agency (NEPA).

Jamaica's St. Clair Cave is the only known maternity roost for the IUCN Critically Endangered Jamaican greater funnel-eared bat (*Natalus jamaicensis*), and BCI has taken a number of steps to protect the cave, including installing a predator-proof fence to protect bats.

"That cave is home to around 2 million bats of at least 10 different species, so it's really a mega roost, and obviously has this Critically Endangered population in it as well," says Director of Endangered Species Interventions Jon Flanders, Ph.D., who notes

that protecting these sites safeguards entire ecosystems.

In Fiji, BCI, partners, and residents protected Nakanacagi Cave, the only known maternity colony of IUCN Endangered Fijian free-tailed bats

(*Mops bregullae*). Together with partners, BCI purchased the cave and transferred it to the National Trust of Fiji, and it is now Fiji's first-ever protected area for bats.

"Local people are the true custodians of the land," Flanders says. "They are the long-term solution for the protection of the bats and their habitat."

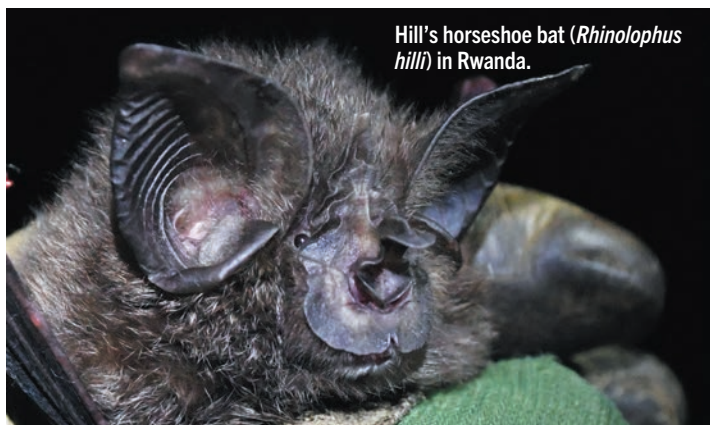
In Kenya, BCI purchased Kaboga Cave, one of the two main roosts for the IUCN Endangered Hildegard's tomb bat (*Taphozous hildegardae*), and local partner Angaza Vijiji now manages the land. In Florida, BCI saved the largest known population of Federally Endangered Florida bonneted bats (*Eumops floridanus*) and saved a key foraging area for the species from a water park development.

One of BCI's most incredible successes over the last few years was the rediscovery of Hill's horseshoe bat (*Rhinolophus hilli*) in Rwanda. The IUCN Critically Endangered species had not been seen in 40 years and was believed to be extinct before BCI rediscovered it, underscoring the importance of persistent fieldwork.

"Discovering the lost species of Hill's horseshoe bat in Rwanda's Nyungwe National Park was one of the major wins for bat conservation in the past five years," says BCI Chief Scientist Winifred Frick, Ph.D. A 2022 BCI expedition to radio-track the species also discovered the first known maternity colony for the species, pointing toward a hopeful future.

"By working with local partners and the global bat research community, we have real hope to deliver on our mission of protecting bats around the world."

—WINIFRED FRICK, PH.D.



Hill's horseshoe bat (*Rhinolophus hilli*) in Rwanda.

Photo: Drew Bantlin

MISSION 2

Protect and restore landscapes

BCI's conservation work is underpinned by science-backed strategies to address threats and protect and restore landscapes ranging from ranch lands to fire-damaged forests, subterranean caves, and mines.

From 2020–2025, the Habitat Protection and Restoration (HP&R) Program's Subterranean Team surveyed 5,639 abandoned mine features across the United States and conserved and protected 475,900 square feet of underground roosting space. HP&R's Restoration Team completed more than 100 miles of watershed assessments, hundreds of spring assessments and restorations, planted thousands of native cottonwood and willow trees, restored dozens of miles of perennial streams, and restored 50 miles of linear and edge habitat along U.S. Forest Service roads.

The team also saved hundreds of millions of tons of topsoil from being lost and clogging up and burying watersheds impacted by the Black Fire. To do this, they aerially reseeded 7,600 acres of land with extreme burn severity located at the headwaters of 10 watersheds. In total, the Restoration Team worked on more than 1.5 million acres of burned National Forest lands to ensure a balanced recovery optimized for bats and their habitat needs. The HP&R Program also invested more than \$5 million dollars in local communities by partnering with local organizations and contractors.

From 2020–2025, BCI assessed and implemented habitat recommendations at more than 2,500 sites.

BCI's Agave Restoration Initiative exemplifies BCI's science-driven approach to landscape protection and restoration. Migratory bats, including the Endangered Mexican long-nosed bat (*Leptonycteris nivalis*),



BCI works underground to protect bats in caves and abandoned mines.

Photo: Josh Hyde

rely on nectar corridors stretching across swaths of the southwestern U.S. and Mexico. From 2020–2025, BCI protected seven critical roosts within the migratory range of pollinating bats and restored significant agave foraging grounds. To further these efforts, scientists and community members planted more than 177,000 agave seedlings, monitored bat activity, and tested restoration techniques to improve agave survival and recruitment.



Agave planting in Tucson, Arizona.

Photo: Horizonline Pictures

Cross-border collaboration is central to success. “We’ve created regional networks to bring people together across these big landscapes,” says Agave Restoration Program Director Kristen Lear, Ph.D. “That sort of connection across borders is really what powers landscape-scale restoration for migratory species.” Exchanges between protected area managers, nurseries, and local communities foster shared knowledge, strengthen regional coordination, and build capacity to address conservation challenges at a continental scale.

Mission 2 also demonstrates how research informs broader conservation strategies. BCI tracks bat populations, analyzes habitat use, and evaluates restoration success to refine methods, ensuring that lessons learned are applied across other landscapes. By linking rigorous science, hands-on restoration, and community engagement, BCI helps to conserve species, maintain ecosystem health, and sustain human livelihoods.



A nursery helps grow plants for restoration efforts.

Photo: Dan Taylor

Photo: Rachel Harper



BCI's work involves surveying for white-nose syndrome.

Two new research directions were established under the 2020–2025 strategic plan: One Health and Conservation Evidence.

Health focus, emphasizing connections between bats, people, and ecosystems. One Health is one of BCI's two new research directions established under the 2020–2025 strategic plan, in addition to Conservation Evidence.

BCI's Student Scholars program fosters a worldwide network of bat researchers whose work represents the future of bat conservation. Over the past five years, BCI funded 71 student research scholarships around the globe, with a total of 80 countries benefiting from the scholarship program since it began in the 1980s.

"The success of this program inspires confidence that the future of bat conservation will continue to expand as research capacity grows around the world," Frick says.

BCI's science also informs policy. The North American State of the Bats Report utilized international expertise to identify conservation priorities, and collaborations like the North American Bat

Monitoring Program (NABat) helped inform federal protections for bats under the Endangered Species Act. The Bats and Wind program generates and disseminates evidence of solutions that can reduce bat fatalities at wind facilities around the globe.

"With 1,500 species of bats and counting and the myriad threats they face worldwide, there won't be one single solution," Frick says. "But by working with local partners and the global bat research community, we have real hope to deliver on our mission of protecting bats around the world."

MISSION 3

Conduct high-priority research and develop scalable solutions

Mission 3 confronts urgent threats to bats, from disease and habitat loss to human-induced risks, turning research into action with measurable outcomes. BCI is an established global leader in bat conservation science, working to improve the scientific knowledge that fuels the fight against threats to bats.

White-nose syndrome (WNS), a deadly fungal disease, is a significant threat, and BCI has successfully developed and implemented multiple innovative strategies, including a "Fat Bat" concept that provides bats with efficient foraging opportunities before and after hibernation to help them survive winter and reproduce.

"We made real progress by testing our 'Fat Bat' strategy and focusing on improving resilience and recovery of remnant populations," Frick says. "The solution will involve systems-level approaches to improve survival and reproductive success of bats endangered by WNS."

Global collaboration amplifies BCI's impact. The MENTOR-Bat program trained early-career professionals from Cameroon, Colombia, and Indonesia on bat conservation with a One

MENTOR-Bat participants set up a mist-net in Colombia.



Photo: Emily Roris_USFWS

MISSION 4

Inspire through experience

Mission 4 recognizes that lasting bat conservation depends on people caring deeply and personally about bats. These efforts focus on networking, advocacy, education, and creating meaningful connections between humans and bats, turning curiosity into commitment.

“People, while they love to learn, really respond emotionally when they have a personal experience with bats in their community,” says BCI Chief of Strategic Partnerships Mylea Bayless. “That’s the experience people have when they realize there are bats literally in the night sky in their neighborhood. You can never unsee it once you’ve seen it.” These moments spark advocacy and foster a deeper understanding of bats’ ecological importance.

Part of BCI’s educational work focuses on an enhanced K–12 educational curriculum that aligns with national standards to increase next-generation understanding and appreciation of bats. BCI scientists also participated in the “I am a Scientist” program, which fosters educational achievement by encouraging high school students to envision themselves in scientific careers and plan their futures.

Over the past five years, BCI launched a program to train partner organizations to host bat nature walks, focused on piloting three community science bat monitoring efforts, and cultivated volunteer opportunities to help people engage directly with conservation while building knowledge, skills, and ownership. The Gardening for Bats program also created 17 native plant lists, two regional garden guides, and 18 bat gardens in four states, in addition to piloting a native seed packet.



Mexican free-tailed bats (*Tadarida brasiliensis*) fly near Bracken Cave.

Photo: Jonathan Alonzo

“It’s amazing watching the ripple effect from these projects and the impact that has on individuals and communities. It’s all linked.”

—JON FLANDERS, PH.D.

Experiences like Bracken Cave flights leave visitors awestruck and foster a long-term commitment to conservation. During the 2020–2025 strategic plan period, BCI enhanced Bracken Cave Preserve by expanding accessibility, capacity, and durability, including partnering with **Explore.org** to incorporate livestreaming of bat flights, adding a Motus wildlife tracking tower, incorporating solar-powered pavilion lighting, enhancing roads, trails, signage, and more. There are also additional opportunities to learn by watching the *Deep in the Heart* film.

By combining personal connection, hands-on learning, and inclusive engagement, Mission 4 ensures that people become active partners in bat conservation. “Essentially, we can’t deliver bat conservation on our own. It’s going to take all of us,” Bayless says. “There’s a very important role for everyone who cares about bats to play, whether in their community or beyond.”

Lessons learned and looking forward

The 2020–2025 strategic plan illustrates that conservation is a long game. “We never stop talking, we never stop searching,” Flanders notes. Flexibility, long-term investment, and genuine partnerships were key to surpassing goals.

Looking ahead, BCI will continue expanding habitat protections, deepening research, mitigating emerging threats, and inspiring communities globally. “It’s amazing watching the ripple effect from these projects and the impact that has on individuals and communities,” Flanders says. “It’s all linked.” 

“There’s a very important role for everyone who cares about bats to play, whether in their community or beyond.”

—MYLEA BAYLESS

Motus towers help researchers learn about bat movement patterns.



Photo: Fran Hutchins

Sister Roosts

Researchers find migratory connection between Bracken Cave and two former mines in Mexico

By Annika Hipple

Santa Eulalia is one of the sites sharing a migratory connection with Bracken Cave.

“Everything that happens on both sides of the border is impacting the populations on all the migratory routes.”

—ANA IBARRA, PH.D.

Every summer evening at dusk, roughly 15 million Mexican free-tailed bats (*Tadarida brasiliensis*) rush out of Bracken Cave near San Antonio, Texas, to feed on insects. Bracken Cave is home to the world’s largest known bat colony, and it has been owned and managed by BCI since 1992. Now, researchers have discovered a migratory connection between this cave and two abandoned mines inhabited by bats in the northeastern Mexican states of Chihuahua and Nuevo León.

Researchers used data from a network of automated radio telemetry towers for tracking wildlife, known as Motus towers, to track a bat that was recorded at Bracken Cave all the way to Las Cavernas de Santa Eulalia in Chihuahua. Bats that visit both sites are also believed to visit another cave, La Cueva de la Boca in Nuevo León. While researchers are working to learn more about the bats’ movement patterns, BCI scientists say that conservation efforts must be designed to consider a migratory landscape that includes Bracken Cave, as well as its two “sister” roosts in Mexico.

“These roosting sites are connected somehow demographically,” says Ana Ibarra, Ph.D., BCI’s Regional Director, Mexico & Latin America. She says BCI is closely collaborating with other organizations in Mexico since “everything that happens on both sides of the border is impacting the populations on all the migratory routes.” Ibarra and other researchers believe the bats’ movements are likely tied to seasonal insect populations that are correlated with crop growing seasons.



Learn more about
Motus towers:

[digital.batcon.org/issue/
volume-45-issue-1/
from-birds-to-bats](https://digital.batcon.org/issue/volume-45-issue-1/from-birds-to-bats)

BCI and partners visit La Cueva de la Boca to discuss potential monitoring, research, and outreach opportunities for the site.



Photo: Diana Gonzalez

Photo: UACH

In Chihuahua, Sergio Luévano, is a lecturer at the Universidad Autónoma de Chihuahua. He has advocated for the preservation of the Santa Eulalia site since 2018, when he learned about a very large bat colony inside the mine. Luévano says monitoring has revealed that the site is a maternity roost for Mexican free-tailed bats, which start arriving in May and give birth about a month later. These bats spend several months foraging in the area before migrating further south in early November. Studies suggest a genetic relationship between bats from Santa Eulalia and those from Bracken, though there is still much to learn about the degree of migratory connectivity.

Meanwhile, in Nuevo León, the Mexican environmental organization Pronatura Noreste has worked on conservation at La Cueva de la Boca for many years, though the site's role in the larger ecosystem is not yet fully understood.

Last year, Luévano and Diana González, who coordinates Pronatura's education and fundraising, visited Bracken Cave. "It was a wonderful exchange of experiences that helped us identify potential avenues for action," González says. "We even created a map revealing that the connections between these sites form a distinct triangle." She says their mapping revealed 460 miles (740 kilometers) between Bracken Cave and Santa Eulalia, with 312 miles (502 kilometers) of distance between the Nuevo León site and Bracken Cave.

Fran Hutchins, Director of the Bracken Cave Reserve, appreciates the opportunities for collaboration with partners in Chihuahua and Nuevo León and looks forward to enhancing scientific research and community-based conservation efforts.

"Initially, we're looking at the ability to do more science and study the bats, their migration habits, and how they're using these roosts," Hutchins says. "There are also opportunities for ecotourism and education for the communities that are around these roosts, so the bats become 'their' bats as they come to appreciate the bats' value. Because at the end of the day, we can't protect something on somebody else's land. The people who live there are the ones who have to protect it." 🦇

Lake Vermilion After Dark

Study examines nocturnal activity at northern Minnesota lake

By Fiona Tapp

At sunset on northern Minnesota's Lake Vermilion, the islands stand like fragments of forest set adrift. In early 2025, BCI began listening for what happens there after dark, tracking the bats that might be using these isolated patches of habitat.

"We wanted to find out if there were any significant bat colonies, especially Threatened or Endangered species, using those islands," says BCI Senior Restoration Specialist Dan Taylor.

The work, commissioned by the Bureau of Land Management (BLM), focused on a chain of small, federally managed islands scattered across Lake Vermilion. The islands have mature trees, minimal disturbance, and just enough isolation to make them intriguing as potential bat habitat. More than 300 islands are located within the 30-mile-long lake.

To find out what animals were flying after dark, BCI turned to acoustic monitoring. Over three days in May 2025, Taylor and his team installed five recording stations, each mounted atop a 15-foot pole and aimed toward small forest openings on selected islands.

The detectors recorded nightly from spring through early fall, capturing bat echolocation calls from dusk to dawn for one week each month. This setup provided a low-impact way to monitor wildlife in places that are otherwise difficult to study.

By late summer, the data told a clear story: Bats were using the islands, but not necessarily the species that researchers expected.

Across 175 nights of recording, the team detected five species: little brown myotis (*Myotis lucifugus*), silver-haired bats (*Lasionycteris noctivagans*), big brown bats (*Eptesicus fuscus*), eastern red bats (*Lasiurus borealis*), and hoary bats (*Lasiurus cinereus*). "The most frequently recorded bat was the little

Photo: Ryan O'Leary



BCI studied bat acoustics at Lake Vermilion.

brown myotis, and that bat has experienced 90% declines across much of its range," Taylor says.

The finding was both encouraging and surprising. Once one of the most widespread bats in North America, the little brown myotis has been devastated by white-nose syndrome, a fungal disease that has wiped out entire colonies. Its strong presence on Lake Vermilion suggests the area may still provide important summer foraging habitat, especially over water, where insects are abundant.

Migratory bats like silver-haired and eastern red bats appeared regularly, likely passing through or feeding along the lake's edge.

"There are migratory bats that we expected," Taylor says. "They fly long distances, so you would expect to get them coming through."

Two species of particular concern, however, were notably absent: federally Endangered northern long-eared bats (*Myotis septentrionalis*) and declining tricolored bats (*Perimyotis subflavus*), which were key targets of the study. Combined with habitat data, their absence suggests the small islands, lacking large interior forests and suitable roost trees, may be less important for those species than the mainland.

Encouraged by the results, BLM has already asked BCI to expand monitoring to a much larger site nearby. On a lake defined by its many islands, the next chapter of discovery is already taking shape, one night call at a time. 🦇

Seeds of Change

A Guinea community's understanding of fruit bats evolves

By Stefanie Waldek

In N'Zérékoré, Guinea, a sudden influx of straw-colored fruit bats (*Eidolon helvum*) once sparked fear, suspicion, and even plans for eradication. Today, that same colony is helping reshape how the community understands bats.

The shift in attitude didn't happen overnight, but the bats' arrival did. "There had been no previous records of large aggregations of *Eidolon* in this town until last year," says Natalie Weber, BCI Strategic Advisor for Endangered Species in Africa. She notes that the species is migratory but typically returns to the same seasonal roosts each year. The community was not only surprised, but also wary of their new neighbors.

"Initially, the fruit-eating bats were largely viewed negatively by local communities in N'Zérékoré," says Mamadou Diawara, Executive Director of nongovernmental organization Guinée Ecologie. "They were associated with negative cultural beliefs, health risks linked to certain diseases, and damage to fruit crops."

To repair the relationship between humans and bats, Weber and her colleagues, working as part of a broader *Eidolon* monitoring initiative, partnered with Guinée Ecologie to engage directly with the community. They organized a workshop that brought together stakeholders, government officials, and residents to discuss the bats' ecological role in seed dispersal and pollination and how they can even benefit the community.

Those benefits soon became observable. In the weeks after the bats departed, forestry officials discovered saplings of iroko (*Milicia excelsa*), a highly valued hardwood tree sometimes referred to as African teak, beneath the bats' former roosts.

The community had desperately been trying to plant iroko, but it didn't work," Weber said. "So now they realize bats can help replant this important tree."

Equally important in helping shape the community's evolving opinion about the bats was building trust in Weber and her colleagues. In the workshop, Weber told the community that the bats were migratory and would leave seasonally. When they did, it reinforced confidence in the information being shared. That credibility helped shift attitudes more broadly.

That complicated relationship underscores the need for education, experience, and engagement in the communities across Guinea to ensure the bats' protection and continued coexistence with humans.



A straw-colored fruit bat (*Eidolon helvum*) roosting.

Photo: Steve Gettle Minden Pictures

"Environmental education campaigns have helped debunk certain myths by reducing fear and prejudice toward bats. Bats are increasingly viewed as species beneficial to the ecosystem rather than as pests."

—MAMADOU DIAWARA

"Environmental education campaigns have helped debunk certain myths by reducing fear and prejudice toward bats," Diawara says. "Bats are increasingly viewed as species beneficial to the ecosystem rather than as pests."

But the work is ongoing. *Eidolon* have returned this year and the community's stance on the bats has regressed to some degree, in part due to recent elections that changed local leadership. "We have to redo something like the workshop to refresh memories," Weber says. Eventually, however, she hopes that the team's messages will not only stick in N'Zérékoré but also grow across the country.

The stakes remain high for *Eidolon*. Their arrival in N'Zérékoré may be linked to the loss of roosting sites elsewhere in the region, a growing challenge across West Africa. "The bats came here because they were threatened by humans. Now, humans feel threatened by the bats," says Weber.

That complicated relationship underscores the need for education, experience, and engagement in the communities across Guinea to ensure the bats' protection and continued coexistence with humans.

Photo: Faya Jeannot Simbiano and Guinée Ecologie



A sudden influx of straw-colored fruit bats (*Eidolon helvum*) initially caused concern in a Guinea community.

Studying Bats in the Forests of Cameroon

BCI Student Scholar builds capacity for research and conservation

By Annika Hipple

Deep in the lowland forest of her native Cameroon, BCI Student Scholar and doctoral student Aïcha Gomeh-Djame is breaking new ground as the first person to study bats in Lobéké National Park. The park is part of a biologically rich transborder UNESCO World Heritage Site that also includes protected areas in the Republic of Congo and the Central African Republic.

Data on bats in Lobéké were virtually nonexistent prior to Gomeh-Djame's research, which involved catching about 350 bats in Lobéké that represented a potential 36 different species. She also succeeded in making the first recordings of bat echolocation in the park. "The primary aim of the project was to quantify the impact of roads on the bat diversity, relative abundance, and functional guilds of bats in Lobéké National Park," she says.

Data analysis is ongoing, but Gomeh-Djame's has found that bat diversity is highest in the Forest Management Unit Buffer Zone, not far from the forest entrance. This area has pockets of disturbed areas created by logging activities, with roads and degraded habitats. The lowest diversity was found in the Intact Forest Core Zone. While analyzing the data and genetic samples, Gomeh-Djame also realized that she had discovered a potential new species. While she is not yet ready to reveal details, she says it is in the family Vespertilionidae.

Gomeh-Djame has also provided training and education to national park staff and the local Baka people to improve their understanding of bats and their importance to regional ecosystems. The communities in and around the park largely consist of people who rely on forest resources through semi-nomadic hunting and gathering. They had many negative misconceptions about bats, but these attitudes began to change when Gomeh-Djame introduced them to some of the species she captured.

"I was so happy when someone told me, 'Oh, this bat is cute,'" she says.

The funding from BCI's Student Scholarship program has provided crucial support for Gomeh-Djame's work, which involves two days of expensive travel from her home to her field sites, as well as additional costs for logistics, genetic analysis, equipment, and other essentials. Gomeh-Djame was also part of the Cameroon cohort that participated in the recent MENTOR-Bat program alongside bat researchers from Colombia and Indonesia, as well as BCI staff.

As one of very few women in Cameroon working on bat research and conservation, Gomeh-Djame also appreciated meeting other female bat researchers through MENTOR-Bat,

including BCI's own Director of One Health, Luz De Wit, Ph.D., and Chief Scientist Winifred Frick, Ph.D., both of whom became role models.

"It was such an amazing experience," Gomeh-Djame says. "I learned how to work with people from other disciplines and how to be serious with the work we are doing. We talked about health. We talked deeply about conservation. We talked about people. Without people, without local communities, we can't succeed in conservation."

—AÏCHA GOMEH-DJAME

"Without people, without local communities, we can't succeed in conservation."

Once she finishes her Ph.D., Gomeh-Djame's goals include capacity-building for bat research and conservation in Cameroon, and teaching programs to encourage interest in bats as well as a greater understanding of them. She is also putting the skills she developed through MENTOR-Bat to good use, advising master's students and leading forest fieldwork. Her work is helping inform bat knowledge in Lobéké National Park and helping Cameroon build capacity to advance bat research and conservation. 🦇



BCI Student Scholar Aïcha Gomeh-Djame and eco-guards from Lobéké National Park processing bats in the early morning that were captured the night before.

Photo: Aïcha Gomeh-Djame

Brazil's Caves

BCI dives deep into subterranean protections

Brazil has more than 30,000 known caves, and many of these underground caverns are home to bats, including Endangered species and large colonies. To learn more about these subterranean bat homes and find out how to protect particularly important ones, BCI and partners took inventory of 113 caves, including 52 that were undergoing this process for the first time. The team recorded 33 bat species from seven bat families and confirmed six new hot caves. They also identified threats, including deforestation, unregulated tourism, and vampire bat control efforts impacting other species.

BCI and partners are working with the National Center for Cave Research and Conservation (CECAV/ICMBio) within the National Action Plan for Cave Conservation (PAN Cavernas) to implement actions focused on protecting bats, including testing the first bat gate installed in a Brazilian cave, and to update Brazil's Red List of Endangered Species. The aim now is to support the creation of protected areas, and the development of protocols to minimize negative impacts on bat populations.

A greater round-eared bat (*Tonatia bidens*) flies through the first bat gate installed in Brazil.



Photo: Jennifer Barros, Ph.D.

Thumbless bat (*Furipterus horrens*) is a tiny, fast insectivorous bat that is classified as Vulnerable in Brazil.

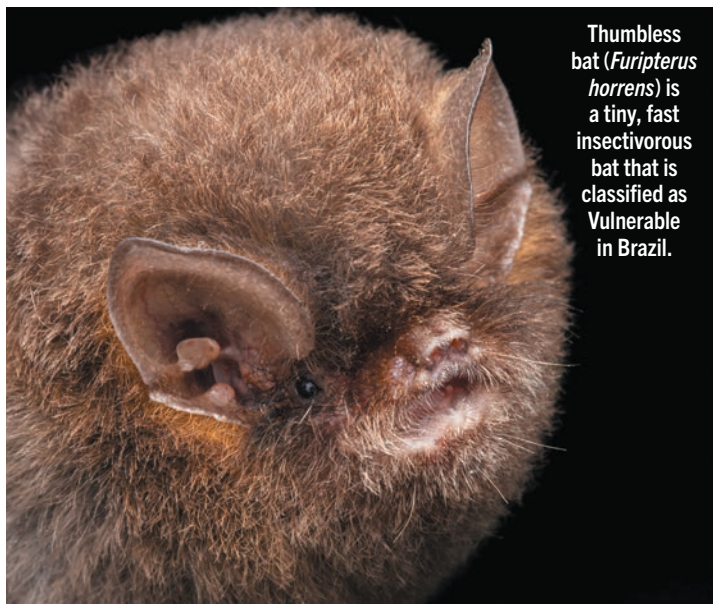


Photo: Jennifer Barros, Ph.D.

Dekeyser's nectar bat (*Lonchophylla dekeyseri*) is a nectarivorous bat, endemic to the Cerrado biome. It is one of Brazil's few endemic species and classified as Endangered in the country.



Photo: Jennifer Barros, Ph.D.

Tomes's sword-nosed bat (*Lonchorrhina aurita*) is an insectivorous bat with a prominent leaf-nose. The species was classified as Vulnerable in the current update of Brazil's List of Endangered Species.



Photo: Jennifer Barros, Ph.D.

Wagner's mustached bats (*Pteronotus rubiginosus*) are insectivorous and form colonies of thousands of bats in hot caves.



Photo: Jennifer Barros, Ph.D.

One of the 113 caves inventoried by BCI and partners.



Photo: Jennifer Barros, Ph.D.

The Brazilian funnel-eared bat (*Natalus macrourus*) is an insectivorous bat that is classified as Vulnerable in Brazil.



Photo: Jennifer Barros, Ph.D.

From Corporate to Cave

Bracken Cave volunteer Steph Dodson shares her conservation journey

By Stefanie Waldek

Steph Dodson didn't start out in conservation. Her first career was in corporate live events, but by her mid-30s, she found herself burned out and searching for something more meaningful. Today, she volunteers at Bracken Cave while pursuing a degree in conservation and wildlife biology, with plans to focus on education and outreach. We spoke with Dodson about her path to conservation and her work at Bracken Cave.

What inspired your interest in conservation?

Growing up, I loved Steve Irwin and wildlife, but I ended up owning a business doing corporate live events. By the beginning of 2024, I was miserable. I was very successful and making good money but needed to make a change. I realized I had been traveling the world to do wildlife stuff and thought to myself, "Well, what if I just made that a career?"

How did you make the transition from corporate events to conservation?

I went back to school in the summer of 2024—in my mid 30s—and graduated with my Associates of Applied Science in conservation and wildlife management. I'll graduate this December with my Bachelor of Applied Science with a focus in conservation and wildlife biology, and then I'm starting my master's next year. My master's will be in conservation education and outreach, because that is where my passion is. I love making personal connections with people about nature.

How did you get involved with bats and Bracken Cave?

What does your work at Bracken look like now?

I had seen the bats come out from Austin's Congress Bridge when I was a kid, because that's a thing you do when you grow up in Central Texas. I say this sadly: I was not enamored with the bats. In the fall of 2024, I was in a wildlife identification class, and I volunteered through the Texas Master Naturalists program and learned even more about bats. On a field trip to Bracken Cave, I was blown away, and I immediately decided to start volunteering there.

For my degree's practicum, I approached Fran Hutchins, Director of Bracken Cave Preserve, and Krystie Miner, Project



Volunteer Steph Dodson at Bracken Cave.

Coordinator for Bracken Cave Preserve, to do research. So far, I have conducted a species richness project, collected dark sky data and guano, and even caught bats with Ph.D. candidate Kristin Dyer from the University of Oklahoma, who uses Bracken as one of her main research sites. I'm also looking at how drought, weather patterns, and moon illumination and phase affect bat emergence from the cave, and I am cowriting a scientific paper about those findings. I'm also the unofficial videographer of Bracken Cave, using equipment from my past career.

What advice would you give to others who want to get involved in conservation?

Start with the community science platform iNaturalist on your own, then find a conservation organization near you—they always need dedicated volunteers. If you have a Master Naturalist program near you, that's a really great place to get started. And you can further your education with free resources like webinars. The bottom line: Talk to everyone you know about the things you love in conservation. 🦇



Photo: MGambaRios

Studying the guano of the Endangered Florida bonneted bat (*Eumops floridanus*) helps researchers learn more about the species.

“By studying guano, researchers can better understand what these bats are eating and how they’re using the landscape around them.”

—MELQUISEDEC GAMBA-RIOS, PH.D.

That information is especially important in Pennsylvania, where bat populations are recovering from white-nose syndrome, a disease that has devastated colonies across North America. Christiano and her research team are collecting guano here during key times of year to understand what bats eat before hibernation, when building fat reserves is critical for survival.

The project is a collaboration with the Pennsylvania Game Commission that aims to better understand how bats

use their environment. By analyzing guano alongside available insect populations, the team can pinpoint which prey species matter most.

“If we can identify which insects are important, and which ones are high in fat, we can help bats have the resources they need to survive the winter,” Christiano says. Those insights can shape conservation strategies, from planting vegetation that attracts key insects to managing habitats so bats have access to the foods they need to survive.

Further south, guano is helping scientists support one of the country’s rarest bats: the Endangered Florida bonneted bat (*Eumops floridanus*). Found only in South Florida, this species faces unique challenges as it navigates a mix of natural and urban environments.

“By studying guano, researchers can better understand what these bats are eating and how they’re using the landscape around them,” says Melquisedec Gamba-Rios, Ph.D., BCI’s Regional Director for Latin America and the Caribbean.

Identifying the insects Florida bonneted bats rely on can help guide habitat restoration efforts, inform where to place bat houses, and shape recommendations for native plants that attract their prey. It also highlights bats’ role in controlling insect populations, including agricultural pests.

This research shows how bat guano can connect the dots between diet, habitat, and survival. Getting more accurate information about what bats eat and where they find their food gives scientists a roadmap for protecting bats and the ecosystems that depend on them. 🦇

What’s in a Pile of Guano?

A Lot, Actually

New discoveries from bat poop science

By Jill Robbins

From the forests of Pennsylvania to urban South Florida, researchers are using guano (bat poop) to unlock new insights about what bats eat, where they hunt, and how to better protect them.

Bat guano offers a workaround to one major challenge: Bats are incredibly difficult to observe while feeding.

“Watching a bat forage naturally and being able to identify the insect it just ate is, for most people, impossible,” says BCI Research Scientist Brandi Christiano, Ph.D.

Most bats forage at night and in places that are largely inaccessible to humans, whether that’s high in the forest canopy, skimming over water, or darting through dense vegetation. Using a specialized technique called DNA metabarcoding, researchers extract genetic material from guano and match it to DNA from known species, creating a snapshot of a bat’s diet across different environments and seasons.



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