



BAT WEEK

October 24-31

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BAT CONSERVATION INTERNATIONAL

bats

THE STATE OF India's Bats

*Report brings researchers together
to conduct nationwide assessment*

INSIDE

- 06** Harrison's Large-Eared
Giant Mastiff Bat
- 08** Beyond the Bats of Bracken
- 25** Unlikely Allies



**BAT CONSERVATION
INTERNATIONAL**

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The choices you make today can help shape a future where bats continue to pollinate plants, support healthy ecosystems, and thrive in the wild. As you plan your year-end giving, consider options that may help you support bat conservation while maximizing your financial and tax benefits.

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Whatever giving method you choose, your generosity helps protect vital habitats, advance conservation science, and ensure bats remain part of our world for generations to come.



Learn more at
batcon.org/waystogive.

INSIDE THIS ISSUE

14



Photo: Rohit Chakravarty, Ph.D.

★Read past issues of *Bats Magazine* at batcon.org/batsmag

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FEATURES

08 BEYOND THE BATS

Meet the volunteers of Bracken Cave Preserve

14 THE STATE OF INDIA'S BATS

Report brings researchers together to conduct nationwide assessment

DEPARTMENTS

02 OFF THE BAT

A note from BCI's new Executive Director, Daphne Carlson, DVM, Ph.D.

06 SPECIES STUDY

Working to save Kenya's Harrison's large-eared giant mastiff bat (*Otomops harrisoni*)

24 BAT CHAT

BCI's Director of White-Nose Syndrome Research discusses promising vaccine developments

25 BAT SQUAD

Conserving habitat benefits bats, frogs, and other species

NEWS & UPDATES



19

03 BAT SIGNALS

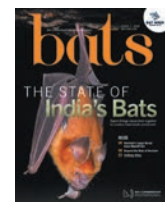
Conservation news & updates

- > Pemba flying fox population grows
- > Saving bats in Singapore
- > Documentary showcases tent-making bats
- > A win for bats at UN meeting
- > New conservation group in Indonesia
- > Celebrate Bat Week
- > Become a Bat Ambassador

18 FIELD NOTES

Research news from around the globe

- > Brazil's hot caves
- > Training wildlife professionals in New Mexico
- > Gila National Forest project
- > Ancient bats



ON THE COVER: Schneider's leaf-nosed bat (*Hipposideros speoris*) is a common species found in Central and Southern India. It's a small- to medium-sized bat weighing about 9–13 grams, and roosts in colonies ranging from 50 to 2,000 individuals.
Image: Rajesh Puttaswamaiah

Photo: Jennifer Barros, Ph.D.

off the bat

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

A Note from Our New Executive Director

Daphne Carlson, DVM, Ph.D.

Smell announces the bats before sight. The sharp aroma of 15 million bats carried on a cool evening after the rains. Recent storms had grounded the colony the night before, so tonight they were hungry. Scout bats tested the air first, darting in tight loops. Then the waves of bats came in quick succession, creating a spiraling mass at the cave mouth before the column bent southeast toward the agricultural fields, the stream of bats swaying left and right like one breathing organism. When the wave swayed directly overhead, the wing beats stirred a breeze against my skin and filled the air with a low, steady drumming. It looked like a waterfall running upwards, with no visible end.

Despite being born and raised in Texas, this was my first Bracken experience, in the days before I officially stepped into this role. What stayed with

me wasn't just the scale, though I'm still not sure how to process 20 million of anything. It was the thought that this same thing was happening in roosts and caves around the world that night, and that Bat Conservation International's work is what stands behind protecting them.

I came to BCI for the focused, evidence-based approach to conservation and the track record of impactful interventions. What hooked me during the interview process was the people, including the staff who carry out that work and the broader community of volunteers, board members, donors, and Roost Members who make it possible. BCI has built an organization with a reputation for excellent science, strong partnerships, and close community engagement. I want to bring everything I have learned in my career so far to help BCI navigate what comes next.

Conservation faces accelerating threats and a shifting funding landscape. We have an incredible foundation to build upon, and these first few months will be for understanding it fully, identifying where the foundation is strongest, and where more is needed, so that, together, we can meet this moment.

Thank you for the welcome I've already received from this community. I look forward to meeting this moment together.

Daphne Carlson, DVM, Ph.D.
BCI Executive Director



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.

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What stayed with me wasn't just the scale, though I'm still not sure how to process **15 million** of anything.



Pemba flying foxes (*Pteropus voeltzkowi*) on Pemba Island.

Pemba Flying Fox Population Grows

Urban habitats lead to concerns about coexistence

In 2024, BCI supported an island-wide survey of the endemic Pemba flying fox (*Pteropus voeltzkowi*) on Pemba Island, which is part of Tanzania's Zanzibar Archipelago. The project, led by Conservation Biologist and Fruit Bat Specialist Tammy Mildenstein, Ph.D., and University of Bristol Professor Tim Caro, Ph.D., recorded a large, stable bat population, which they attributed, in part, to past conservation and awareness campaigns.

The research team visited 64 roost sites, yielding an estimated 27,000 Pemba flying foxes. This is a massive increase over the 5,000 bats that were estimated to live on the island in 1995.

However, they found that 90% of the island's bats are roosting in large groups in urban areas, in contrast to the smaller colonies in villages or forests found in 1995. The team suggests this shift is due to disturbances in the bats' previous roost locations.

Having large groups of bats in urban areas could lead to human-bat conflicts, so the study's authors stress the importance of establishing bat roosting sanctuaries in protected natural areas away from city centers.

★Read the study in *Oryx*:
doi.org/10.1017/S0030605325102238

Saving Bats in Singapore

University students form bat rescue network

When undergraduate student Emma Chao entered Nanyang Technological University (NTU) in Singapore, she learned from senior students that there were numerous grounded bats on the campus. She joined with other students to start formal monitoring based on their observations.

The students established a Bat Response Hotline that takes reports of grounded, injured, and dead bats. The group also conducts regular monitoring efforts and surveys. Most of the bats they find are young Javan pipistrelles (*Pipistrellus javanicus*), with occasional reports of other species. Doctoral student Nicole Dorville is helping oversee their efforts.

Chao's surveys began in 2024. Today, 40–50 students assist with monitoring, response efforts, and walking transects in



Students at Singapore's Nanyang Technological University formed an observation network to monitor grounded bats.

Photo: NTU Grounded Bat Surveys

search of grounded bats. When they find a bat in need, they conduct no-contact measurements and observations and alert local wildlife officials. The students aim to conduct a monthly bat census, through which they hope to learn more about groundings, urban bat viability, and animal fitness.

Leaf Architects

Documentary explores the world of tent-making bats



Photo: Jose Gabriel Barquero

National Geographic Explorer Bernal Rodríguez Herrera, Ph.D., studies tent-making bats in the documentary "Leaf Architects."

While many bats roost in caves, tree cavities, or human-built structures, some bats in Central and South America build their own homes using leaves.

National Geographic Explorer Bernal Rodríguez Herrera, Ph.D., studies all 22 known neotropical tent-making bat species, and his work is showcased in a new documentary film, "Leaf Architects," which was funded by the National Geographic Society, shares his work, research, and fascination with these incredible bats.

"What amazes me most is their ability to build these shelters in the dark, often at night, without any measuring tools," he says. "Even after years of studying them, there are still many questions that continue to spark my curiosity."

★ Watch the documentary: filmfreeway.com/LeafArchitects

Celebrate Bat Week

Plus, get ready for the International Year of the Bats 2027

The last week in October is the time we come together to celebrate Bat Week and all the reasons we love bats. Bat Week takes place Oct. 24–31. Plan your own

Bat Week event, find an event near you, participate in community science projects to help bats, advocate for bats, and learn about bats during this week of bat appreciation.

Next year is the International Year of the Bats, with even more opportunities to celebrate these incredible winged mammals. Now is the time to start planning how you will celebrate bats throughout 2027.



★ Learn more: batweek.org and yearofthebats.org

★ Follow #IYBats on social media to stay up to date: facebook.com/IYBats and instagram.com/internationalyearofthebats

BCI scientists and colleagues present the importance of bat mitigation policy to support global expansion of wind energy.



BCI on the International Stage

A win for bats at the UN Convention of Migratory Species meeting

In March, several BCI representatives attended the Convention on Migratory Species (CMS) Conference of the Parties 15 (COP15) meeting in Campo Grande, Brazil. This important international meeting brings together government leaders, conservation organizations, private-sector representatives, and other stakeholders from around the world.

At the meeting, BCI submitted a Concerted Action giving the African straw-colored fruit bat (*Eidolon helvum*) a formal CMS conservation mandate for 2026–2029, which was approved. This creates an operational platform for coordinated conservation action across the species' African range states.

BCI also organized a side event in collaboration with the CMS Energy Task Force and Brazilian scientist Enrico Bernard, Ph.D., focusing on bat conservation and wind energy.

New Conservation Group in Indonesia

The Indonesian Bat Conservation and Research Union commits to protecting bats

By Lindsay Lee Wallace

A new bat conservation group has formed in Indonesia with the goal of advancing research and preserving and improving bat habitat across the country. The nonprofit organization, called the Indonesian Bat Conservation and Research Union (InaBCRU), was founded by the Indonesian cohort of the MENTOR-Bat program.

Co-led by BCI and the U.S. Fish and Wildlife Service, MENTOR-Bat strengthened research and leadership capacity in early-career conservation practitioners from Cameroon, Colombia, and Indonesia. Members of the Indonesia cohort banded together to create InaBCRU to serve as a collaborative platform for local researchers and conservationists dedicated to protecting bat populations through data-driven research. BCI is working with the organization to expand its reach and help identify projects for collaboration.

At Ngeleng Cave in Java, InaBCRU members collaborate with local guano harvesters to establish harvesting guidelines that protect both livelihoods and bat populations.



Photo: InaBCRU

Become a Bat Ambassador

Learn about bats from BCI Experts | By Lindsay Lee Wallace

On Bat Appreciation Day, BCI launched the new Bat Ambassador Training—a free, self-paced, online course that explores the natural history, ecology, and conservation of bats, featuring talks by BCI scientists and experts.

Join more than 5,000 people from over 70 countries around the world who are already learning about bats in pursuit of becoming BCI Bat Ambassadors. Everyone who completes the Bat Ambassador Training will be eligible to sign up for additional Bat Skills courses, which will roll out over the next several years. These courses will provide Bat Ambassadors with tangible ways to contribute to local bat conservation through community initiatives like bat walks, bat gardens, and community science projects.

★ Become a BCI Bat Ambassador:
batcon.org/bat-ambassador



Congress Avenue Bridge.

SPECIES study

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

Harrison's Large-Eared Giant Mastiff Bat

Species at risk despite a large population in Kenya

By Annika Hipple

bat stats



Binomial
Otomops harrisoni



Family
Molossidae



Colony Size
Up to millions



Weight
26.8–45 g



Diet
Insectivorous



Status
Vulnerable

Region
Djibouti, Eritrea, Ethiopia,
Kenya, Yemen



Harrison's large-eared
giant mastiff bat.

Can a bat be both abundant and Threatened at the same time? In the case of the Harrison's large-eared giant mastiff bat (*Otomops harrisoni*), the answer might be yes. Known from only two cave roosting sites located about 500 miles apart in Kenya, this bat was only recognized as a distinct species a decade or so ago, based on genetic evidence distinguishing it from its sister species, the large-eared free-tailed bat (*Otomops martiensseni*).

The Kenyan caves where the species roosts range from large basalt tubes to vast, high-ceiled cave chambers. One roosting site, Chyulu Hills, is a national park, while the other, Mount Suswa, is a community conservancy managed by local community representatives.

"With only two major roosts for the species, even though those roosts have hundreds of thousands to millions of animals in them, they're still at risk because those are the only places we know them from," says BCI's Director of Conservation Evidence, Teague O'Mara, Ph.D. O'Mara recently visited Mount Suswa to track the bats to determine where they go and how they connect the landscape of southern Kenya when they leave the caves.

Data show that populations fluctuate throughout the year, but it is still unclear whether this is due to movement between the two sites or whether the bats are also spending time in other, unknown locations where they might face additional threats.

BCI's Kenya Program Manager, David Wechuli, Ph.D., has been studying Harrison's large-eared giant mastiff bat and collaborating with the Mount Suswa Conservancy for four years. "*Otomops harrisoni* remains one of Kenya's least understood and most conservation-dependent bat species," he says. "There are still major knowledge gaps about its distribution, population trends, ecology, and long-term viability. The species depends on specialized cave roosts and suitable surrounding foraging habitats, making it particularly vulnerable to habitat disturbance."

Based on current data, Wechuli says that major threats include disturbance of cave roosts from uncontrolled tourism, direct mortality from wind turbines, habitat degradation around the caves due to charcoal production and land conversion for agriculture, vegetation loss that reduces foraging habitat, and general human disturbance during sensitive breeding periods. Another direct threat is pesticide use, which reduces insect diversity and potentially affects the bats' food supply. Climate change, geothermal energy development, and other new pressures on natural resources are likely further impacting roosting and foraging habitats.

Expanding GPS tracking is essential to understanding the species' movement patterns, foraging range, habitat use, and critical feeding areas. Other priorities include monitoring bat populations and potential threats, restoring and protecting foraging habitats, and expanding conservation education and awareness programs in communities surrounding the conservancy.

Wechuli works with the local population to implement a broad range of initiatives to minimize disturbances to roosting bats, including managing visitation by installing protective gates at the caves to regulate access. In collaboration with local stakeholders, bat expert Paul Webala, Ph.D., led the development and submission of a proposal to designate the Mount Suswa

In May 2026, bat experts, students, and conservancy guardians from Maasai Mara University, BCI, and the Mount Suswa Conservancy East came together to track Harrison's large-eared giant mastiff bats (*Otomops harrisoni*) with the goal to identify foraging and roosting sites for this rare species.



Photo: Teague O'Mara, Ph.D.

Conservancy as a Key Biodiversity Area, which would provide greater protection for the site and potentially attract greater financial investment in conservation.

Along with funding, monitoring, and managing visitation, challenges include changing negative public perceptions of bats and balancing conservation objectives with tourism and community livelihoods. According to Isabella Mandl, Ph.D., BCI's Regional Director for Africa and South Asia, one goal is to use data collected through GPS tags to determine where the bats go, then integrate important foraging areas into a comprehensive conservation plan. Wechuli is currently working with local partners to reduce pressure on natural resources by developing alternative sources of income and involving local communities in conservation through training, education, and collaborative management.

"Otomops harrisoni remains one of Kenya's least understood and most conservation-dependent bat species."

—DAVID WECHULI, PH.D.

Tourism is a key part of the issue. Tour groups often make impromptu stops at Mount Suswa en route to Nairobi from some of Kenya's most popular national parks. Designated Bat Guardians from the Mount Suswa community guide visitors responsibly in caves, report threats, educate both visitors and locals about bat conservation, as well as act as liaisons between the community and interested outside parties.

"Historically, attitudes toward bats have often been influenced by myths, misconceptions, and fear, with many people associating bats with bad omens or disease," Wechuli says. "However, attitudes have been improving through sustained education and awareness meetings. Many community members now better understand the ecological importance of bats in insect control, pollination, and ecosystem health. There is growing appreciation that healthy bat populations can support biodiversity conservation and responsible nature-based tourism, although continued outreach remains necessary."

Mandl points out the growing awareness about the importance of bats locally, saying, "There's a lot of local pride in the bats and knowing that they have something they can't find anywhere else in Kenya." 🦇

Bracken Cave Preserve relies on a
dedicated group of volunteers.

Beyond



the Bats

*Meet the volunteers of
Bracken Cave Preserve*

By Jill Robbins

Most people come to Bracken Cave Preserve for the bats, since it's home to the largest known bat colony in the world. On summer evenings north of San Antonio, visitors gather in the viewing area, waiting for the first movement at the cave mouth. Then the spiral begins: more than 15 million Mexican free-tailed bats (*Tadarida brasiliensis*) pour into the sky in an inky black ribbon that twists upward before spreading across the Hill Country.

*“People think of
Bracken as just a cave.
But it’s so much more.”*

—FRAN HUTCHINS

What most visitors don’t see, or even think about, is what happens before and after the bat flights.

Earlier that same day, volunteers may have been clearing trails in the Texas heat, leading a butterfly survey, searching for hard-to-find Endangered plants, or teaching children why bats matter to Texas ecosystems.

“People think of Bracken as just a cave,” says Fran Hutchins, Director of Bracken Cave Preserve. “But it’s so much more.”

That “more” stretches across roughly 1,500 acres of protected Hill Country habitat supporting not only the world-famous bat colony, but also birds, butterflies, reptiles, native plants, and at least eight other species of bats. Much of the work that keeps the preserve functioning is powered by volunteers.

A preserve bigger than the cave

The preserve’s volunteer program began growing in earnest around 2013. Now, roughly 300 volunteers contribute thousands of hours annually, from trail maintenance and visitor education to wildlife surveys and habitat restoration. Many volunteers come to the preserve through the Texas Master Naturalist program, a statewide conservation education initiative that trains volunteers in ecology, wildlife, and land stewardship.

Others simply fall in love with the preserve and keep showing up.

“We make it fun,” Hutchins says. “If you don’t want human contact, you can work on trails. If you love talking to people, you can teach kindergarteners or other groups about bats. There’s a lot to do.”

That variety is part of what keeps volunteers engaged year after year.

“Most people don’t know it’s not just one cave, but caves, plural,” says Hutchins, who came to the preserve through an

Dana Murray (third from right) and fellow Bracken volunteers and staff before a Bracken Bat Flight tour.



Photo: Randon Martinez

Bracken Cave Preserve covers 1,500 acres.



Photo: Jonathan Alonzo

Volunteer Karla Kahn surveys a cave for fungal pathogens in north Texas.



Photo: Krystie Miner

interest in caving. “We have one big cave, which is Bracken Cave, but to date, we have discovered an additional 15 smaller caves. One of our volunteers, Dana Murray, discovered a cave while doing a karst survey.”

During bat flight season, which runs from May through September, volunteers help coordinate parking, greet guests, check reservations, and guide visitors through the preserve before leading interpretive talks about the bats and the surrounding ecosystem. But once bat season slows down, the work continues.

Volunteers conduct bird and butterfly surveys, monitor cave systems, assist with white-nose syndrome (WNS) research, maintain trails, document species through the iNaturalist app, and participate in “BioBlitzes,” which are community science events where participants identify as many species as possible over a set period of time.

“We’re not just bats,” says volunteer Karla Kahn. “We have bees, birds, plants, butterflies, and more.”

Kahn, who has a professional background in research science, first discovered Bracken through the Texas Master Naturalist program. She said volunteering at the preserve reconnected her with science and the outdoors after years away from research work.

Now, she assists with bat surveys, cave research, and a Tulane University project studying swanflower (*Aristolochia erecta*), which is the only plant where the pipevine swallowtail butterfly (*Battus philenor*) lays its eggs.

“There are 1,500 acres out there, and Fran has charged us with finding this tiny little plant hidden in the grass and marking each one with a flag,” Kahn laughs.

Everything is connected

Volunteer Coco Brennan also came to the preserve through the Texas Master Naturalist program more than 20 years ago. She now splits her time between community outreach and community science projects.

Some days, she’s leading surveys of golden-cheeked warblers (*Setophaga chrysoparia*), an Endangered species of bird. Other days, she’s visiting schools or community events, teaching children about bats.

“I’ll go anywhere and talk to anybody about bats,” Brennan says. “I’ve talked to garden clubs, schools, community groups, whoever wants to listen.”

The golden-cheeked warbler and Bracken’s famous bats rely on different parts of the preserve, but volunteers say the connection between them is the habitat itself. The bats depend on the cave system, while the warblers nest only in Central Texas woodlands containing mature Ashe juniper and oak trees. Protecting the preserve means protecting all of it together.



Volunteer Coco Brennan teaches third-graders about Bracken Cave Preserve.

Photo: Coco Brennan

“The bats are here because of the cave,” Brennan says. “The birds are here because of the habitat. The insects are here because of the plants. They all depend on each other.”

Each spring, trained volunteers conduct repeated golden-cheeked warbler surveys across the preserve, returning to the same locations multiple times throughout nesting season to document sightings and songs. The surveys help Bracken maintain its designation as an Important Bird Area through BirdLife International.

For many volunteers, those surveys reinforce that Bracken functions as a full ecosystem rather than simply a tourist destination that’s famous for bat flights.

“It’s not just the bats. It’s the landscape we protect, the plants, the insects, the birds. It’s all connected.”

—COCO BRENNAN

Volunteer MV Barnes dressed as a bat in San Antonio's annual Fiesta Parade.

Bracken Cave Preserve stretches across roughly 1,500 acres of protected Hill Country habitat.

"It's not just the bats," Brennan says. "It's the landscape we protect, the plants, the insects, the birds. It's all connected."

Building community through conservation

For volunteer and artist MV Barnes, Bracken became both a conservation project and a creative outlet.

A graphic artist by trade, Barnes has designed everything from trail signs and maps to gift cards for the preserve. More recently, she completed a mural wrapping around Bracken's bird blind featuring native wildlife and plants found throughout the property.

The mural depicts skunks, birds, cacti, grasses, and Hill Country flora, reflecting the broader ecosystem volunteers work to protect.

"There are animals and plants people may never even notice when they come out for the bat flights," Barnes says. "I wanted the mural to reflect all of it."

The mural also includes two human figures: longtime volunteers Don and Edith

Bergquist, a retired couple whose property borders the preserve, and who have become mentors and welcoming fixtures within Bracken's volunteer community. Barnes and other volunteers describe the Bergquists as part of the culture that keeps people returning year after year.

The Bergquists became connected to the Bracken Preserve shortly after building a house on a hill near the cave, which their real estate agent didn't tell them about. They were sitting on their porch enjoying a glass of wine one evening and were surprised to observe a vast swarm of bats fly out. They visited the preserve the next day to learn more about what they'd observed, and the rest is history.

"I probably wouldn't be talking to Bats Magazine if it weren't for them," Barnes says of the Bergquists. At sunset, the couple can often be seen riding around the preserve on their ATV.

Describing herself as "an introvert by nature," Barnes says leading a public-facing bat tour once would have felt intimidating. But when Don Bergquist suggested she try it, she found herself saying yes without hesitation.

Like many volunteers, Barnes started with physically demanding land management projects before eventually becoming a lead docent during bat flight season. She now guides tours, leads public hikes, and helps with educational programs throughout the year.

Volunteer MV Barnes and the mural she created.

Photo: Krystle Miner

Photo: Rhonda Neel

“The bat flights are magical,” she says. “But the best part is really the community out there.”

That sense of community comes up repeatedly among volunteers. So does a kind of shared curiosity. Many describe Bracken not only as a place to teach others about nature, but as a place where they are still constantly learning themselves. Barnes described Bracken as “my happy place,” adding, “It makes the seven-year-old in me very happy.”

Volunteer Dana Murray similarly describes the preserve as “a wonderland.”

“There’s just so much trust out there,” Murray says. “They let volunteers help represent the preserve and the bats and the science. That’s special.”

Over the years, Murray has participated in cave surveys, bird projects, educational outreach, and bat flights. Like others, she said many visitors don’t fully understand what a preserve actually does.

“We’re preserving what’s already there,” she says. “You can’t preserve something unless you understand it first.”

Volunteers also shared vivid memories of moments that deepened their connection to Bracken and its mission.

Moments of wonder

A standout volunteer moment for Barnes came when she had the opportunity to ride a bicycle in a San Antonio parade, dressed as a bat. “We partnered with BCycle, a local electric bike share company, and rode in the Fiesta Parade,” Barnes explains. “It was so much fun.” Fiesta San Antonio is a citywide two-week celebration each April and the preserve’s lighthearted participation reinforces how much the volunteers, and the bats, are tied to this community.

Kahn had a different kind of “wow” experience. While visiting Bamberger Ranch Preserve in nearby Johnson City to do a WNS survey, Kahn found herself in the middle of a “batnado.”

“The ranch owner had built a man-made bat cave on his property that was inspired by Bracken Cave, which was pretty incredible to see,” Kahn says. “I stepped into this cave and all of a sudden, I found myself standing in the middle of these swirling bats and feeling the bats all around me. I was inside the bat tornado, and I was just in awe.”

Kahn adds that this experience isn’t something that a visitor to the preserve would get to do, although they do get close enough to see this in action. Sometimes a wind shift draws the



Photo: Don and Edith Bergquist

tornado-like formation closer to the guests, and they have a more intimate experience with the bats than what is usual.

What visitors don’t see

While millions of bats remain Bracken’s most visible residents, Hutchins said the preserve’s broader mission continues expanding, particularly through research partnerships with universities, wildlife groups, and conservation organizations.

“People come for the bats,” he says. “But then they realize there’s this whole other world out here.”

By the time visitors leave after a bat flight, most never see the volunteers locking gates, checking trails, or preparing for the next day’s survey work.

But the preserve doesn’t go quiet once the bats disappear into the night sky. If anything, that’s when much of the behind-the-scenes work begins. 🦇

“People come for the bats. But then they realize there’s this whole other world out here.”

—FRAN HUTCHINS



Photo: Jonathan Alonzo

THE STATE OF INDIA'S

For decades, India's bats have largely lived in the shadows. Not just at dusk when they emerge to forage, but also in terms of conservation awareness.

India is home to 135 species of bats, making it one of the world's richest countries for bat diversity. The country's bats pollinate flowers, disperse seeds, regenerate forests, and consume enormous numbers of agricultural pests. Yet despite their ecological importance, bats have rarely received the attention afforded to tigers, elephants, rhinos, or other species that fit in the category of "charismatic megafauna."

That is one reason the new "State of India's Bats" report represents such an important milestone.

Developed through a collaborative effort by researchers, conservationists, and institutions from across the country, the report is the first comprehensive assessment of India's bats and the challenges they face. More than a status update, it serves as a roadmap for future research, conservation action, and public engagement.

The report was inspired by BCI's 2023 "State of the Bats" assessment for North America and reflects a growing effort to create regional assessments that identify conservation priorities before species become imperiled.

"It's critical to be able to act quickly when it comes to bat conservation," says Isabella Mandl, Ph.D., BCI's Regional Director for Africa and South Asia. "BCI's 'State of the Bats' reports are

Leisler's bat (*Nyctalus leisleri*)
is found in India.

BATS

*Report brings
researchers
together
to conduct
nationwide
assessment*

By Fiona Tapp



Photo: Rohit Chakravarty Ph.D.

meant to be important resources, highlighting conservation and research priorities and enabling stakeholders to prevent bat extinctions. The 'State of India's Bats' report is the first of its kind to shine the spotlight on local bats and lays the foundation for collaborative action across the country."

But the story behind the report is as significant as the findings themselves.

Uniting a vast country

Creating a national assessment of India's bats was no small undertaking. "India is a vast country with vast biodiversity, but fewer than 50 people are dedicated bat researchers," says BCI's India Program Manager Rohit Chakravarty, Ph.D.

Harish Prakash, Ph.D., is one of the report's contributors, and he sees collaboration as one of its most important achievements.

"The common factor that brings us all together is expertise in bats," Prakash says. "However, all of us have studied different species, asked different questions, and worked in different landscapes. Bringing all this experience and knowledge together through collaboration is the main highlight of this report."

One of the report's most striking findings is how much remains unknown. While many wildlife assessments focus on population trends and long-term monitoring data, bat researchers in India often lack that luxury.

"Whenever we say the 'state of' something, it gives the impression that we're going to put out numbers about population declines, but that's not the case with this report simply because we haven't had that long history of bat research in India," Chakravarty says. "What we focused on in this report is building that knowledge base."

The result is a document that highlights not only what scientists know, but also what they do not know. Researchers still lack basic information about the distribution, population size, ecology, and threats facing many species. Some regions remain especially understudied. For example, Chakravarty says, "We haven't quite scratched the surface of the bat diversity of the Himalayas."

Far from being discouraging, those gaps reveal next steps. One of the most difficult tasks the team

India is
home to
135
known bat
species.



Photo: Rajesh Puttaswamiah

encountered while preparing the report was turning a long list of unanswered questions into a practical roadmap for future research and conservation.

"The challenge was identifying the priorities, and which areas were not the most pressing priorities in the next 10 years," Chakravarty says.

A country of extraordinary bat diversity

India's bats occupy an astonishing range of habitats, from tropical islands and dry forests to cities, caves, agricultural landscapes, and the high Himalayas.

Some of the species highlighted in the report illustrate both the richness and fragility of that diversity. One is the Nicobar flying fox (*Pteropus faunulus*), a species found only in the Nicobar Islands. With development pressures increasing in parts of the archipelago, researchers worry about the future of this little-known bat. "There's a big risk that the species will just vanish while we are being oblivious to its existence," Chakravarty says.

Some species highlighted in the report are known as much for their absence as their presence. "A species called the Peters's tube-nose bat (*Harpicola grisea*) in the Himalayas has not been seen for the last 150 years," he says. "We need more studies just

Launch of the "State of India's Bats" report at WWF-India, New Delhi.



Photo: NCF/BCI

"The 'State of India's Bats' report is the first of its kind to shine the spotlight on local bats and lays the foundation for collaborative action across the country."

—ISABELLA MANDL, PH.D.



A colony of leaf-nosed bats (*Hipposideros* sp.) in a cave.

India has fewer than **50** bat researchers.

to be sure that the species still exists.”

The report also highlights numerous Threatened species whose futures remain uncertain because so little information exists about them. But the project’s scope extends beyond documenting species already at risk. “The spirit in which the ‘State of India’s Bats’ report was made was that not only do we focus on the Endangered species, but we also focus on the common species to prevent them from becoming Endangered in the future,” Chakravarty says.

Bats face many of the same threats affecting wildlife worldwide, including habitat loss, disturbance of roosting sites, urban expansion, and a changing climate. But researchers say negative public perception remains one of the most persistent obstacles to conservation. This was highlighted further during the COVID-19 pandemic.

“The seeds of this were sown during COVID, because that was a time when bat researchers all across the world had to come together,” Chakravarty says. “There was such a high level of misinformation that we had to tackle.” Researchers responded by increasing public outreach and correcting misconceptions.

Conservation solutions already exist

While the report identifies serious threats, it also points toward practical solutions.

One promising area involves protecting bat roosts in historic monuments. “Natural caves have been destroyed in many areas, so these monuments have become bat habitats,” Chakravarty says. Yet protection can be complicated. “The bat lives in a protected habitat, but the bat itself is not protected,” he says.

Greater false vampire bats (*Lyroderma lyra*) roosting in an old temple.



Photo: Rohit Chakravarty

Beyond site protection, the report calls for expanded monitoring, stronger policy support, habitat restoration, and greater public awareness. Prakash hopes future efforts will identify local threats more clearly. “We are lacking in our understanding of all the threats bat species face locally and how it is impacting their population,” he says. “In the next couple of years, I hope we identify such critical threats and work toward mitigating them.”

Ultimately, the report argues that bat conservation is about far more than protecting individual species. As Chakravarty puts it, “Bat conservation is not just a forest department problem or an environment ministry problem. It’s a problem that touches upon and intersects with a lot of human-centered topics like pest control and diseases. Therefore, bat conservation should also be a priority of other government bodies.”

Those connections extend well beyond ecology. “Bat conservation is not a problem of just environmental conservation,” Chakravarty adds. “It links to human health, it links to human economics, it links to human societies, and with that recognition, all of us have a role to play.”

The report’s authors hope it will serve as a starting point rather than a final word.

Prakash envisions the contributors reconvening in five or 10 years to evaluate progress, ideally joined by a new generation of researchers. Chakravarty believes one of the report’s greatest achievements may be the community it helped create.

“One of the biggest intangible outcomes of this report is that we now have a large group of people who are willing to collaborate with each other and advance the state of bat conservation in India,” Chakravarty says.

For a country with extraordinary bat diversity and enormous unanswered questions, that may prove just as valuable as the report itself. 

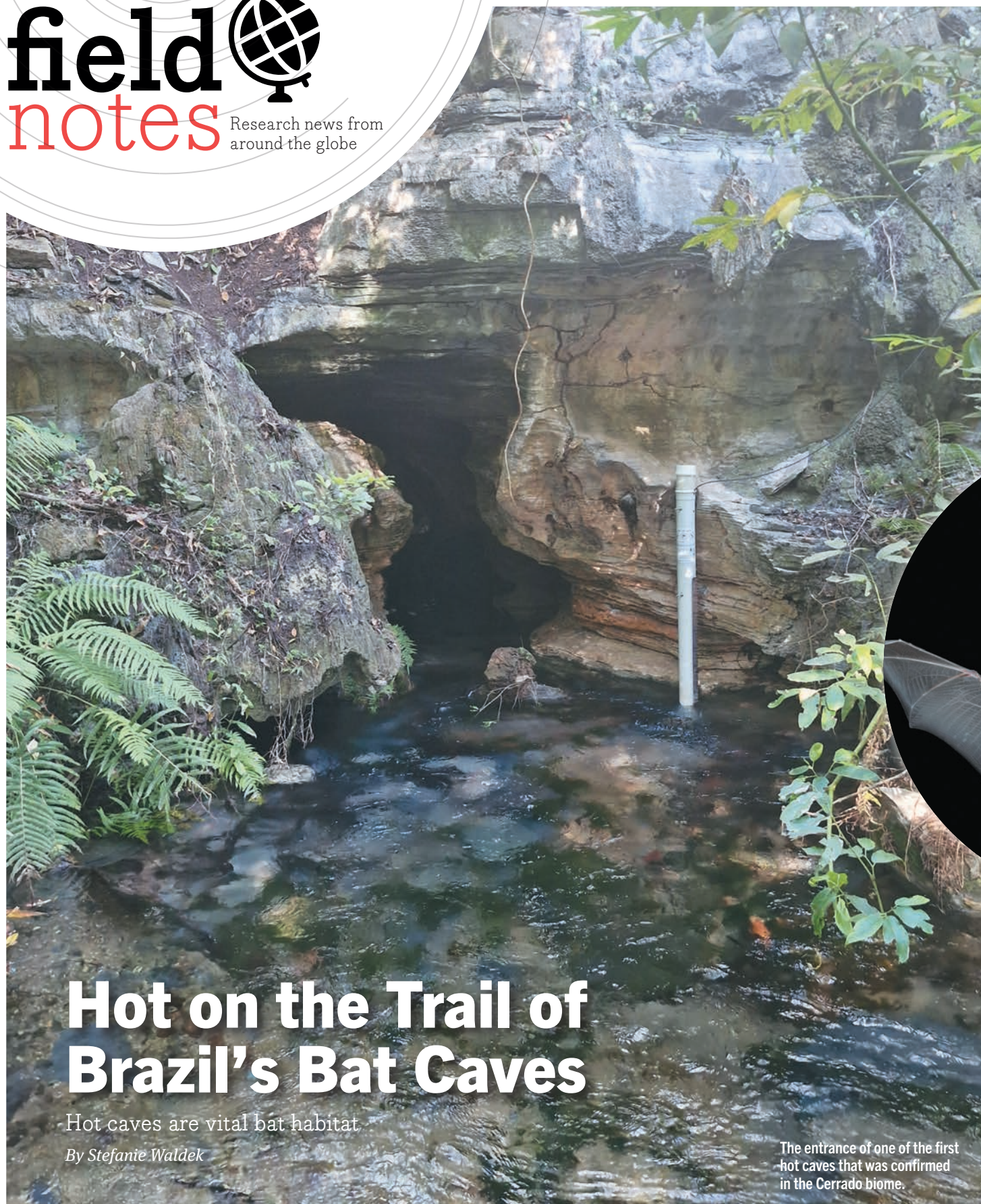
Photo: Rajesh Puttaswamaiah



Greater short-nosed fruit bat (*Cynopterus sphinx*).

“One of the biggest intangible outcomes of this report is that we now have a large group of people who are willing to collaborate with each other and advance the state of bat conservation in India.”

—ROHIT CHAKRAVARTY, PH.D.



Hot on the Trail of Brazil's Bat Caves

Hot caves are vital bat habitat.

By Stefanie Waldek

The entrance of one of the first
hot caves that was confirmed
in the Cerrado biome.

Photo: Jennifer Barros, Ph.D.

Step into one of Brazil's hot caves and you'll immediately understand how they earned their name. Temperatures can reach 104 degrees Fahrenheit (40 degrees Celsius), humidity approaches 100%, and the air feels more like a sauna than a cave. But the heat doesn't come from geothermal activity. "It's the bats," says BCI's Brazil Program Manager Jennifer Barros, Ph.D.

For years, Barros has studied hot caves, rare systems occupied by enormous colonies of bats from the Mormoopidae family. The bats congregate by the tens or even hundreds of thousands in specifically shaped cave environments where they can generate enough body heat to keep their pups—which are born without fur—warm. Their guano contributes to the process as well, fermenting and generating additional heat.

"They are creating the environment that they need to survive and thrive in," Barros says. The result is a unique ecosystem that supports not only the bats themselves, but a broader community of cave-dwelling wildlife.

Brazil is home to more than 30,000 registered caves, but until recently, fewer than 20 were known to qualify as hot caves. Through BCI's Brazil Program and its partnership with the National Center for Cave Research and Conservation (CECAV), Barros and her colleagues are working to assess caves across the country, identify vulnerable bat populations, and prioritize conservation efforts.

So far, the team has surveyed more than 100 caves in 13 Brazilian states. In the process, they have confirmed six previously unknown hot caves: one in the Amazon, two in the Caatinga, and three in the Cerrado,

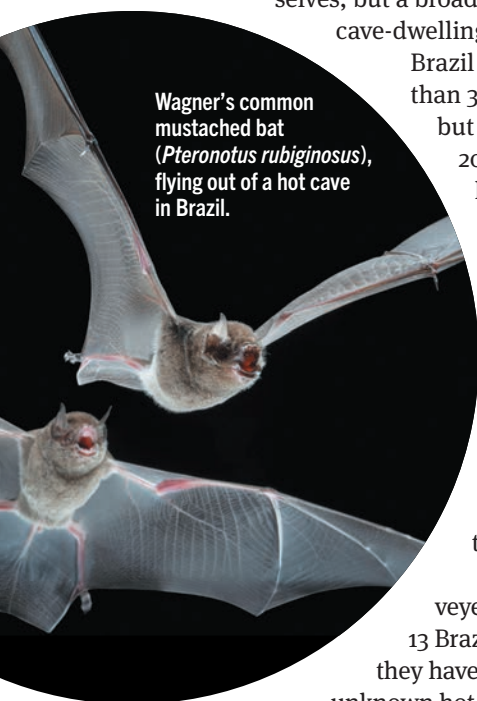
the first hot caves ever documented in that biome. The discoveries also represent the first confirmed hot caves for the states of Amapá, Alagoas, Bahia, Goiás, Tocantins, and Mato Grosso.

The researchers aren't just looking for the caves; they're also counting bat populations. To determine colony sizes, they film bats emerging from the caves and analyze the footage with specialized software that counts bats exiting and entering,



BCI's Brazil Program manager Jennifer Barros, Ph.D. (far right), with partners from the NGO SOS Caatinga and Narjara Pimentel, a Ph.D. candidate studying hot caves in Brazil, in the first hot cave confirmed for Alagoas state.

Photo: Jennifer Barros, Ph.D.



Wagner's common mustached bat (*Pteronotus rubiginosus*), flying out of a hot cave in Brazil.

producing an estimate of the total population. One newly documented cave in Amapá hosts more than 162,000 bats, while another in Tocantins supports nearly 158,000.

Hot caves are important because they can serve as maternity roosts for bat species in the Mormoopidae and Natalidae families, which include furless pups. "For the puppies to survive, they need to maintain the temperature," Barros says. But these sites face growing threats that put the bat populations at risk, such as deforestation and poorly targeted vampire bat control programs.

The biggest threat, however, is habitat degradation and destruction from nearby mining. While caves with Endangered species are fully protected by federal law, hot caves can be destroyed if companies compensate. This means they would need to protect two caves for the one destroyed, which should be equivalent in characteristics to the one being destroyed. However, this is generally not possible.

"It is just impossible to find another two caves with the same characteristics, number of bats, and all the species," Barros says. "You cannot compensate. If you destroy a hot cave with thousands and thousands of bats, you will not find another one in the same way."

BCI's next steps include long-term monitoring of the newly discovered caves, community outreach, and efforts to establish protected areas around key sites. By helping local communities understand that these insect-eating bats consume vast quantities of agricultural pests, Barros hopes to build support for conservation.

"These caves are crucial," she says. "Not only for these bats, and the other cave-dwelling species, but also for people, too."

 Hot caves can reach up to 104 degrees Fahrenheit with nearly 100% humidity.

"If you destroy a hot cave with thousands and thousands of bats, you will not find another one in the same way." —JENNIFER BARROS, PH.D.

Teaming Up to Protect Bats

Training prepares 20 wildlife professionals to monitor bats in New Mexico

By Jessie Bunkley

Collaboration is critical for an effective response to such a widespread threat, and as part of this effort, BCI scientists trained Forest Service staff and partners on proper bat capture and handling techniques so they can continue monitoring.

The wide beam of my spotlight illuminates a small, furry creature suspended in mid-air. The bat is caught in a fine net stretched over Gallinas Creek in the Sangre de Cristo mountains in northern New Mexico. As one of BCI's biologists and trainers on the project, I guide a fellow scientist through the process of untangling the bat. First, we identify which side of the net it entered from. Then, we slowly work the fine strands off the bat's back and over its elbows, wrists, and head.

It's 8 p.m., and our work is just beginning. We are surrounded by the soothing sounds of the creek, the brilliance of the night sky, and great bat habitat. Looming in the distance is the bare-rock face of Hermit's Peak, and a ponderosa pine forest surrounds us. Some trees are green while others are charred. This canyon was caught in the confluence of the Hermit's Peak and Calf Canyon fires, which together in the spring of 2022 burned 340,000 acres, making it the largest recorded wildfire in New Mexico's history.

To aid the recovery process, BCI is partnering with the U.S. Forest Service to restore damaged infrastructure and fencing in the Santa Fe National Forest, ensuring wildlife have access to water.

In addition to restoring this critical habitat, the Forest Service wants to learn about the bats' health, specifically whether white-nose syndrome (WNS) is present.

Bats infected with WNS tend to rouse during hibernation, burning precious fat reserves in the process. If this happens repeatedly, a bat can starve to death. The disease has steadily progressed westward, and in 2023, the fungus was first detected in New Mexico.

Monitoring for the pathogen on the landscape requires scientists to capture bats and swab their wings and noses. The swabs are then analyzed for the fungus's DNA. Collaboration is critical for an effective response to such a widespread threat, and as part of this effort, BCI scientists trained Forest Service staff and partners on proper bat capture and handling techniques so they can continue monitoring. During this training, which took place over two weeks in April and May 2026, 20 wildlife professionals from six agencies learned to net, handle, and swab bats.

Capturing bats along Gallinas Creek is part of this effort. After carefully extricating the bat from the net, we take it to our tabletop lab, where we swab its nose and a forearm, take numerous anatomical measurements, and evaluate its health. Other biologists gather around, watching and learning. Together, we work our way through a key to determine the species: long-legged myotis (*Myotis volans*).

Soon, the bat is ready to return to the skies. This is everyone's favorite moment: seeing the bat fly back to its wild home and disappear into the darkness of night. 🦇

Biologists from BCI, U.S. Forest Service, Bureau of Land Management, and New Mexico Game and Fish prepare to capture bats in Gallinas Canyon in the Santa Fe National Forest.

Photo: Rachel Harper



A long-legged myotis (*Myotis volans*) prepares to fly.



Photo: Jessie Bunkley

A Win for People and Bats

Gila National Forest project protects important cave site

By Paul Hormick

This spring, BCI coordinated with the U.S. Forest Service and Tribal Nations to install bat gates for a cave in New Mexico's Gila National Forest. The gates, which were built and installed by MineGates Environmental, now protect Pleistocene relics, Native American pictographs, and bats.

The cave branches through hundreds of feet of subterranean habitat, with multiple openings above ground. BCI's Senior Habitat Restoration Specialist Dan Taylor says protecting such a cave is important for bats.

"The more complex a cave, the better, because these caves have habitats with different microclimates that bats can take

advantage of," Taylor says. "Some parts of a cave may be cooler, therefore better for hibernation. Others are much warmer and better for birthing and raising pups. This cave, with its complex structure and multiple openings, is such a cave."

Taylor explains the surrounding environment is also ideal for bats, with old trees, cliffs, and reliable water supplies. "These essential habitat components are all right there, close to the cave," he says. "If you're a bat, it's better if you don't have far to go to drink or forage."

However, the cave is also close to a Forest Service road and easily disturbed by humans. In 2009, Christopher Adams, an archaeologist with the Forest Service, saw the need for gates, but the original idea was to protect cultural relics. "I wanted to protect the cave because people were going in there with spray paint. I was trying to protect Apache pictographs," he says.

During the course of the project, BCI and the Forest Service consulted with six tribal governments about protecting the images, which date from 1650 to 1880. "All were in support,"

Adams says. Besides the pictographs, the cave also harbors Pleistocene fossils of pocket gophers, wood rats, and even extinct species, such as the dire wolf.

With funding from the Gila National Forest, the partners worked to install five gates, one at each entryway. The gates are designed to allow bats to enter and exit, while excluding humans. Made of iron, the gates will rust and are intended to blend in with the cave and the natural surroundings. The Forest Service also installed a fence around the cave and now controls access to the area.

During surveys at the site, the team discovered that javelina—which are wild, pig-like ungulates—frequently used the site, so the gates were placed a bit inside the cave to ensure that javelinas could continue to access the cave's shade and protection from the elements.

Additionally, BCI performed a survey of the cave last summer to learn more about the bats that live there. DNA sequencing of guano samples collected by the surveyors identified up to four species in the cave, including the long-legged myotis (*Myotis volans*) and big brown bat (*Eptesicus fuscus*), as well as two species which are difficult to genetically distinguish from each other: long-eared myotis (*Myotis evotis*) and fringed myotis (*Myotis thysanodes*). Either or both of the species could be present. The survey also turned up insect parts on the cave floor, indicating bats use the cave as a day roost and a night roost for feeding.

The bat gates work to protect this important site, including as habitat for bats.

"Complex caves like this are not that common," Taylor says. "This project is a big win for bats." 🦇

"Complex caves like this are not that common. This project is a big win for bats."

—DAN TAYLOR

Protecting the cave entrance will protect bats, Pleistocene relics, and Native American pictographs.



Photo: MineGates

Ancient Bats

50,000-year-old bats found
in Grand Canyon cave

By Shawn Thomas

Every year, millions of visitors gaze upon the famous vistas of Grand Canyon National Park, but few see its hidden inner world of caves. A small number of dedicated cave researchers have been quietly exploring and documenting this underground world and recently made an unusual discovery: thousands of desiccated bats, scattered along miles of a cave's passageways.

The cave served as nature's perfect museum, with the dry, stable environment preserving the animals after they died of natural causes. Since the discovery, researchers evaluated some specimens' ages through radiocarbon dating and found the bats are thousands of years old. Some specimens even exceeded the upper limit of radiocarbon dating, meaning they are more than 50,000 years old.

These initial results demonstrate that bats have continuously occupied the cave system for millennia, illustrating the importance of caves, which serve as habitat anchors through changing climate eras.

A myotis bat among gypsum flowers.



Pallid bat (*Antrozous pallidus*) on the cave floor.

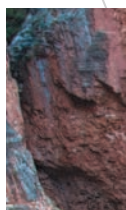
Photo: Shawn Thomas

Photo: Shawn Thomas



Inside the cave.

Photo: Stephen Eginore



A caver rappelling to reach the cave entrance.

Photo: Stephen Eginore



A typical passage inside the cave.

Photo: Stephen Eginore

A New Hope in the Fight Against White-Nose Syndrome

Tina Cheng, Ph.D., is BCI's Director of White-Nose Syndrome Research.



Photo: Fran Hutchins

BCI's Director of White-Nose Syndrome Research discusses promising vaccine developments

By Stefanie Waldek

Tina Cheng, Ph.D., BCI's Director of White-Nose Syndrome (WNS) Research, collaborates with scientists, wildlife managers, and policy makers across North America to better understand WNS and develop tools to combat it. Among the most promising tools is a groundbreaking fungal vaccine developed by researchers at the U.S. Geological Survey (USGS) that has been shown to reduce disease severity and increase survival in vaccinated bats.

What is WNS, and why is it such a threat to bats?

WNS is a disease caused by an invasive fungal pathogen, *Pseudogymnoascus destructans* (*Pd*). *Pd* is believed to have been introduced to North America in the mid-2000s, likely from Eurasia, where it is endemic. There are a dozen bat species that have contracted WNS in North America, but three species have been particularly hard hit: the little brown bat (*Myotis lucifugus*), tricolored bat (*Perimyotis subflavus*), and northern long-eared bat (*Myotis septentrionalis*).

These species have suffered a greater than 90% decline on average where WNS has come through. In some cases, as with the northern long-eared bat, it's near 100%. With the disease continuing to spread each year in western North America and south into Mexico, more species are being impacted by the disease. The fungus invades bats' skin during winter, disrupting hibernation and causing bats to arouse more frequently. Advanced infections cause bats to rouse more frequently during hibernation, an energy-expensive process that causes bats to run out of fat reserves, and ultimately, perish. We have lost millions of bats to WNS. Without intervention, countless others will die as the disease continues to spread.

What are the latest developments in WNS vaccine research?

The Bat Fungal Disease Immunogen (BFDi) is a vaccine developed by USGS that elicits a protective immune response against *Pd* infection. In lab and field trials, the vaccine leads to reduced WNS disease severity and higher survival in infected bats. As the first vaccine ever developed for a fungal pathogen, BFDi is not just a big breakthrough for fighting WNS, but also for medical science.

The effort is now moving toward whole-colony vaccinations, particularly in regions where WNS is still invading. It is a race against time, but delivery of the BFDi vaccine has huge potential to slow the spread of WNS and stem mortality.

What can readers do to help?

A great place to start to get involved in bat conservation is with BCI's Bat Gardens and Bat Ambassadors programs. Financial donations are also critical. The main challenge in fighting WNS used to be finding a solution. Now, we finally have a solution but during a time when funding for conservation has become incredibly challenging.

What's exciting is that we, as a community, can work together to make this happen and instead of seeing bats disappear in front of our eyes, we can secure their spot in the night sky. 🦇



A Chiricahua leopard frog (*Rana chiricahuensis*).



Photo: George Andrejko

Unlikely Allies

Conserving habitat benefits bats, frogs, other species

By Lindsay Lee Wallace

Scientists and conservation partners in the southwestern U.S. are working to forge an alliance between two unlikely creatures: bats and frogs.

The region supports the greatest diversity of bat species in the country, including species like the Mexican free-tailed bat (*Tadarida brasiliensis*), spotted bat (*Euderma maculatum*), pallid bat (*Antrozous pallidus*), and many others. It's also the home of other unique animals, including the Chiricahua leopard frog (*Rana chiricahuensis*), which is classified as a Threatened species.

The Chiricahua leopard frog population faces a number of threats, including predation by invasive bullfrogs and mortality from a fungus-caused disease known as chytridiomycosis that has killed significant proportions of many amphibian species worldwide.

Where do bats and frogs come together?

According to Dan Taylor, BCI's Senior Restoration Specialist, the most limiting factor for bats in this region is access to water. Not only do the various bat species that live in or visit the area need the water to drink, they also forage in the ecologically rich riparian zones that often surround bodies of water. Plentiful water sources are also essential to the survival of the Chiricahua leopard frog.

But over the last 100 years, the availability of naturally occurring sources of surface water like ponds, streams, and springs has greatly diminished. Taylor says this is due to agriculture, groundwater pumping, and a changing climate.

When bats want to drink water, they don't stop flying.

Instead, they dip low over a body of water and sip on the go. Even smaller bat species need a body of water that's at least eight feet long, and larger species need up to 40 feet to perform this essential aerial maneuver.

Taylor and his team with BCI's Habitat Protection and Restoration Program work to help the ecosystems that bats call home survive and thrive. A key part of this effort is restoring existing water sources. The team also works to create new water sources, like tanks and troughs that provide water for both wildlife and livestock.

Since natural water sources are disappearing, the remaining waters attract high numbers of bats and frogs.

"Because of the extent of natural habitat loss, these livestock ponds serve as critical water sources that are absolutely essential for maintaining bat and frog populations," Taylor says.

"Because of the extent of natural habitat loss, these livestock ponds serve as critical water sources that are absolutely essential for maintaining bat and frog populations."

—DAN TAYLOR

Photo: Cody Masley



Chiricahua leopard frogs being released from Phoenix Zoo.

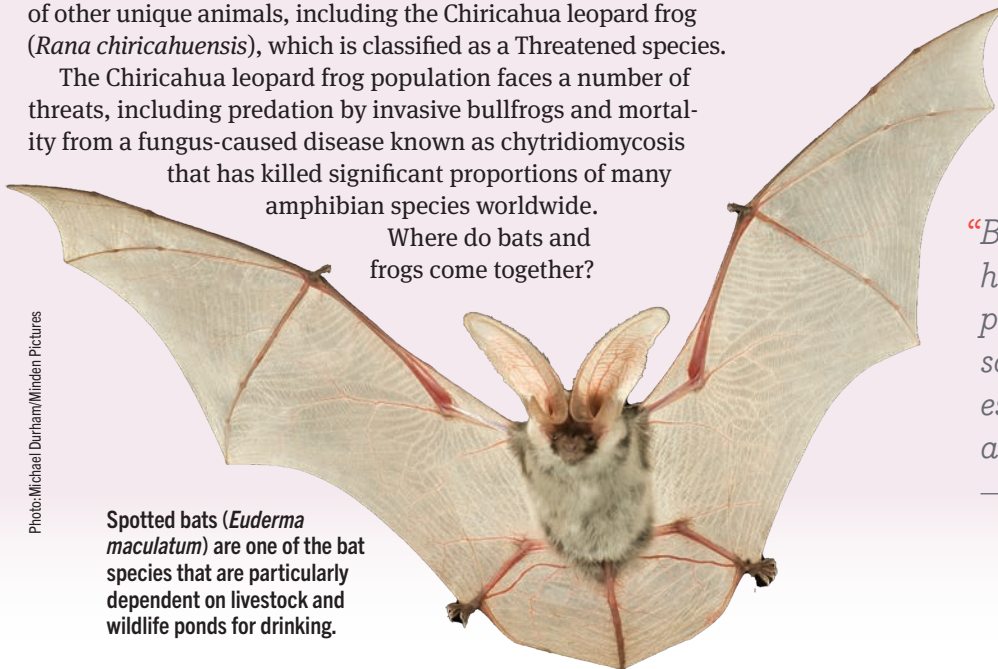


Photo: Michael Durham/Minden Pictures

Spotted bats (*Euderma maculatum*) are one of the bat species that are particularly dependent on livestock and wildlife ponds for drinking.

Batty Gifts for Everyone on Your List

Skip the ordinary this year and give a gift with purpose. When you shop with BCI, you're giving more than a present—you're helping protect bats worldwide.

Whether you're shopping for a dedicated bat fan, a curious nature lover, or that hard-to-buy-for friend, BCI's online store is full of unique gifts that celebrate bats and support their conservation.

Choose from gift memberships, apparel, home goods, plush bats, and more. Every purchase supports the science, conservation, and community partnerships that are creating a future where bats can thrive. Start your holiday shopping early and make every gift count.



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