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FEATURES

- 1** **Working Together**
BCI builds success with the U.S. Forest Service
by Robert Locke

- 6** **Helping Nature**
provide hollow trees for forest bats
by David Richardson

- 9** **Bats, Kangaroos and Glow Worms**
Founder's Circle Ecotour to Australia & New Zealand

- 12** **Protecting Mexico's Corn**
Bats help keep the pests at bay
by Leonardo J. López-Damián

NEWS & NOTES

- 14** **Bat Blitzin' in the South**
Bat houses for Norway
Sign up for a 2008 Workshop
Member Nights at Bracken Cave
BCI member snapshots
The Wish List

COVER PHOTO: A column of Mexican free-tailed bats sails over the Texas landscape in search of flying insects. This species preys on moths that cause enormous damage to Mexico's vital corn crop, as well as to Texas' cotton. (See page 12.)

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WORKING TOGETHER

BCI BUILDS SUCCESS WITH THE U.S. FOREST SERVICE

by Robert Locke

When Unimin Corporation learned in 1995 that about 100 bats were hibernating just inside the crumbling entrance to an old silica mine that was soon to be sealed, the mining firm contacted U.S. Forest Service geologist Tudi Smith for advice. Smith called Bat Conservation International. So did Susan Armentrout, Unimin Senior Environmental Specialist. The result of those calls was an exceptionally productive partnership that is still paying off for the endangered Indiana myotis (*Myotis sodalis*).

Dan Taylor, BCI's Bats & Mines Coordinator at the time, discussed the abandoned Magazine Mine with both women, then all three visited the Illinois mine to assess its importance. Conditions seemed near ideal for Indiana myotis, Taylor recalls, and some of the endangered bats were identified.

The partnership, which also included the Illinois Department of Natural Resources and U.S. Fish and Wildlife Service, stabilized the main entrance and installed a bat-friendly gate. When a second collapsing entrance threatened to disrupt desirable airflow, the partners stabilized and fenced it. Thanks to those and other efforts, the number of hibernating Indiana myotis – a species in alarming decline for decades – increased at the mine from a few hundred to 43,500 by 2007.

Magazine Mine is considered a model of effective conservation collaboration, and Unimin's commitment to this important hibernation site has earned the company several major conservation awards.

Siebert Crowley (right) of Unimin Corp., Ray Smith of the U.S. Forest Service and BCI's Sheryl Ducummon (far left) examine the gated entrance at Magazine Mine.

The tables turned a few years later, when BCI needed help with another Indiana myotis site, this one in Virginia. In 1999, BCI Founder Merlin Tuttle was frustrated after years of trying to permanently protect Rocky Hollow Cave. Once – before frequent human disturbances – the cave had sheltered a hibernating Indiana myotis population estimated at a million or more bats. The logjam was finally broken by Forest Service biologist Lisa Nutt, an enthusiastic graduate of a BCI Bat Conservation and Management Workshop.

Nutt led the way through a complex maze of ownership and jurisdictional issues to win long-term protection for this potentially vital cave. A partnership engineered by Nutt and BCI brought tons of material to the mountaintop site by helicopter and built a 25-foot (7.6-meter) gate in three days with mostly volunteer labor. The site was given special protection as a “Significant Cave” by the Virginia Cave Board.

BCI and the Forest Service have been working together, formally and informally, to protect and study bats and their habitats for years. We have collaborated on bat-friendly gates at mines and caves, experimented with artificial roosts, conducted a remarkable variety of bat research, produced publications, co-sponsored symposia and partnered on such programs as Water for Wildlife and Bats and Wind Energy. A Memorandum of Understanding, inaugurated in 1994, commits BCI and the agency to work cooperatively in bat conservation and research.

“The Forest Service has demonstrated a deep and abiding



Heather Green (left) of the U.S. Forest Service, BCI Founder Merlin Tuttle and Tom Morrell of Arizona Game and Fish record data about a captured bat. A major collaborative effort in 1994 documented habitat needs of forest bats in Arizona. This unprecedented project that yielded many surprises.

commitment to bat conservation,” Tuttle said. “We at BCI are proud of our long alliance with this dynamic agency and extremely pleased that our relationship is expanding in new directions. I’m delighted to see that, together, we are accomplishing more for bats each year.”

Forest Service initiatives are expanding worldwide through its International Programs section, which is funding up to 10 special BCI Student Research Scholarships a year. These Bats

Partners

Here is a partial list of recent collaborations between the U.S. Forest Service and Bat Conservation International (often also with other partners):

Forest Bat Radiotracking Project (1994): The first-ever systematic study to document roosting preferences of Arizona forest bats. Aircraft helped track radiotagged bats on the Coconino National Forest, revealing previously unknown roosting preferences that are crucial for conservation.

Magazine Mine (1996-present): A bat-friendly gate and other efforts in Illinois allowed a declining population of endangered Indiana myotis to increase dramatically.

Bats of Eastern Woodlands (1999-2000): This publication reviewed existing knowledge of eastern forest bats and evaluated land-management practices on the bats and their habitats. It was widely distributed by the Forest Service.

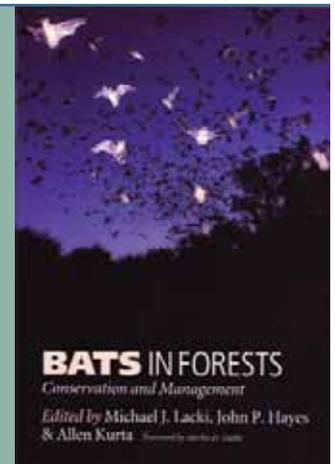
Kiggins Mine Protection (1999-2000): Three gates permanently protect a hibernation site for Townsend’s big-eared bats at Kiggins Mine in Oregon, where vandalism had caused

a nearly 60 percent decline in bat numbers.

Spotted Bat Foraging and Roosting Ecology Study (1999-2005): Spotted bats were radiotracked to roost sites in the Grand Canyon, House Rock Valley and the Kaibab Plateau in Arizona. An enormous collaborative effort tracked foraging movements from the air and ground.

Forest Bat Artificial Roost Project (2000-2002): Federal and state agencies, timber interests and community groups worked with BCI’s Artificial Roost Project to develop and test artificial roosts for forest bats in Minnesota, Oregon and South Carolina with the goal of developing a model for use in timberlands.

Forest Bat Conservation and Management Workshops (2002-2004): Two-day workshops on forest-bat conservation and management were conducted by BCI’s Forest Bats



in International Forestry Scholarships, designated for conservation-relevant research in developing countries, enables us to increase the overall number of BCI scholarships – from a total of 13 in 2005 to 21 in 2007 – and to double the maximum award to \$5,000.

In the past two years, Bats in International Forestry Scholarships supported 21 students working in Argentina, Brazil, Colombia, French Guiana, Kenya, Madagascar, Malaysia, Mexico, Panama, Peru, the Philippines and Thailand. (For an example, see “Protecting Mexico’s Corn,” page 12.) This research contributes greatly to scientific knowledge, but the greater impact likely will be the young biologists whose skills and careers benefit from the support and recognition.

The scholarships, as well as collaboration for a 2009 BCI bat-conservation workshop in Nicaragua, are part of the International Programs’ Wings Across the Americas effort, which covers migratory birds, butterflies and bats. It is overseen by biologist Carol Lively, who describes herself as a joint-venture guru. “Our philosophy is that conservation is a long-term process, and it takes a big network of people to really make it happen on the ground. Capacity building [as by encouraging research and nurturing young scientists] is one of the most valuable activities I can be involved in.”

About 30,000 Forest Service employees manage 193 million acres (78 million hectares) of land divided into 155 national forests and 20 grasslands that contain an incredible variety of habitats and wildlife. Its scientists and forest managers, on their own and in collaboration with other agencies, industries and organizations, con-

duct wide-ranging research and conservation projects.

Bats are very much a part of those efforts, and BCI, especially through its hands-on workshops, has helped prepare many Forest Service staffers to work with bats – and to convince more than a few to focus their attention on bats. Smith said her work at Magazine and many other mines over the years “pretty much all grew out of that [bats and mines] work-



U.S. Forest Service scientists Ted Weller (left) and Sybill Amelon examine their equipment at a BCI Acoustic Monitoring Workshop in Pennsylvania. Both are frequent instructors at these popular field workshops.

MERLIN D. TUTTLE, BCI

Initiative, with funding, instructors and other support from the Forest Service. More than 175 foresters and biologists, many from the Forest Service, received the training.

Bats & Forest Symposium (2004): Symposium at Hot Springs, Arkansas, presented invited papers on bat conservation and research and forest management, plus a field trip to the Ouachita National Forest. Sponsors included BCI and the Forest Service Southern Research Station.

Region 6 Cave Protection Collaboration (2004-2006): Gates were installed to protect bats in seven caves on or near national forests in the Pacific Northwest.

Water for Wildlife (2004-present): BCI’s Water for Wildlife project works with Forest Service biologists through much of the American West to improve bats’ safe access to livestock watering tanks and other artificial water sources. The Forest Service has hosted workshops and is distributing 3,000 copies of the *Water for Wildlife Handbook*.

Region 1 Inventory & Monitoring (2005-2007): The first

comprehensive bat inventory and monitoring program on national forests in Idaho, Montana, and the Dakotas, using a modified version of the “bat grid” developed in Oregon.

Bats in International Forestry Scholarships (2005-present): Forest Service support permits BCI to award up to 10 additional BCI Student Research Scholarships a year for conservation-relevant research in developing countries.

Long-term Acoustic Monitoring Stations (2007-2008): Three monitoring stations, on national forests in Idaho and Montana, use solar-powered bat detectors and tie-ins with weather stations to record bat calls and weather data nightly, year-round. Information gathered includes species occurrence, activity patterns, habitat use and relationships to weather patterns.

Bats in Forests: Conservation and Management (2007): The most comprehensive scientific book ever on forest bat conservation and management, published by Johns Hopkins University Press, is based on the proceedings of the 2004 Bats & Forest Symposium in Arkansas.

shop” that she attended in Idaho. For Nutt, attending a workshop “literally opened the door to a now 13-year-long love of all things bats and was the beginning of meeting all the great folks I’ve worked with at BCI.”

“I love bats, I really can’t get enough of them,” says BCI Member David Saugey, Wildlife Biologist at the Ouachita National Forest in Arkansas. “BCI had a real impact on me. I read the magazine and enjoy seeing how big bats are becoming (as an important conservation issue) all over the world.”

Saugey, who was among researchers who discovered red bats hibernating unexpectedly in leaf litter on the forest floor, also takes to heart the Forest Service’s commitment to public education and outreach. “I’ve presented more than 800 school programs since 1990. The kids are little sponges. They’re so interested in this kind of stuff. There seems to be a disconnect between children and nature these days, so we have to take it to them.”

Terri Marceron attended one of the first BCI workshops, hosted by biologist Brock Fenton in Ontario, Canada, in 1989, when she was an assistant district ranger in Montana. After the workshop, bats became the prime focus of her community and school education efforts. She designed a traveling bat-education program that the Forest Service used throughout the region, was part of a Forest Service speakers’ circuit and gave many bat-oriented talks to Forest Service staff.

Marceron is now the Forest Supervisor for the Lake Tahoe Basin Management Unit in California and Nevada and says she rarely has time these days for bat presentations, but “I continue to keep my pulse on bats.”

More than 200 Forest Service staffers have participated in various BCI workshops, including several co-sponsored by the Forest Service.

“BCI workshops are the best thing out there for getting the word out, not only for appreciating bats but for working with them,” says Jerry Trout, the Arizona-based National Coordinator for Cave Resources. Trout, who attended a 1995 workshop to hone his species-identification skills, provides printing of course materials used at BCI workshops. He highly recommends the workshops, partly for the passion that usually results: “They take that enthusiasm home with them and it can be infectious.”

After 35 years with the Forest Service, Trout also notes some “tremendous changes” regarding bats. After re-establishing a system of 10 regional cave and mine coordinators, he said, “Four of those ten coordinators are wildlife biologists. Their expertise is not in caves, but in bats. Four out of ten! That’s amazing.”

Forest Service Region 6 Bat Specialist Pat Ormsbee of Oregon has been working since 2002 on the powerful concept of a “Bat Grid” – a standardized bat inventory and monitor-



COURTESY OF PAT ORMSBEE

Field crews set mist nets in a beaver pond as part of Forest Service Bat Specialist Pat Ormsbee’s innovative “Bat Grid” program to standardize the collection of bat inventory and monitoring data in the Northwest.

ing program with centralized data collection throughout the Pacific Northwest. Her collaborators include Joe Szewczak of Humboldt State University and Jan Zinck of Portland State University, with Aimee Hart of the Willamette National Forest as the Field Team Lead. BCI contributed through a North American Bat Conservation Fund grant. The system to improve regional information gathering should serve as a model for use in other areas.

Ormsbee credits much of the Grid's success to the 35 to 40 people who collect data each year, after standardized training. "We love it when people show up at our training sessions after they've been through a BCI workshop. They're really pumped up and ready to go."

Wildlife Biologist Sybill Amelon, a prolific scientist at the Forest Service's Northern Research Station in Missouri, attended a 1995 workshop and is now an instructor at many of them. She says the intense sessions "cover all the basics to get you going [in bat management and research] and there's no other place where you can get that much in such a condensed, focused package."

She encountered BCI very early in her career, "when I went to a [Forest Service] Watchable Wildlife program and Merlin Tuttle was the keynote speaker. That was a real turning point for me. It made a big difference in the decisions that I made." Amelon later earned a Ph.D. with a speciality in bat ecology and now works fulltime as a Forest Service bat researcher.

Ecologist Ted Weller of the Forest Service's Redwood Sciences Laboratory in California is a frequent instructor at BCI's Acoustic Monitoring Workshops. "It's a great service," he says. "It's a chance for folks, especially agency biologists, to live bats for a week, to just think about them all the time. Some of these people, they leave the workshops and then you come across them in the scientific literature a few years later. That training really pays off."

A particularly innovative BCI-Forest Service collaboration emerged from a 1995 workshop. Biologists Melissa Siders and Dan Garcia de la Cadena of the North Kaibab Forest Ranger District in Arizona learned during the session that, while some bats roost under the peeling bark of dying trees or snags, such snags were fast disappearing from managed forests.

Garcia came up with the idea of making artificial bark and mounting it on healthy trees to increase roosting options. Tuttle, who was leading the workshop, "was very excited and supportive of the idea," Siders recalls. She and Garcia spent several years developing the idea, sampling roost temperatures, arranging production of unobtrusive artificial bark and testing the system. It worked in Arizona and has been modified for use elsewhere.

Siders, who moved from the Forest Service to the Bureau of Land Management a few years ago, said the workshop refocused her career onto bats since "I didn't know hardly anything about bats before that." During her 12 years at the Forest Service, she used BCI materials and photos to build "bat-education boxes" that were distributed throughout the region. "We also did a lot of (bat) research projects at North Kaibab (especially in identifying unexpected roosting and foraging areas), and we got funding from BCI for some of them."

Weller figures that despite great research progress, count-

less questions remain. "There really is a lot of opportunity, especially for new grad students, to make a real contribution right away," he says. "That's why I got into this." Weller discovered in 2001 that fringed myotis (*Myotis thysanodes*) actually roost in large snags (dead trees), rather than exclusively in caves, mines and buildings.

"You never really know what's going to come up next. Problems with wind energy caught us completely unprepared." Weller is now active with the BCI-led Bats and Wind Energy Cooperative in seeking solutions to the alarming rate of bat fatalities at wind-energy facilities.

So is Dennis Krusac, Endangered Species Specialist for the Forest Service Southern Region. Krusac signed on after seeing BCI's documented research on bat kills at a West Virginia wind farm. "Wind energy is coming to federal lands, so I figured the Forest Service should be involved early on because we have the potential to be a huge player. I am optimistic that we can learn how to develop wind energy and minimize the effects on bats."

Krusac, another BCI workshop graduate, says his career tilted toward bats in the mid-1990s, when the Forest Service faced litigation over timber sales in habitat used by the endangered Indiana myotis. "Working with field biologists and partners, we developed proactive conservation measures for bats. Now when we get sued, we usually prevail because we are using the best available science to design our conservation measures."

Krusac also stresses the outreach and education aspect of Forest Service work: "We view it as part of how we can get the conservation message ingrained into society. People are bombarded with all these old myths about bats, but if you take the time to teach them, they realize, 'Hey, bats are really pretty darn cool.'"

Amelon cites a striking jump in scientific interest about bats, at the Forest Service and almost everywhere else, since the early to mid 1990s. "Fifteen years ago, there literally were just a handful of bat researchers. Now, when you go to a NASBR [North American Symposium on Bat Research] meeting, the place is just full to overflowing.

"I know there were other things that were going on, but I think BCI is strongly behind that" increased attention to bats.

ROBERT LOCKE is Director of Publications at BCI.



BRIAN KEELEY, BCI / 9154312

A Forest Service worker installs artificial bark on a tree at the Kaibab National Forest in Arizona to provide roosts for forest bats.

HELPING NATURE

provide hollow trees for forest bats

by David Richardson

Rafinesque's big-eared bats share a roost with several southeastern myotis in a large cavity inside a tree on a Mississippi bottomland forest.

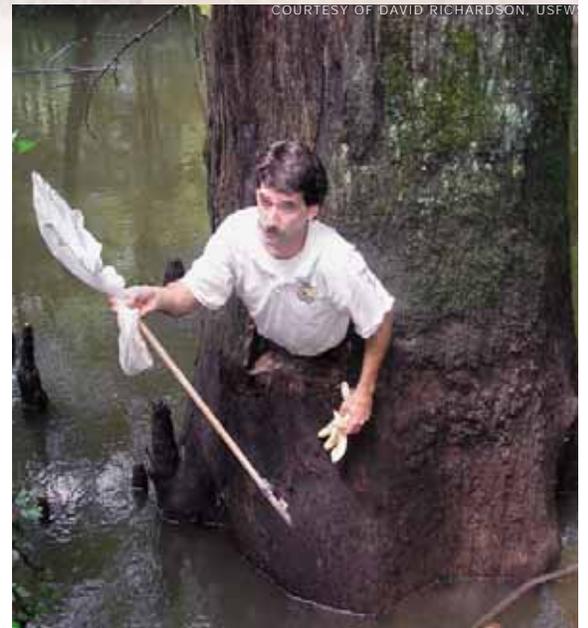
COURTESY OF DAVID RICHARDSON, USFWS

Searching for bats in hollow trees of bottomland hardwood forests can be a nerve-racking experience. Most tree cavities are so narrow that you lie on your back on the often-soggy ground and squeeze your head and one hand holding a flashlight into a ragged little opening. You never really know what lurks in the dark interior of that tree. If you're very unlucky, a venomous copperhead or water moccasin snake might be stretched amidst the twigs and wood dust. Usually, though, the hollow is alive with mosquitoes or camel crickets that drop bits of debris on your face as they skitter about. A panicky wood rat may scamper across your chest as it flees.

There's no room to jerk back in fright, so you hold your ground and maneuver the flashlight until you can scan the walls and ceiling of the chamber. Those reflective eyes you immediately notice high above are not those of bats but of large wolf spiders. If it's a good day and you keep looking, however, you might just spot a Rafinesque's big-eared bat (*Corynorhinus rafinesquii*) clinging to the cavity wall 15 feet (4.5 meters) overhead.

The work is less disconcerting when old trees offer hollows big enough to crawl into and stand upright during the search. But such trees are, unfortunately, becoming increasingly rare in American forests.

As a wildlife biologist with the U.S. Fish and Wildlife Service, I'm exploring the native habitat of Rafinesque's big-eared bats, studying the natural hollows within bottomland hardwood trees. I am working with graduate student Candy



Wildlife biologist David Richardson emerges from inside a hollow tree that he was examining for use by big-eared bats.

Stevenson and Professor Jeanne Jones of Mississippi State University's College of Forest Resources, with support from Bat Conservation International, the U.S. Fish and Wildlife Service, U.S. Geological Survey and Mississippi State University. We are documenting the relative abundance of tree cavities and their use by big-eared bats within mature bottomland forests. Our goal is to develop forest-management recommendations to conserve these bats. The availability of appropriate hollow trees is critical.

One unanticipated result of our fieldwork is a promising – and virtually free – strategy for increasing the number of natural hollow-tree roosts for Rafinesque's big-eared bats. In trying to simplify our monitoring efforts, we discovered a way to give bats access to previously closed tree cavities: We simply add an entrance.

Big-eared bats' extensive use of human-made structures, such as bridges and dilapidated barns and abandoned houses, is well documented, but few researchers have examined big-eared bats' natural roosts – which have been disappearing at an alarming rate. Most of the research attention has been aimed at cavities in water tupelo and bald cypress trees of southern swamps and brakes. The hardwood bottomland forests present a very different ecosystem.

For several years, we have been repeatedly inspecting a sample of approximately 650 randomly located hollow trees across the bottomland hardwood forest at the 48,000-acre (19,400-hectare) Noxubee National Wildlife Refuge in east-central Mississippi. Each cavity has been inspected at least eight times over two years. An estimate of cavity density, relative age of the

tree, its use by bats and other characteristics are being collected to help us understand the types of cavity trees these bats are selecting and how they utilize the trees across the seasons.

On the best of days, we might encounter several trees with bats, mostly single bats – presumably males, which tend to roost alone or in small groups. Other trees may hold a colony of southeastern myotis (*Myotis austroriparius*), which is also dependent on hollow trees for natural roosts. The chittering of these smaller bats can be readily heard within the trees, where they consistently cling to the ceiling. We often find both species using the same tree at the same time, and even, on rare occasions, roosting together in a single cluster. Sometimes an eastern pipistrelle (*Perimyotis subflavus*) will be perched near the entrance while the big-eared bats roost farther up inside the hollow.

Of those 650 cavity trees in our study, only 80 have been observed with bats. We undoubtedly failed to detect some bats, but additional visits to the same trees ultimately will give us a better estimate of use. The roost requirements of Rafinesque's big-eared bats are still being determined. Very old, very large hollow trees are clearly the most important for these bats, but we have documented a few big-eared bats using cavities in trees as small as 16 inches (41 centimeters) in diameter with hollows just seven feet (2.1 meters) high.

We search for potential maternity colony sites by following radiotagged female bats. We have tracked such bats to a few relict cypress trees. These ancient giants of the forested bottoms – some measuring more than 60 inches (1.5 meters) in diameter – have grown for centuries, slowly expanding in girth



PHOTOS COURTESY OF DAVID RICHARDSON, USFS

Using natural tree hollows to check for roosting bats can be a daunting experience, as the author demonstrates at left. And spotting bats clinging to the inside of cavities (such as the one at right) is often challenging.

while the heartwood decays, leaving a hollow vessel behind.

The audible beep of a transmitter clearly indicates the presence of a bat within a tree, but often the only opening, created when the top of the tree broke off, is 60 feet (18 meters) or more above the ground. Our challenge was to find a way to easily and regularly examine a cavity without having to climb the tree. Our solution was to cut a small opening, typically about 12 by 18 inches (30 x 45 centimeters), into the base of the tree. We plunged the bar of a chain saw through the four- to six-inch (10- to 15-centimeter) thick trunk wall to create a "removable window" that could be reinstalled to maintain the internal environment.

These portals give us a unique view of big-eared bat maternity colonies from the bats' perspective. Leaning through the small window at one tree, I could see perhaps 75 adult bats clinging to the interior wall of the high cavity. A few bats took wing, apparently disturbed by my intrusion, but they settled again with little hesitation. Our radiotagged informant, with colored bands on its forearm and a radio glued to its back, stood out from the others.

Beginning in early June, this and several other cypress trees along a two-mile (3.2-kilometer) stretch of creek periodically

hold mothers and pups. Throughout the pup-rearing period and into fall, the females move among these trees, changing roosts every few days for no apparent reason. This movement may be linked to where they foraged the previous evening. Or perhaps a raccoon, a rat snake or another predator ventured into the tree. It is clear that the minimal intrusion of our observations during the day is not causing the bats to leave these trees.

When temperatures begin falling around November, the bats (which do not hibernate) abandon the tree cavities they've used as summer roosts. Our searches have revealed only a few large, old cypress trees that fit Rafinesque's big-eared bats' apparent winter-roosting needs. These rare trees have very small entrances, and the temperature and humidity inside the cavities are very stable.

The number of bats that use these few trees as winter roosts is relatively small, probably about 200 or less, but this may constitute the entire big-eared bat population in hundreds or even thousands of acres of continuous bottomland. These winter-roost trees serve much the same purpose as caves, but with the arrival of spring, bats are rarely seen within them.

We stumbled upon our potential solution for helping Nature boost the number of natural-cavity roosts while searching for hollow trees that might hold maternity colonies. Loggers for many decades determined whether a hardwood was sound or hollow at the base by interpreting the sound generated by thumping the tree with an ax. In the days of the two-man crosscut saw, hollow trees were left standing. When we identified hollow trees suspected of having unseen upper entrances, we used chain saws to open portals to let us peer into the cavities, then used the cut-out chunk of wood to close the window after examining the interior.

We discovered that some of these trees had no opening at all – no way for bats to reach what otherwise seemed an attractive roost. When we encountered such trees, we simply left the portal open. Within weeks, we observed a southeastern myotis colony in a cottonwood tree and Rafinesque's big-eared bats in cypress and hickory trees with the cutouts.

This inadvertent discovery could represent a major opportunity to easily increase naturally occurring roost trees in forests where appropriate trees are rare or when entrances are too small for big-eared bats. When possible, this could prove more cost-effective than building artificial roosts made of wood or concrete.

The concept needs further research, but our initial observation that big-eared bats are finding these artificial openings and moving into the cavities is extremely promising. The prospect that simply creating access to existing tree hollows can provide long-term day roosts and perhaps even maternity sites is exciting.

DAVID RICHARDSON is a Wildlife Biologist with the U.S. Fish and Wildlife Service in Mississippi. Before he began working with bats a few years ago, he focused on restoring nesting habitat for the endangered Red-cockaded Woodpecker.

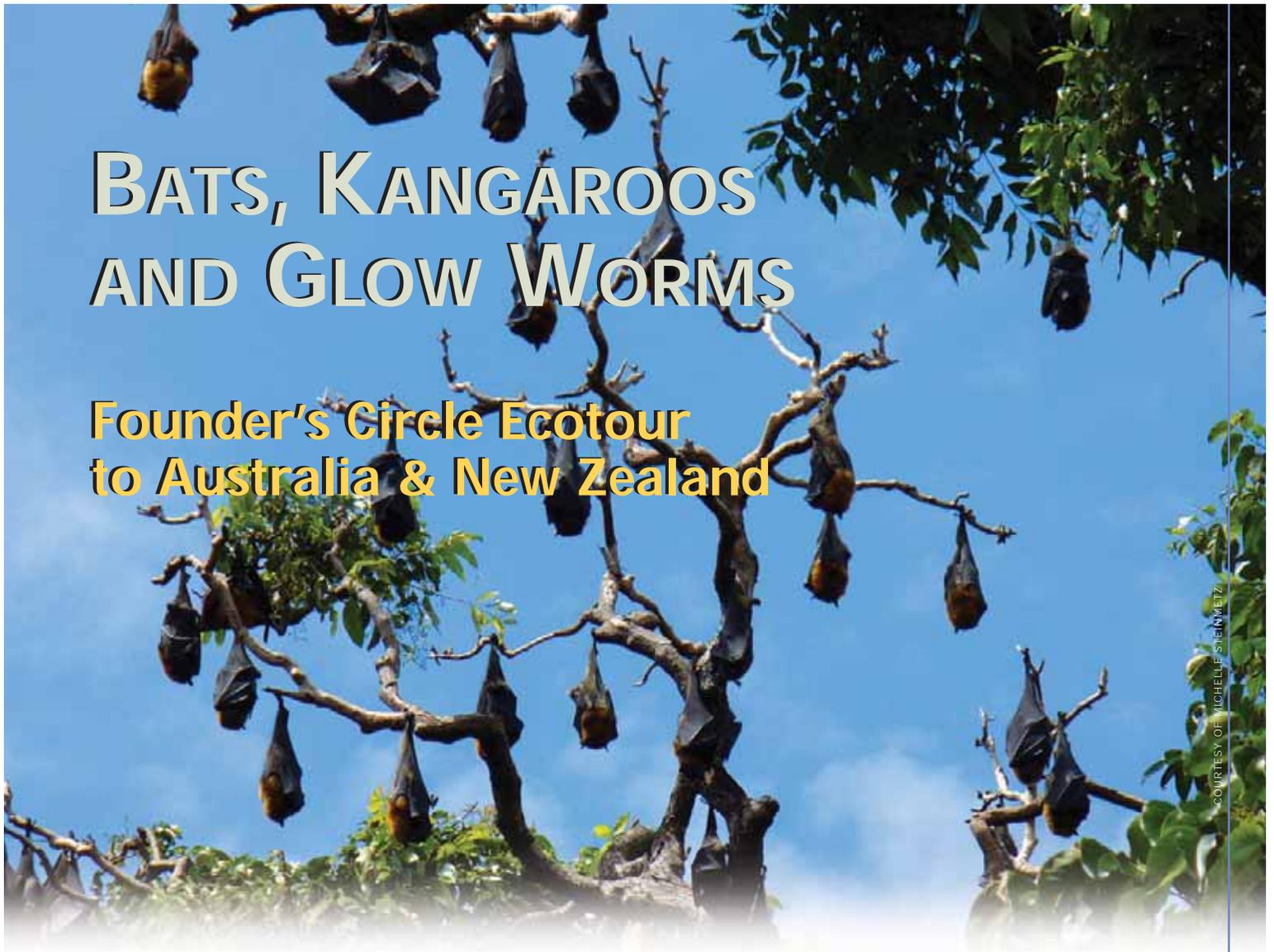


MYLEA BAYLESS, BOJ / 0043099

David Richardson and colleagues discovered that cutting artificial windows into hollow trees that have no natural openings allows Rafinesque's big-eared bats to roost inside.

BATS, KANGAROOS AND GLOW WORMS

Founder's Circle Ecotour to Australia & New Zealand



COURTESY OF MICHELLE STEINMETZ

The sight is breathtaking. Thousands of huge bats, their graceful wings spanning three feet (1 meter) or more, sail directly overhead. Waves of grey-headed flying foxes, their bodies silhouetted against the deep-purple sky, rise from the surrounding forest at dusk and fly low over the handful of BCI members gathered on a bridge across a deep gorge at Australia's Ku-ring-gai Bat Reserve.

"This," says Les Meade of Lexington, Kentucky, "is the second-best emergence of bats that I have ever seen. Number One is the emergence [of 20 million Mexican free-tailed bats] at Bracken Cave" in Texas.

And that was just the first night of BCI's 2007 Founder's Circle Ecotour of Australia and New Zealand – a 17-day expedition that featured a stunning array of habitats ranging from a tropical rainforest to a geothermal wonderland to the underwater magic of the Great Barrier Reef.

"We didn't do museums and cathedrals," said Mary Read of Milwaukee, Wisconsin. "We just always headed for the wildlife. It was wonderful and very rare."

Australia and New Zealand are rich in some of the world's most unusual wildlife – as well as at least 75 bat species, some of them unique. The travelers marveled at encounters with kangaroos, walla-



MERLIN D. TUTTLE, BCI / 0044316

Grey-headed flying foxes (*top*) roost in trees during the day at Australia's Ku-ring-gai Bat Reserve, then fill the sky in a dazzling emergence (*above*) each evening.

bies, sugar gliders, a wild assortment of possums, colorful parrots, bowerbirds and other birds, kangaroo-like pademelons, little bandicoots, even a duck-billed platypus (a rather bizarre egg-laying mammal). The focus, of course, was on the bats, including nights of netting and up-close observation, as well as visits to inspiring Australian and New Zealand conservationists dedicated to protecting them.

The Ku-ring-gai Bat Reserve is a still-wild oasis tucked into an upscale suburb of Sydney, Australia. During the day, as many as 30,000 of the grey-headed flying foxes (*Pteropus poliocephalus*) hang like Christmas ornaments from the towering trees that have survived urbanization.

The forest that shelters this flying-fox colony was about to become a subdivision in the mid-1980s. Local conservationists and scientists organized the Ku-ring-gai Bat Committee and leapt into action. BCI Founder Merlin Tuttle went to Australia two decades ago to help make the case for preservation. (Tuttle, as always, led this Founder's Circle Ecotour.) The forest and its bats were protected and the committee has been working tirelessly to protect the area ever since. Committee members described their work to the Founder's Circle visitors.

A four-day stay at Trish and Terry Wimberley's unique flying-fox rescue and rehabilitation center on Australia's Gold Coast was a special highlight for a number of the Founder's Circle members. "This was the most amazing place," said Miriam Schulman of Los Angeles. "They are first and foremost an animal hospital that cares for many, many bats, but they also take in other wildlife. They have a surgery center and a nursery for orphaned baby bats."

The baby flying foxes "are adorable. They're very affectionate. They snuggle against you and make little noises. They feel just like little kittens with wings." The tiny orphans are wrapped in swaddling blankets, which, Schulman said, "makes them feel secure since they're normally tucked up under their mother's wings and held quite tightly." They're fed with tiny baby bottles and even have "little pacifiers that Trish makes for them. These tiny creatures would melt the heart of the sternest skeptic and turn him into a bat lover."

"We enjoyed the ambience at large: the surrounding forest, with the varied animals, reptiles and birds that were cared for in the clinic with bats hanging everywhere," said Connie Kruse and Tommy Angell. They cited "the added attraction of a frog chorus one night during a lighting storm, and the ever-friendly greeters at the door: Picka and Boo (the two dogs) and a duck named Dorothy. Every day was a new experience."

The Wimberleys' property of rolling hills, forests and streams is especially rich in wildlife. "We probably saw more wildlife at their place than at any other single place we visited," Meade said. And

A Delightful Surprise

Peg Smith of Philadelphia describes her fondest memory of the Founder's Circle Ecotour of Australia and New Zealand.

My single favorite part of the trip came on the Atherton Tablelands, near Wooroonooran State Park, during a delightful detour that wasn't on the planned agenda.

Australian bat biologist and BCI Science Advisor Bruce Thomson told Merlin Tuttle that horseshoe bats were roosting in an abandoned gold mine Bruce had visited some years back. Merlin collected three of us – me, Trish Wimberley [an Australian bat rehabilitator] and George Thompson [of Virginia] – to accompany him and Bruce in finding the mine and help photograph the bats that were likely to be snoozing inside.

When we reached the entrance to property that we needed to cross en route to the cave, there were sufficient warnings and impediments to convince us we had better get permission before trespassing – a task that fell to Trish and Bruce, our Aussie BCI members. Then we ascended, squished, descended and straddled through the bush in accord with Bruce's memories of times long past. No mine in sight.

Bruce disappeared for a bit to scout his memory and finally succeeded in finding the mine. The bats were there. Trish and I trained Merlin's flashes on the first horseshoe bat he caught and he got his shot. By then, we were thirsty and hungry, so Bruce guided us to Gordonville, a square grid of a town with a green public square and a tavern on every corner. The beer was cold and the bartender sincerely friendly.

By leaving the beaten path and the day's itinerary behind, I realized an experience I never imagined would happen to this mostly armchair naturalist who reads *BATS* magazine walking to work the morning it arrives. I expect to repeat this story whenever a listener asks about my favorite part of my best journey.



MICHELLE STEINMETZ



MICHELLE STEINMETZ



MIRIAM SCHULMAN



LES MEADE



LES MEADE

the abundance of bats was impressive. “We netted across a stream under a canopy of low-growing trees,” Schulman said. “The myotis bats were hitting our net faster than we could get them out.”

The most unusual bat encountered on the trip probably was the endangered short-tailed bat (*Mystacina tuberculata*) found only in New Zealand. It has evolved into one of the most terrestrial of bats; several were netted, examined and released. New Zealand’s other bat species, the long-tailed bat (*Chalinolobus tuberculatus*), was trapped around roosting caves. These two insect-eating bat species are the only native land mammals in the island nation.

“One of the most extraordinary things we did in New Zealand was visit one of the [Waitomo] glow-worm caves,” Schulman said. Entered by boat, the dark, silent cave featured

“a huge, cathedral-like domed ceiling covered with thousands and thousands of little pinpricks of yellow-green lights – the glow worms.”

The worms are larvae of the New Zealand fungus gnat. They spin nests out of silk and leaf threads, covered with a sticky mucous, hanging loose like snares. The larvae emit a bioluminescent glow to attract insect prey, which become stuck on the threads. The effect, Schulman said, is “like little diamonds hanging down from the cave. It is very beautiful and very magical.”

The tour was limited to the northern half of New Zealand’s North Island, where some members were struck by the extent of deforestation in certain areas. “It was very sad,” Schulman said. “Forests were clear-cut and then monocropped, mostly with Monterey pines, so that previously rich forests were replaced by row upon row of only young pines. Some areas had only stumps sticking up.”

To Mary Read, the lost forests drove home the message that “destruction of native trees and forests is a terrible problem around the world. You come away realizing how important education is to tell the story of bats.”

“This was a fabulous trip. Everything about it was wonderful,” she said. “We covered a lot of ground, but everything was so well-timed that we had plenty of time to see everything we wanted to see. And I came away just amazed ... and very charged up about bat conservation. It was wonderful to see the devotion of so many people.”

“Thank goodness for the women who banded together to save the forests and flying foxes [of Ku-ring-gai], and for the Wimberleys and the people at the Tolga Bat Hospital, where high school kids come after school to hand-feed the bats and clean the cages. It was an eye-opening experience.”



Biologist Stuart Parsons displays an endangered short-tailed bat to Founder’s Circle members (from left) Michelle Steinmetz, Tommy Angell (center), Connie Kruse, Peg Smith and John and Cissie Mitchell.



(Left) Miriam Schulman of Los Angeles feeds a baby flying fox at Trish and Terry Wimberley’s wildlife rescue and rehabilitation center, a favorite stop on the BCI Founder’s Circle Ecotour. Baby bats (right) are wrapped in tiny blankets and even given pacifiers.



PROTECTING MEXICO'S CORN

Bats help keep the pests at bay

by **Leonardo J. López-Damián**

La Boca Cave in northern Mexico is home to about a million Mexican free-tailed bats, which consume huge numbers of moths that would otherwise ravage corn crops.

Corn is the heart and soul of Mexico's agriculture. It accounts for more than 60 percent of the nation's total agricultural output and 62 percent of its cultivated land. Up to 18 million people – some 17 percent of Mexico's population – depend on corn production for their livelihood. And bats help them do it.

Mexican free-tailed bats (*Tadarida brasiliensis*) make a major contribution to protecting these all-important corn crops from insect damage. That fact, however, is almost completely unknown to most farmers in Mexico, where bats face a wide array of perils. Although bats are invaluable to ecosystems and human economies, they are often persecuted because of needless fears born of myths and misinformation. Accurate information confirmed by scientific investigation can be a powerful tool in promoting bat conservation.

Under the direction of National Autonomous University of Mexico Professor Rodrigo Medellín, who heads the Program for Conservation of Mexican Bats (PCMM), I am conducting the first systematic study of the diet of Mexican free-tailed bats in Mexico. PCMM and its parent, BIOCONCIENCIA, which promotes conservation throughout Mexico, are sponsoring the study, which is designed to document the freetails' role in reducing corn pests. This project is supported in part by a BCI Student Research Scholarship funded by the U.S. Forest Service International Programs.

Among the most damaging pests of Mexico's corn crops are two insects: corn earworm (also known as cot-



Bats emerging from La Boca Cave each summer evening are becoming a tourist attraction, in addition to their role in reducing insect pests.

ton bollworm) moths (*Helicoverpa zea*) during summertime in northern Mexico, and fall armyworm moths (*Spodoptera frugiperda*) during winter months in the south. The larvae of these moths cause enormous destruction to corn plants and ears. Both moths are active primarily at night, and bats are primary predators of night-flying insects.

Both moths are also major crop pests in the south-central United States, where bats' economic values are well documented and many farmers, especially Texas cotton growers, have learned the lesson. Close to 100 million Mexican free-tailed bats spend their summers in caves, bridges and tunnels of Central Texas. Each bat can eat roughly two-thirds of its body weight in insects every night for a remarkable total of roughly 1,000 tons of insects nightly.

In 2006, an interdisciplinary research project concluded that the pest-reduction services of Mexican free-tailed bats in south-central Texas are worth an average of about \$740,000 a year to cotton farmers whose annual harvest is valued at about \$6 million.

But what is the bats' impact in Mexico? To find out, we decided to document the freetail's diet and how it changes across the nation. Millions of these bats spend winters in central and southern Mexico, then migrate to northern Mexico and the southwestern United States each spring. The bats' geographical and seasonal distribution coincides with the activity of the two major insect pests over cornfields, so bats obviously prey heavily on the moths. Our task was to document that and convince people of the direct economic value of protecting these bats.

We worked in three caves, each home to about 1 million Mexican free-tailed bats: La Boca Cave in northern Mexico; El Salitre Cave in central Mexico; and in the south, San Francisco Cave in the state of Chiapas.

We visited each cave once a month for more than a year, capturing bats as they returned from their nightly foraging. Even now, whenever we approach one of the sites, we are awestruck by the thick stream of bats emerging from the depths, their darting bodies and flapping wings silhouetted against the twilight sky. It takes up to an hour for these thousands upon thousands of bats – each one a voracious hunter of insects – to fly out of their roost.

We captured more than 1,500 Mexican free-tailed bats returning from their foraging bouts, and obtained nearly 900 samples for dietary analysis. Insect identification requires careful comparison of various pieces with pictures and descriptions of insects in the scientific literature, as in a complex jigsaw puzzle.

Our results showed a very diverse diet. Among bats from all three caves, we identified insect parts from 40 insect families that represented 15 orders. Major food items were moths, small beetles and true bugs, such as stinkbugs and seed bugs.

At La Boca and El Salitre, where Mexican freetails are



MERLIN D. TUTTLE, BCI / 8432301

largely absent during winter months, the diet is dominated by moths from July to September. This is right after adult flying moths begin to emerge from cornfields in June. In San Francisco Cave in the south, where freetails are found year-round, moth consumption peaks from January to March and again from August to December. This coincides with moth emergences from cornfields in the region.

Bats are clearly taking advantage of this abundant food supply and feeding heavily on moths that wreak so much destruction on Mexico's most important crop. The order Lepidoptera (moths and butterflies) accounted for approximately 63 percent of total volume of the Mexican free-tailed bat diet in our samples from all three caves. Our next step is DNA analysis of a subset of fecal samples to document the bats' consumption of specific crop pests.

BCI and PCMM have worked to protect these and other bat caves in Mexico for more than 12 years. The bat colonies in this study present complex challenges that require long-term commitment. For example, San Francisco Cave is being used as a drainage for local wastewater. We have been working for three years to convince the local government of the health risk, and La Trinitaria Municipality has begun work on a recovery plan that is to include a water-treatment plant.

We hope research such as ours may stimulate these and other conservation projects in Mexico. Efforts to protect bats must be solidly based on strong science, knowledge of local conditions and cooperation with the local people. Our goal is to provide clear and convincing evidence of bats' exceptional values and help people appreciate the economic payoff of protecting these bats and their habitats. Such knowledge can go a very long way toward building a consensus on bat conservation in Mexico and around the world.

LEONARDO J. LÓPEZ-DAMIÁN is a graduate student in biology at the Institute of Ecology of the National Autonomous University of Mexico.



You can help Bat Conservation International encourage promising students like Leonardo López-Damián to conduct important research around the world. Contact development@batcon.org to support the BCI Student Research Scholarship Program.

Bat Blitzin' in the South

by Darren A. Miller

I carefully removed the big brown bat (*Eptesicus fuscus*) from a mist net set over a creek and worked with a field assistant to record data. Before releasing the bat, I showed it to my field crew. Although this sounds like a typical day in the field for a bat biologist, it was far from it. On this night, the data recorder was my wife, and my daughters (ages 12 and 8) were part of my crew, which also included a graduate student from Illinois, a high school teacher from South Carolina and a wildlife biologist from Georgia. A dozen other, equally eclectic

short time by strategically scattering multiple teams across a targeted area for three days of intensive effort. Each team is led by a bat biologist with the experience, skills and equipment needed for surveying bats with mist nets.

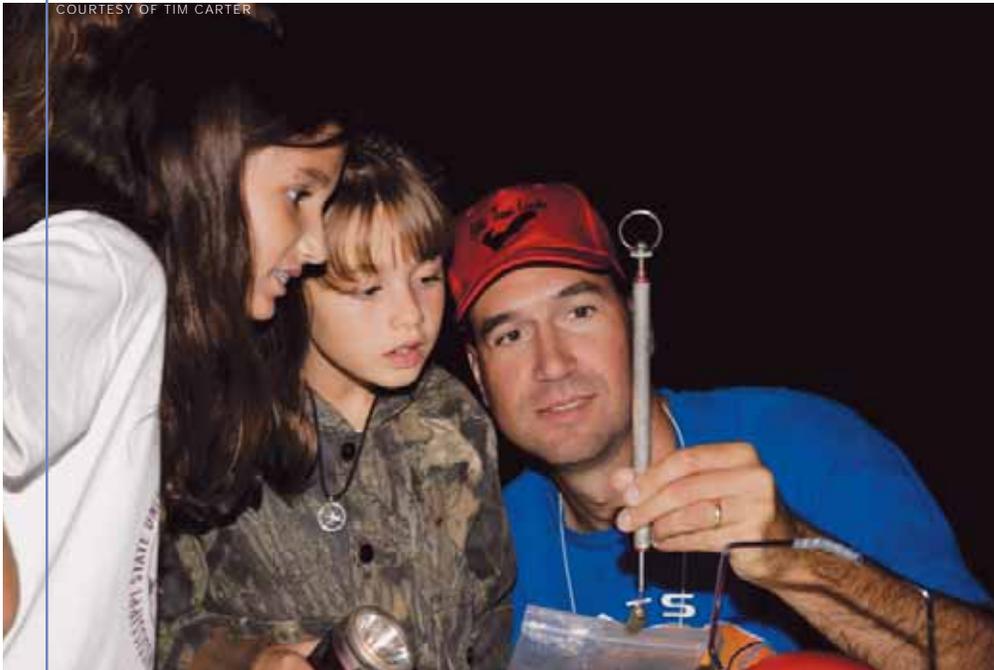
The three days of a Bat Blitz will yield as much data as a single biologist could collect in an entire season of fieldwork. And because the work is done by volunteers, the cost to the host agency is minimal. Over the course of six blitzes, we have surveyed 175 sites across five southeastern states. If undertaken by contract biologists, the cost of those surveys would have totaled more than \$260,000. Data from the 2003 Bat Blitz show that the Forest Service spent about \$6,000 on food, lodging, and supplies for volunteers who put in 1,308 hours of field work, valued at more than \$47,000.

In addition to providing information that helps land managers better understand and conserve local bat communities, Bat Blitzes provide excellent learning and networking opportunities for established and aspiring bat biologists, students and volunteer conservationists.

Participants in southeastern Bat Blitzes have come from more than 20 states and dozens of federal and state agencies, private corporations, universities and organizations. Non-biologists get a hands-on education about bats and research and gain a deeper appreciation for these fascinating animals. We have conducted public-education events at several blitzes, and local media attention is frequent and positive.

The Bat Blitzes are attracting more participants every year, suggesting some very encouraging trends. We are clearly seeing a growing interest in bats among land-management agencies and biologists in the southeastern U.S., and the importance of bats in maintaining healthy forests and ecosystems is being recognized increasingly by a variety of organizations and individuals. This bodes well for the future of bat research and conservation.

DARREN MILLER manages Weyerhaeuser Company's Southern Environmental Research Program and is based in Columbus, Mississippi. He is President-Elect of the Southeastern Bat Diversity Network (SBDN) and President of the Southeastern Section of The Wildlife Society. He thanks Joy O'Keefe (Clemson University) and Tim Carter (Ball State University) for helping with this article and all the SBDN members, Blitz hosts and volunteers who have made the Bat Blitzes a success story.



Darren Miller is assisted during the recent Bat Blitz by daughters Hannah (left) and Heidi in collecting data from a captured northern myotis (*Myotis septentrionalis*).

tic teams were also out with mist nets that night. Altogether, more than 100 bat biologists, students and others were capturing and recording bats in the Cherokee National Forest in Tennessee and the Pisgah National Forest in North Carolina. Welcome to the sixth annual Bat Blitz, sponsored by the Southeastern Bat Diversity Network.

Bat Blitzes are volunteer-based surveys that provide land-management agencies with a wealth of information on bat communities at minimal cost. The idea is to conduct a "rapid biological inventory," collecting a large volume of data in a

The next SBDN Bat Blitz will be in Bankhead National Forest in northwest Alabama on August 11-14, 2008.

Information: www.sbdn.org.

Bat houses for Norway

In Norway, several bat species roost in homes and other buildings, and homeowner complaints periodically find their way into the news media. Although often based mostly on unnecessary fears and a lack of knowledge, these complaints nonetheless produce bad publicity for bats.

Local officials usually advise building owners to wait until late autumn, then refurbish the roof or other access points to prevent bats from returning. That can be good advice, but it can also be expensive. And it leaves the bats in need of a new roost, which can simply transfer the problem to neighbors.

Tore Christian Michaelsen and Karl Johan Grimstad of the Norwegian Zoological Society set out to find a solution. With a grant from BCI's Global Grassroots Conservation Fund, they initiated the first project using large-size bat houses in Norway. Most bat houses in the region have been very small compared to the typical bat house recommended by BCI for use in North America.

Michaelsen and Grimstad wanted to investigate whether

the large bat boxes could be an alternative to refurbishing buildings to exclude bats and to document which bat species would use such boxes.

They used Bat Conservation International's bat-house plans, but with several modifications to meet local conditions. Because some bat species expected to use the bat houses are quite small, they limited roosting chambers to no more than three-quarters of an inch (1.9 centimeters) wide, with some as small as two-thirds of an inch (1.6 centimeters).

The bat boxes have two or three chambers and passages that allow the bats to move between them without leaving the house. Michaelsen and Grimstad considered the problem of overheating in their northern climate to be insignificant, so they did not include air vents.

Of the eight bat houses installed during the first year, seven were occupied by bats. One housed a large colony of more than 40 northern bats (*Eptesicus nilssonii*). Only 10 bats continued to use the building on which the bat box was situated.

No attempts were made to exclude the bats from this building – they just preferred the bat house.

The rest of the bat houses contained only small numbers of soprano pipistrelles (*Pipistrellus pygmaeus*) when the researchers visited them, but guano deposits beneath two of them indicated they had been used at some point by many bats.

The northern bat is the largest bat that commonly uses buildings as maternity roosts in Norway and these results show that the roosting space between bat-house partitions should be no more than three-quarters of an inch.

Michaelsen and Grimstad report that the results of their pilot study point strongly toward the increased use of large bat houses in Norway and help ensure enough funding to continue their research.

This Global Grassroots Conservation Fund grant was supported by The Hulebak-Rodricks Foundation, Mrs. Leon C. Houser, Ruth Gallagher and Noline Gannaway.



Northern bats that had been unwanted guests in a Norwegian building mostly abandoned the structure in favor of this large bat house that was mounted on a wall.

Help BCI support important bat-conservation programs like this one around the world through our Global Grassroots Conservation Fund. Please contact development@batcon.org.

Sign up for a 2008 Workshop

It's time to reserve your place at one of BCI's 2008 Bat Conservation and Management Workshops in Arizona, California or Pennsylvania. These intensive, six-day sessions offer an unmatched opportunity for professionals and serious amateurs to learn the latest bat research and management techniques and gain invaluable experience in the field.

The workshops feature lectures and discussions, field trips to examine bat habitat and hands-on training in capturing and identifying diverse bat species. Learn how to set and maintain mist nets and harp traps and to utilize radiotracking, night-vision observation and habitat assessment in bat research. The schedule:



- An Arizona workshop in the Chiricahua Mountains features a biodiversity unequalled anywhere else in North America. You can capture and examine as many as 18 bat species in a single evening, then watch endangered long-nosed bats visit hummingbird feeders at your front door. We will stay at the American Museum of Natural History's famous Southwestern Research Station.

Two sessions: May 20-25 and May 25-30, 2008. Each session is limited to 16 people.

Departure city: Tucson, AZ. Cost: \$1,395.

- A California workshop focuses on 14 species of bats in the Pacific Northwest. The unique lava formations at Lava Beds National Monument provide an unsurpassed opportunity to see how variations in cave environments impact bats' roosting behavior. We will set nets and traps at ice-cave entrances, over wet meadows and in mixed-pine forests. Workshop lodging is tucked between the Tule Lake

and Lower Klamath National Wildlife Refuges, with an exceptionally diverse community of waterfowl.

One session: July 19-24, 2008. Limited to 20 people.

Departure city: Medford, OR. Cost: \$1,395.

- At our Pennsylvania workshop, we will net and trap bats over trout streams and beaver ponds, observe endangered Indiana myotis swarming at a mine entrance and watch 20,000 little brown myotis return to their roost at a restored church. Workshop co-leader Cal Butchkoski of the Pennsylvania Game Commission is a leading expert on surveying and radiotracking Indiana bats, as well as one of America's most successful builders of bat houses and other artificial roosts. Workshop headquarters are at historic Greene Hills Manor.

One session: August 17-22, 2008. Limited to 20 people.

Departure city: Harrisburg, PA. Cost: \$1,395.

2008 Acoustic Monitoring Workshop

In response to many requests, BCI is offering an acoustic-monitoring workshop at California's Lava Beds National Monument. This session will cover hardware and software, including Anabat, Pettersson and SonoBat equipment, and participants will learn details of call identification and strategies for setting up an acoustic-monitoring program.

The workshop combines discussions of current research with hands-on demonstrations and fieldwork. Each night, we will capture bats and develop call libraries. BCI will have equipment available, but participants are encouraged to bring their own systems. This is an advanced workshop designed for graduates of previous BCI workshops or experienced bat workers.

One session: July 24-29, 2008. Limited to 20 people.

Departure city: Medford, OR. Cost: \$1,595.

For more information, registration forms and applications for a limited number of scholarships, visit www.batcon.org and click "Get Involved," or contact Workshops Coordinator Kari Gaukler at kgaukler@batcon.org.

Member Nights at Bracken Cave

Experience the unforgettable sight of 20 million Mexican free-tailed bats emerging at twilight from Bracken Cave. Listen for the soft flapping of countless wings as the world's largest bat colony spends hours swirling up out of the cave. Vast columns of bats, preyed upon by hawks and owls, disperse over the rugged Hill Country of Central Texas. By the time they return at dawn, these bats will have eaten some 200 tons of insects, many of them pests that attack farm crops of the region.

This is one of the most inspiring displays in the natural world, and members of Bat Conservation International enjoy an exclusive opportunity to witness it.

BCI protects this invaluable cave, located on the fringes of suburban San Antonio, and the immense maternity colony that uses it each summer to give birth and raise young. Until proper public-viewing facilities can be funded and built, visitation must be strictly limited. BCI members are invited to watch the emergence on specially designated nights.

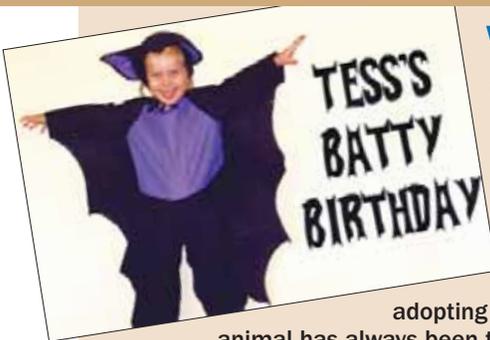
Reservations for the 2008 Bracken Member Nights are now being accepted. Space is extremely limited, so please register early. We'll send directions and additional information with your confirmation. (Please limit your party to four people. Neither pets nor alcoholic beverages are allowed at Bracken Cave.)

How to Register

To reserve your place for a Bracken Member Night, register online at www.batcon.org/memberevents. Or contact Lisa McCready at (512) 327-9721, extension 25.

The schedule for 2008: April 5 (Saturday), April 19 (Saturday); June 18 (Wednesday), June 28 (Saturday); July 9 (Wednesday), July 19 (Saturday), July 26 (Saturday); August 6 (Wednesday), August 16 (Saturday), August 29 (Friday); September 12 (Friday), September 27 (Saturday).

BCI member snapshots



What Tess Fleser wanted for her fourth birthday were bats – at least the ones in BCI's Adopt-a-Bat program. So in this invitation to her party, she requested donations for the adoptions. The Piedmont, California, youngster ended up

adopting two bats. "Tess's favorite animal has always been the bat," says her mom.

Tess's bedroom contains so many "bat pictures, stuffed bats, bat mobiles, etc. that "we now refer to it as "the Bat Cave."

Share a snapshot of your bat activities with your fellow members: Send it to Robert Locke, Bat Conservation International, PO Box 162603, Austin, TX, 78716.

The WISH LIST

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

Help for Ukrainian Bats

The Crimea has some of the largest and most diverse bat populations in Ukraine. A 2004-05 "Bat Census of Crimean Caves" confirmed that cave-bat populations have declined drastically, largely because of human disturbance. But the census also found evidence that tens of thousands of displaced bats had found refuge in about 10 abandoned limestone mines, where they formed maternity colonies. Only one of those mines has any protection at all. Biologists with the Ukrainian Centre for Bat Protection plan to survey these sites to develop information required by the Republic Committee on Environmental Protection. The group hopes to win official protection for the caves, then educate local residents and landowners on why and how they should conserve these bats and their roosts. The Centre requests a BCI Global Grassroots Conservation Fund grant of \$3,880.

Bridge Bats in Houston

Waugh Drive Bridge in Houston, Texas, is the summer home of some 250,000 Mexican free-tailed bats. BCI is working with the Texas Parks and Wildlife Department, City of Houston, Buffalo Bayou Partnership and local volunteers to develop a safe, educational viewing site at the Bat Bridge. Volunteers provide educational talks three nights a week to growing crowds who gather to watch the bats emerge each evening. BCI hopes to provide a small, wireless camera system so visitors can watch the roosting bats on a video monitor. We also plan to contribute two bat detectors to help educate schoolchildren, tourists and the local community about bats. Portable Wireless Video Security System: \$150 (additional cameras \$79 each); Pettersson D-100 Bat Detectors: \$300 each.

Calling all Rafies

Many biologists believe that Rafinesque's big-eared bats (*Corynorhinus rafinesquii*) should be considered for endangered species listing. However, the necessary data are not available because these bats are rarely captured in mist nets or detected by acoustic devices. Research Ecologist Susan Loeb of the U.S. Forest Service Southern Research Station hopes to change that. She plans to play recorded social calls of Rafinesque's big-eared bats at mist-net sites to test, under controlled conditions, whether these calls are an attractant that can increase capture success. Experiments will be conducted in South Carolina. Loeb requests a North American Bat Conservation Fund grant of \$4,300.

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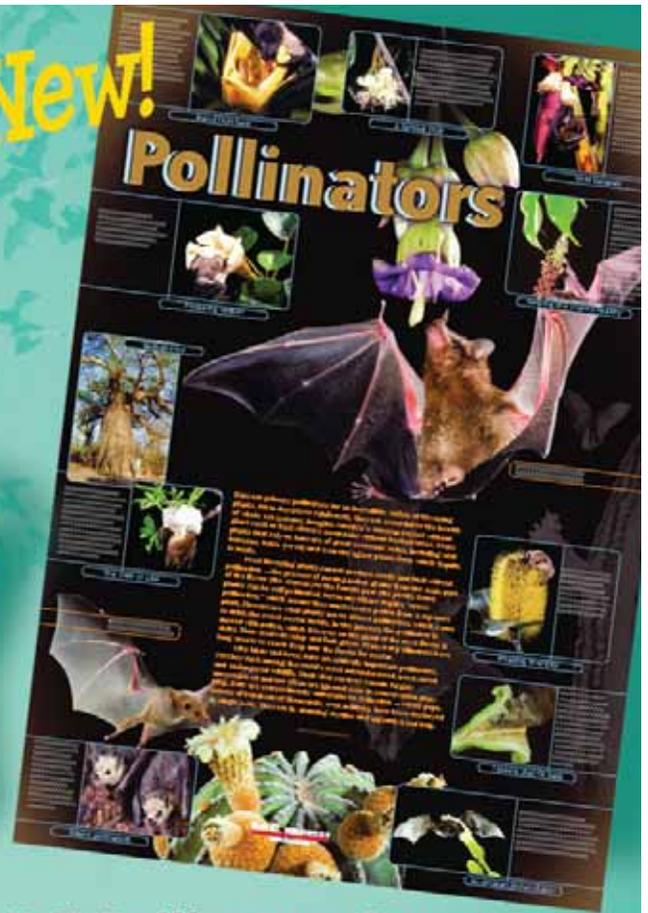
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