



# Dispelling Myths About Bats

Through research, education, community involvement, and conservation efforts in Mexico and the United States, the stigma surrounding these mysterious and often misunderstood creatures is being reversed

by Chris Hardman

In small classrooms throughout Northern Mexico, school children are singing the praises of Marcelo, the Mexican free-tailed bat. On the other side of the border in the southern part of the United States, children are devoted to Frankie, the Brazilian free-tailed bat. Both bats live in both countries; they spend the winter in Mexico and they summer in the United States.

And although they contribute greatly to the agricultural economy of each country, their presence sparks heated debates and sometimes violence. What many adults have yet to learn, however, these school children already know: bats are an essential part of the environment that directly benefit humans. They are the farmer's silent helpers, pollinating cash crops and providing pest control.

Marcelo came from the imagination of Laura Navarro, Education Coordinator for the Mexican non-governmental organization, the Bat Conservation Program (PCMM). With her bilingual children's book featuring Marcelo the friendly bat, Navarro challenges Mexican myths and superstitions by portraying bats as the peaceful, family-oriented mammals they are. Because Navarro believes that children learn better when they have an emotional attachment to a subject, she treats bats as a kind of pet or mascot and writes lively stories about them. "I think that information is not the [only] way to change. We need to go deeper," she explains.

Popular culture in Mexico—as in other countries of the Americas—portrays bats as blood-sucking vampires that prey on innocent people while they sleep. In the past, fear of these mysterious night creatures has led people to burn or dynamite the caves where they roost, killing millions of them. "It [was] the same everywhere," explains Navarro, "[people] think they are vampires." Lack of understanding and the ensuing violence prompted Mexico's foremost bat scientist Rodrigo Medellín to found PCMM in 1994. "When you start working with something like bats, that have an undeserved, unfair bad reputation, you have to start by improving the bats' image," Medellín says. As a professor at the Ecology Institute at the National Autonomous University of Mexico (UNAM), Medellín had the resources and background to develop education-based programs that would change the image of bats in the eyes of the Mexican people.



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To implement their strategy of conservation through education, PCMM programs begin in the classroom and then spread to the rest of the community. Over the years, PCMM has worked with approximately 70 of the communities that live near 22 of the most important bat caves in Mexico. Cave-dwelling animals that only come out at



night are difficult for most people to see, and as a result, human residents know little about them. Navarro says she has met many people who think bats are mice or birds. “What we do in the program is to try to give them information about the real natural history of the species,” she explains.

Since publishing *Marcelo the Bat* in 1997, Navarro and her partner, Mexican artist Juan Sebastián, have published six more bilingual children’s books about bats. Simple text and friendly drawings spark the reader’s imagination as they learn about bat family life where mothers nurse their babies and colonies migrate together

as one big group. Loveable bats, with names like Valentín, Don Sabino, Barbarita, and Lucia, draw the students into the bats’ life in a way they can relate to by showing them as family members who experience fear and happiness. Each book highlights a different type of bat—a fruit eater or a vampire—and features a story set in the geographic area the reader lives in.

The books are supplemented by lesson plans, classroom games, and hands-on



activities that offer even more information about bats. In addition, PCMM works with the adults in the community to connect their lives to the bats’ well being. Adults can take PCMM-run training sessions to become bat cave tour guides or learn how to start a business making and selling bat-related handicrafts to tourists. PCMM makes a long-term commitment to the communities they work with. After the initial three to four month visit, PCMM will return to the community at least once a year to replenish supplies and provide additional support.

PCMM visits hundreds of other communities through a series of radio shows Navarro created called *Aventuras al vuelo* [Adventures in Flight]. Beginning with Marcelo, PCMM produced twenty 15-minute shows with stories about bats including *Unos tipos de pelos* [Hairy Guys]; *Los poderes del eco* [The Powers of Echo]; *Las mamás y los cachorros* [Mothers and their Babies]; *Los Quiróptero frutillón* [The Fruit-eating



Early on, Medellín and other PCMM staff were able to see how well their educational programs were working. In 1995, when the legend of the *chupacabras*—a story about a creature that killed goats and sheep by sucking their blood—spread from Puerto Rico to Mexico, many caves were burned as people tried to protect themselves from the mythical beast. At the same time, PCMM had launched its pilot program at one of the most important bat caves in Mexico, Cueva de la Boca, located near Monterrey in Northern Mexico. The

stopped by the children in the community who had completed PCMM’s educational program. The children told the adults that Marcelo the bat lived in that cave and he was with his family and that bats help people. These passionate children, who had developed an emotional attachment to bats, were able to convince the adults not to kill the bat colony within.

“We are building a network of children and schools that are connected by their interest in protecting bats,” Medellín explains. He says that when PCMM returns to a community to start a new group of students, they find that the new group already knows quite a bit about bats. The only explanation, he believes, is that the first generation of students who came through their program taught the younger children about bats. “We have been working on caves for a long time, and now we can see the changes,” Navarro says. PCMM’s influence in the classroom increased dramatically eight years ago when they started educating the country’s



*Marcelo, the Mexican free-tailed bat, opposite top, and his United States counterpart, Frankie, the Brazilian free-tailed bat, above, help schoolchildren identify with bats. Some of the activities of their classroom conservation efforts include examining stuffed bats, opposite bottom, and building their own friendly bat kits, opposite center. Rodrigo Medellín, left, holding a Mexican long-tongued bat, is helping to change the bat’s negative image by teaching about the importance of bats in everyday life*

*Overleaf: Bats are important pollinators and seed dispersers*

Chiropteran]; *Cuarteles secretos* [Secret Barracks], *Guaridas y refugios* [Dens and Refuges]; *Chupacabras* [The Goat Killer]; and *Abuelita de Batman* [Batman’s Grandmother]. The award-winning series appeals to a variety of ages and is available to anyone with a radio. PCMM also produced an exhibit titled “Bats, A Myth in our Culture” that has traveled throughout the country. Housed in town halls or other public buildings, the exhibit is presented free of charge. Medellín estimates that in the past sixteen years, more than 200,000 people have participated in some aspect of PCMM’s educational programs.

legendary Cueva de la Boca used to be the home of one of the largest populations of Mexican free-tailed bats in the world, but due to habitat loss and human disturbance, the once great population of twenty million dropped to nearly one million.

During the *chupacabras* scare, some of the villagers who lived near Cueva de la Boca decided that the *chupacabras* was living in Mexico inside of the cave. Their fear spread throughout the community and a group set out to destroy the cave. “Picture a mob in a Frankenstein movie,” Medellín explains. At the entrance to the cave, however, the angry adults were

future schoolteachers on bat science at the Benemérita National Teachers’ School.

The bad reputation of bats in Mexico can be traced to two causes: real vampire bats, and the story of Dracula. Navarro, who is working on her doctorate at UNAM, explains that people in pre-Colombian times had neutral feelings toward bats; they were part of the landscape and were neither good nor bad. When the conquistadors came to the Mexico, they were startled by the small creatures that would swoop down and suck blood from their horses. The famed Spanish chronicler Bernal Díaz del Castillo wrote about this





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first encounter in his book *A True History of the Conquest of New Spain*. Some 300 years later in 1897, an Irish novelist named Bram Stoker came across Díaz's chronicles and incorporated the bat into the vampire myth. After Stoker wrote the novel *Dracula*, popular culture began to connect bats with vampires and assign them characteristics of evil and darkness.

One of the lessons PCMM teaches is how important bats are to agriculture in Mexico. In desert areas, bats—including the lesser long-nosed bat and the Mexican long-tongued bat—are the primary pollinators of one of Mexico's most important cash crops: agave. Bats feed on nectar from agave plants, and as they travel from plant to plant, they spread the pollen grains that stick to their fur to the next plant they visit. "The interdependence between bats and agaves is so strong that one might not be able to survive without the other," wrote bat researchers Don E. Wilson and Héctor Arita in an article for Bat Conservation International. Agaves, which are used to make tequila and to harvest henequen fibers, have been an important part of Mexico's economy and culture since pre-Colombian times. In addition to agave plants, researchers estimate that more than 300 types of fruits rely on bats for pollination including mangoes, bananas, and guavas.

While conservationists in Mexico have made progress in improving the reputation of bats, their counterparts in the United States have worked on proving how valuable bats are to people. In addition to pollination, bats perform another agricultural service: pest control. Every summer millions of free-tailed bats journey from their caves in Mexico to caves in the southern United States where they will give birth to and take care of one pup per female. The most popular destination for the summering bats is the Winter Garden agricultural region of Texas—a triangle between San Antonio, Laredo, and Eagle Pass.

With 697,950 acres of cropland in production, the farmers of Winter Garden grow nearly \$350 million worth of vegetables, cotton, and livestock. In the summer, the crops are plagued by the larvae of the farmers' worst enemy: the corn ear worm moth. Also known as the *tomato fruit worm* and the *cotton bollworm*, corn ear worm larvae—along with other agricultural pests—cost American farmers nearly one billion dollars a year in lost crops and pesticide expenses. If it weren't for the bats, researchers say, that amount would be significantly higher.

When the bats migrate to the United States from Mexico, they become part of a colony of 100 million bats that hunt nightly

for moths, beetles, and other insects. Female bats are especially hungry after giving birth in June, and they will maintain that hearty appetite for the next six weeks while they nurse their young. Researchers estimate that these nursing mothers will eat more than 70 percent of their body weight in insects each night, which means that a colony of 100 million bats can eat 2 million pounds of insects at a time. "We call it an ecosystem service," explains Gary McCracken, an evolutionary biology professor at the University of Tennessee. From research conducted in the field, McCracken was able to determine that during most of the summer, adult moths make up 30 to 40 percent of the bat's diet, and when the moths migrate from Mexico into Texas, the moths make up 90 percent of the bats' diet.

McCracken and his colleagues at Boston University, the US Department of Agriculture and the Texas Parks and Wildlife Department are working on calculating what monetary impact the bats have on farmers. "The economists call it an avoided cost," explains John K. Westbrook, a research developer for the US Department of Agriculture. "It is at least the amount of one or two pesticide applications a year." That includes the cost of the chemical and the labor to apply it. In addition, researchers say that the bats

might delay the farmers' need to apply pesticides and that Texas bats are helping the farmers in the northern states and Canada as well. "They are reducing the number of insect migrants that would infest fields farther north during the growing season," Westbrook explains.

For corn, the cycle begins in spring when adult moths lay their eggs on corn silk before the plants begin to bear fruit. Using corn as a nursery plant, one female moth can lay up to 1,000 eggs on 1,000 ears of corn per season. After the larva hatches, it crawls under the husk and feeds on the tender corn kernels at the top of the ear which exposes the rest of the ear to disease and molds. For a farmer trying to sell sweet corn, signs of damage or a chance encounter with a live worm can cut into as much as 50 percent of his profits.

Once the larva leaves the corn to burrow into the soil and begin the process of turning into a moth, the damage has already been done. Usually in July the




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A colony of lesser long-nosed bats, opposite, groom pollen from their faces after returning to their cave to roost. The Mexican free-tailed bat, top, is essential in controlling the insect/pest populations in large agricultural areas of Mexico and the United States. Evolutionary biologist Gary McCracken, above, is working with wildlife conservation groups who are studying the impact that bats have on farmers and their products

moths will emerge from the soil at an astounding rate of 40,000 per acre. The bats, who are highly-skilled hunters with insatiable appetites, will feast on these moths, preventing them from reproducing again.

Disseminating truthful information about bats is a full-time job for conservationists in the United States, where myths about bats are handed down from one generation to the next. One of most prolific bat promoting organizations in the world is Bat Conservation International (BCI) of Austin, Texas. Founded in 1982 by world-renown bat conservationist Merlin Tuttle, BCI has spearheaded educational and research projects in the United States and abroad for nearly three decades. They publish the world's only magazine devoted exclusively to bats, and they provide financial support to researchers and partner with international conservation organizations including PCMM.





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The Organization of American States is also supporting research and capacity building in bat ecology and management through the Western Hemisphere Migratory Species Initiative (WHMSI). Funded by the OAS–Special Multilateral Fund of the Inter-American Council for Integral Development (FEMCIDI), projects are building upon existing WHMSI efforts to significantly enhance the conservation of shared migratory species throughout the Americas by strengthening institutional and human capacity, political commitment, international cooperation, and public-private partnerships at regional, national and local levels. The Latin American Network for Bat Conservation supports the PCMM program through its project “Endangered and Migratory Bats in Latin America.”

Like the children in Mexico, school children in the United States have developed an attachment to a bilingual mascot who stars in an educational children’s book. Young readers follow Frankie the Brazilian free-tailed bat’s adventures as she searches for food, migrates between the two countries and becomes a mother. Texas Parks and Wildlife Department educators Nyta Hensley and Patricia Morton wrote the book, and a panel of scientists including John Westbrook and Gary McCracken served on a review panel for the book. In 2007, with funding from the National Science Foundation, the Texas Parks and Wildlife Department distributed 37,000 copies of the book to schools throughout Texas and in Mexico.

“If adults could only see the world through the eyes of children, they could relive the wonderment and excitement of discovery they too once experienced in their youth,” wrote Boston University Professor Thomas Kunz in the introduction to *Frankie the Free-tailed Bat*. “It tells a delightful story, based on scientific discoveries, that not only imparts new knowledge about this fascinating bat species to young readers, but also contains new information that will be of interest to a broader audience—that this species and others like it are valuable members of our environment that need to be protected.” ❁

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*Each night near twilight, millions of Mexican free-tailed bats emerge from Bracken Cave, near San Antonio, Texas, above, making it the largest concentration of mammals on the planet. Right: Rodrigo Medellín stands outside Pinacate Cave in the Mexican Sonora Desert, home to thousands of lesser long-nosed bats. Medellín was an Associate Laureate in Rolex’s Award for Enterprise program in 2008. In addition to debunking myths surrounding bats, he will be able to use the prize money from the award to further his bat conservation efforts in Mexico, which includes bat cave preservation*

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