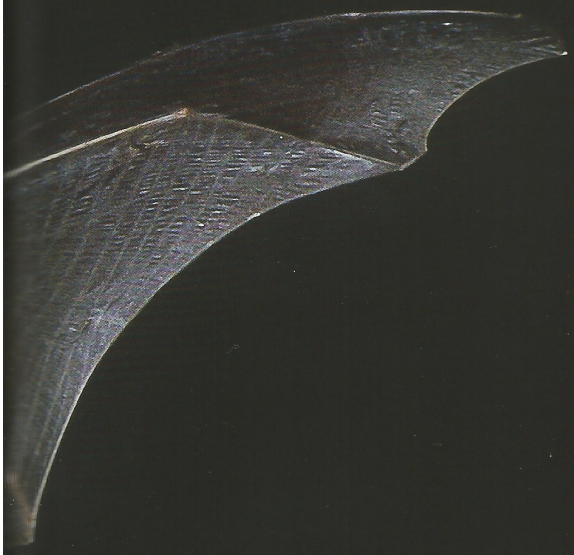
In the first episode of *The Invisible Mammal*, a film series by Kristin Tieche about the obstacles bats face to survive, we meet Corky Quirk, the founder of Northern California Bats, an organization dedicated to rescuing orphaned, sick and injured bats and educating the public about these misunderstood and increasingly vulnerable animals. After watching the documentary, we asked Tieche to interview Quirk for *Wild Hope*.



THE BAT RESCUER

INTERVIEW BY KRISTIN TIECHE
PHOTOGRAPHS BY MERLIN TUTTLE

KRISTIN TIECHE: Tell us about your work with bats as both a rescuer and an educator.
CORKY QUIRK: Northern California Bats (Norcal Bats) is based out of the Sacramento Valley. Our bat rescues take place mostly in the Central Valley and the surrounding foothills. I have permits from the California Department of Fish and Wildlife and the US Department of Agriculture to use bats that are not able to be released back into the wild for education. I take them to schools, libraries and festivals where I show people why bats are important.

KT: What inspired you to start working with bats?
CQ: I was hired to do environmental education in the Yolo Bypass Wildlife Area outside of Davis, California, teaching kids about wetlands and birds. There's also a very large colony of bats there. The more I learned about the bats, the more I wanted to share.

KT: What are some of the most fascinating things you've learned about bats through your work?
CQ: One of the comments I hear most is how small bats are. Most bats worldwide are very little and most eat insects. All of our bats in the United States are

BRAZILIAN (AKA MEXICAN) FREE-TAILED BAT
Tadarida brasiliensis

insect eaters. We do have a couple in our southern deserts that also drink nectar. They're much calmer animals than I would have expected. They're not aggressive. They protect themselves if they feel threatened. Generally, their first step of defense is to get away rather than attack, bite or bare teeth.

KT: Like most animals?
CQ: Yes. It doesn't take them long in rescue to understand when we're trying to help. They're intelligent animals. They learn quickly that I'm not trying to hurt them and that I provide food and a place where they feel safe.

KT: Tell me more about bat rescue.
CQ: When a person finds an injured wild bat, we ask them to contain it so that it doesn't get away and hide. Then they should call wildlife rescue for advice. We send a volunteer to retrieve the bat and to assess if the bat is sick or injured. If we can't send a volunteer, we talk the person through how to contain the bat and transport it, if needed. If the bat needs to go to a veterinarian, then we transport it for veterinary care and provide supportive care. If the bat becomes healthy and flighted again, then we release it into the wild.

KT: How many bats do you rescue per year?
CQ: We get probably around 100-150 a year, with a variety of problems. They have a 40 percent survival rate, which is pretty typical for wildlife rescue.

KT: How do you release recovered bats back into the wild?
CQ: Many bats are colonial animals, and they need to go back to their home. So we follow a "three-mile rule": The animal needs to be returned within three miles from where it came. The reason we don't return them a long way away is that they will work very hard to try to find their colony.

KT: Many people consider bats a nuisance or a pest or they're afraid of them. What are you doing through education to change people's attitudes about bats?
CQ: I try to help people understand that bats are important because they are our number one natural nighttime insect control.

LONG-EARED MYOTIS
Myotis evotis

I focus my efforts on people who are fearful. When we're afraid, humans tend to not stop and think. We react. If I can help people understand that bats are important — that they're not aggressive, they're not after us — then, when a person notices a bat in their area, they won't be fearful and try to kill it.

KT: While I was making the film *The Invisible Mammal*, I attended a Bat Talk and Walk that you gave at the Yolo Basin Foundation. Could you describe what people encounter when they join these tours?
CQ: Yolo Basin Foundation is responsible for the education programs at the Yolo Bypass Wildlife Area. We have many tours throughout the summer. The female bats come to the Sacramento Valley in the summer. That's where they give birth. One of the roosting locations, maternity colonies, is the Yolo Causeway, the freeway bridge that runs between Davis and West Sacramento, where they live in the expansion joints.

The majority of the bats in that colony are Mexican free-tailed bats. It's a large colony for Northern California. It's an urban colony, and it's accessible, so people actually have the opportunity to see it.

At sunset, we caravan to where the bats fly from underneath the causeway and watch their exodus. About a quarter million bats live underneath that bridge. It's a pretty impressive sight.

KT: In the film, you discuss how the drought in the West and climate change in general have affected bats. Could you further explain these threats?
CQ: I expect that as our climate changes, where species live will also change. Being flying mammals, bats have the advantage of being able to move. Who knows, maybe we'll actually end up with vampire bats in the United States!

For many of the insects that North American bats eat, their larval stages are aquatic. When you have drought and less water, you're going to also have fewer insects around water, so that decreases bats' food supply. The adults probably will survive, but they may not reproduce as well.

Bats only have one baby per year with about a 25 percent survival rate, which is fairly normal for wildlife. Missing birthing seasons can have quite an impact on the overall population size. Different species of bat are affected more than others by drought. In Northern California, we have 17 different bat species. That's pretty good for a temperate climate.

KT: That sounds very biodiverse to me.
CQ: I tell people that on our planet we have 5,400 species of mammals; 1,300 of those species fly. So not only are bats the only mammal that can fly, there are a lot of them. Different species eat different kinds of food. Having diversity is important in order to target the many different kinds of insects.

KT: How does the threat of habitat loss affect bats?
CQ: Tree bats roost in hollows, and when trees are cut down at inappropriate times, those roosting sites are removed, and bats may not find a comparable location. If you take out a really good roosting location, it doesn't mean that bats can just find another one.

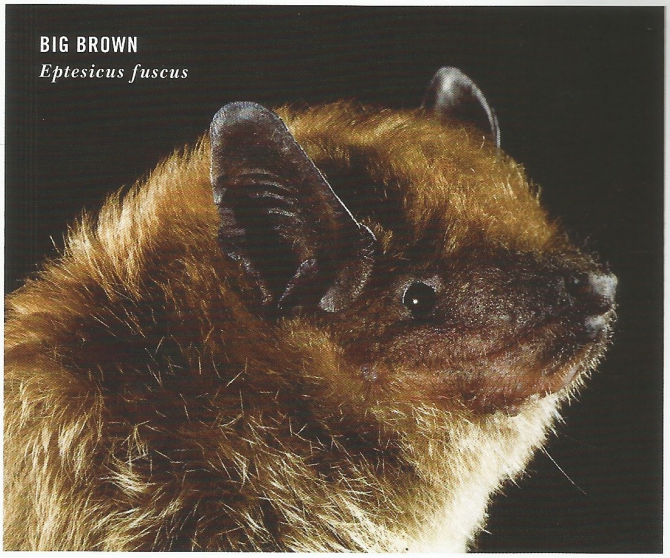
Also, as agricultural areas are changed from certain kinds of crops to other types, the insects will be different. The bats in the local area may not eat those other kinds of insects. And then, of course, pesticide use diminishes the food supply and also can build up in their system. I haven't seen any studies about what pesticides do to their systems, but I have seen studies that show elevated pesticide levels in the bodies of bats living in areas where pesticides are used.

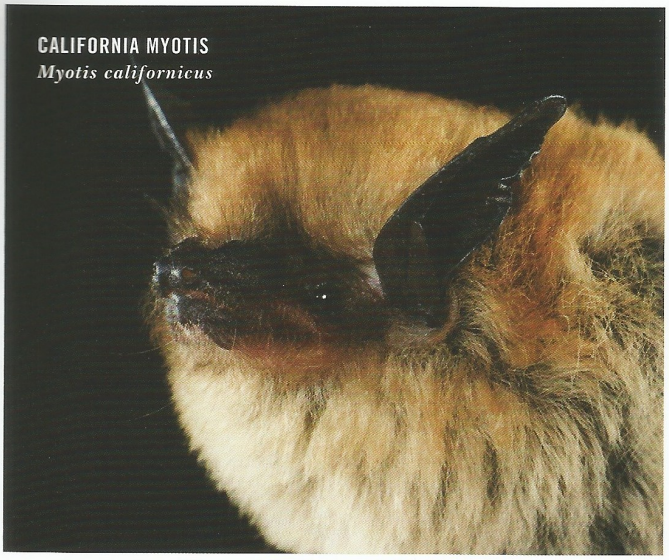
HOARY
Lasiurus cinereus

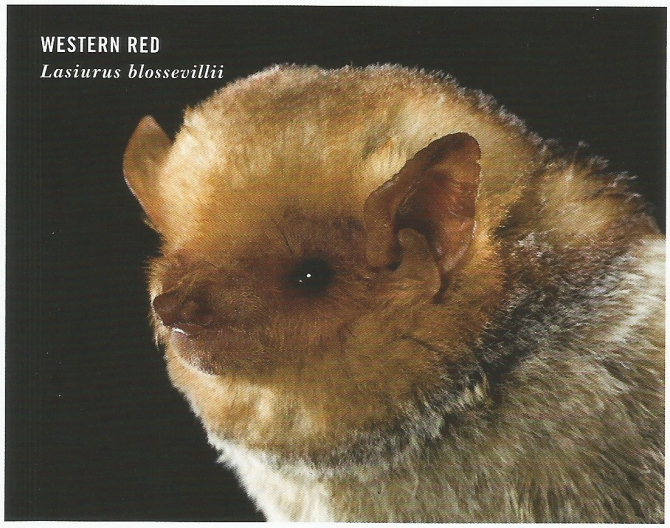
KT: Let's talk about White Nose Syndrome, the disease that has decimated millions of bats in North America.
CQ: White Nose Syndrome (WNS) in bats is caused by a fungus that was first seen in New York State in the winter of 2004 — 2005. Fungus is an irritant — think about athlete's foot — and when the fungus gets onto hibernating bats, it causes them to wake up too often, and they burn up their fat reserves. Also, the fungus can grow on bats' wings, which then degrade and end up with holes and tears. Then bats can no longer fly.

In some of the caves, biologists are finding death rates of up to 99 percent.

PALLID
Antrozous pallidus


BIG BROWN
Eptesicus fuscus


CALIFORNIA MYOTIS
Myotis californicus


WESTERN RED
Lasiurus blossevillii


PALLID
Antrozous pallidus


CANYON
Parastrellus hesperus


WESTERN MASTIFF
Eumops perotis

Bat Stats

Bats are the only mammals that fly.
Of **5,400** species of mammals, **1,300** are bats.
26 species are Critically Endangered.
51 species are Endangered.
954 species are Vulnerable.
In North America White Nose Syndrome has killed more than **5.7** million bats.*

Scientists write about walking into caves to do their research where there have been huge colonies and then come back and to find maybe 100 bats.

Since bats only have one baby per year, the chance of reproducing and having colony sizes anything near like we've seen…it's not going to happen in our grandchildren's lifetime, if it ever happens.

KT: WNS has been decimating bat populations mostly on the East Coast, but it was detected in Washington State in 2016. Is this a game changer for bats living in the West?
CQ: The closest site where the fungus that causes WNS had previously been detected was 1,300 miles away from Washington State. Since the fungus can't transport itself and bats don't fly that far, that means it was moved there by humans. Once again, we have brought something into our environment that's devastating to other animals. [Editor's note: Bat expert and photographer Mervin Tuttle says that the arrival of WNS in Washington wasn't necessarily transported by humans. An infected bat could have hitchhiked there on a truck or train shipping container. WNS has spread rapidly from coast to coast, despite decontamination and cave closure policies, so bats are spreading it faster than cavers, he says.]

It's a waiting game to find out how West Coast bats will be affected. There will be bats that die from this fungus.Washington State isn't that far from California and bats fly north and south along their migration trail. On the other hand, the length of time for hibernation isn't as long as it is on the East Coast. Our climate, temperature and humidity are different.

Our bats don't tend to roost in colony sizes as large as they do in the East. They may have a better survival rate because of that. I'm particularly worried about the little bats, the genus Myotis, which includes the little brown bat, California bat and Yuma bat. The little bats don't have huge reservoirs of fat when they go into hibernation because they're so small.

KT: Is there any sign of a cure for WNS?
CQ: The US Forest Service has a study using bacteria from bananas to decrease rot rate. Researchers have collected bats exposed to White Nose Syndrome, treated them in a lab and helped them recover. It's one thing to have 40 bats in your lab. It's another to have 100,000 in a cave and try to reproduce the results. So we'll see. There's still a lot of research that needs to be done to make sure that we don't destroy cave ecosystems by accidentally introducing something else, which humans are certainly capable of doing.

KT: In the film, you talk about the dichotomy between the billions of dollars that bats save the agriculture industry each year and the lack of dollars going into research to find out a cure for WNS.
CQ: I don't understand why there isn't more money for research from the farming or forestry industries. It seems like those who benefit from bats would want to support ways to correct this issue.

KT: With the problems of WNS, habitat loss and climate change, how do you recommend that an ordinary person can help save the bats?
CQ: Habitat loss is huge, but we can help by planting native plants that attract native insects, which is what the bats eat. We can avoid using pesticides when we're gardening in our own yards.

Bat houses provide roosting locations for certain species of bats and give them a place where they're not constantly being kicked out, because a lot of bats roost underneath eaves and places where people don't want them.

As far as WNS, humans should stay out of caves where bats live. If someone does enter a cave, then he/she should research proper techniques for cleaning shoes and clothes to stop spreading this fungus.

We can help other people understand that bats are not scary animals attacking us, sucking our blood, flying in our hair. All the myths surrounding bats cause fear and lack of understanding, which leads to people destroying colonies or sealing up caves.

KT: What keeps you inspired to continue working with bats?
CQ: When I can change somebody's mind or build on the enthusiasm that they already have, I feel like I'm making a difference. I talk to a lot of children. Kids have open minds. An amazing number of adults come to the Yolo Basin Foundation presentations who have never learned about bats before. When they say, "I used to be afraid of bats, but now I'm not," those reactions feed me. WH

To view *The Invisible Mammal* and to support the making of the film series, visit theinvisiblemammal.com. To learn more about NorCal Bats and see a schedule of their educational events, visit norcalbats.org. More of Mervin Tuttle's bat photos can be seen at merlintuttle.com.