



WHY

BAT CONSERVATION

IS IMPORTANT IN LIGHT OF COVID-19
AND HOW YOU CAN HELP

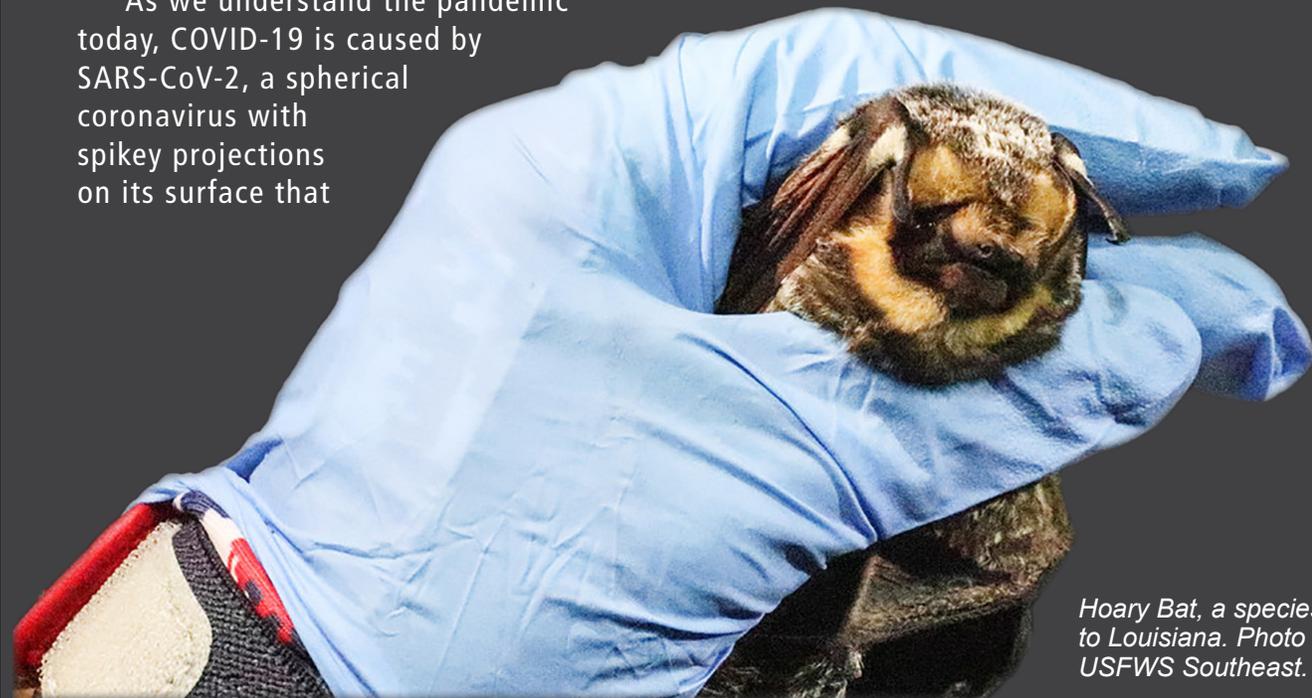


By Dr. Ashley M. Long, Assistant Professor of Wildlife Ecology, LSU AgCenter

While animal sources of COVID-19 have not been confirmed, bats in China are suspected reservoirs of the current global pandemic. Recognition of this potential zoonotic spillover event has prompted increased efforts to understand the pathways of bat-borne disease transmission, to learn more about the importance of bats to our ecosystems and economies, and to identify how we can help conserve these remarkable mammals. Such information could minimize risks associated with the current and future pandemics while protecting wildlife that contribute to overall biodiversity and are essential to the well-being of humans around the world.

As we understand the pandemic today, COVID-19 is caused by SARS-CoV-2, a spherical coronavirus with spikey projections on its surface that

is known to affect both birds and mammals. Scientists have identified hundreds of coronaviruses, but only seven are known to affect humans, and most cause only mild-to-moderate symptoms. Scientists think that SARS-CoV-2 may have passed from bats in China to an intermediary host like pangolins, a group of mammals that resemble armadillos and have SARS-CoV-like coronaviruses. Once the pathogen entered the host, the virus may have evolved into its current state prior to entering humans, or a nonpathogenic version of the virus could have passed from the host to humans then evolved to its current state within the human population.



Hoary Bat, a species native to Louisiana. Photo by USFWS Southeast.

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Transmission from the intermediate host to humans likely occurred at a live wildlife market in China. These establishments sell live and dead animals for human consumption and can create conditions that facilitate zoonotic spillover events, as we've seen with COVID-19. This is because animals at live markets are often caged in close proximity with species they would typically not interact with in the wild, including humans. However, live markets are not the only way that zoonotic spillover events can occur. Humans may be exposed to wildlife diseases during any activities that require handling or transporting infected animals or animal products. The modifications that humans make to their environments (e.g., clearing for development) can also create situations where people and wildlife interact more regularly than would happen under natural conditions, increasing the potential for wildlife-mediated infections to occur.

Regardless of how SARS-CoV-2 originated, once the virus passed to humans, COVID-19 spread as a result of human-to-human contact. To date, there is no evidence that SARS-CoV-2 passes directly from bats to humans or that this particular coronavirus occurs in North American bats or other wildlife. There are concerns that humans could transmit SARS-CoV-2 to our native bat populations, which may be more susceptible to infection if the virus did indeed originate in bats. In addition, it is possible that humans could infect other wildlife species or domesticated animals with SARS-CoV-2.

As such, scientists are working hard to understand how vulnerable our native bats and other wildlife might be to SARS-CoV-2. Given their size, ability to fly, roost locations, and nocturnal behavior, bats can be difficult to study in the wild, but what we've learned in recent decades is fascinating. We now know that bats represent incredible diversity — over 1,400 species worldwide — and they provide numerous ecosystem services, including pest control, crop pollination, fertilization and nutrient redistribution among others. Scientists estimate that one bat can eat up to 6,000 mosquitos per night. Collectively, bats save U.S. farmers more than \$3.7 billion dollars per year by reducing crop damage and pesticide use. In addition, bats are highly social, use complex signals to communicate, and use echolocation to navigate and hunt, a process we've only observed in a handful of other species. We could also learn a lot from bats from a biomedical perspective — they are long-lived relative to similarly sized mammals, appear resilient to some cancers, and can survive exposure to harmful chemicals that critically damage the cellular DNA of other species. Understanding how bats fight off inflammation or why they are immune to some diseases could even help us respond more effectively to the current and future pandemics.

Unfortunately, nearly one-third of bat species in the U.S. are experiencing population declines associated with habitat loss and degradation, disease (e.g., white-nose syndrome) and collisions with human infrastructure (e.g., wind turbines). Loss of forested habitat has been particularly problematic, as almost all bats that occur in the U.S. use trees for roosting, foraging and other activities during some portion of their lives. Given these declines, several bat species that use forested landscapes are now listed as federally threatened and endangered, and most other bat species in the U.S. require more information on their life histories and ecologies to make informed conservation and management decisions in light of current and emerging threats.



Watching bats forage at sunset above a pond in Louisiana.

We have 12 bat species in Louisiana, and they use a variety of habitats for roosting and foraging, including forests, wetlands, grasslands and urban settings. Given their ecological and economic importance, many people in Louisiana and throughout the U.S. are working hard to conserve these amazing creatures. You can contribute to local bat conservation efforts by landscaping with native vegetation, which will encourage a diversity and abundance

of the insects that bats use as food resources, or you could install a bat house on your property. You could also retain snags and some large-diameter trees (especially those with visible cavities or shredding bark) to provide bats with roosting habitat and leave buffer zones of vegetation near water bodies or in riparian areas to provide bats with foraging habitat and travel corridors. Most importantly, follow these precautions to help keep yourselves and our bats safe.

- If you see a live bat lying on the ground or roosting in a building, avoid contact. Call your local wildlife agent, animal control agency or public health official if the animal appears sick, as bats carry other diseases (e.g., rabies) that can be problematic.
- If you find a dead bat, use gloves to pick it up, place it in a sealed container, wash your hands, and contact your local public health official.
- Prevent bats from moving into human living quarters and other buildings. First, carefully inspect the structure for small openings through which bats could enter (e.g., roof edges, broken or poorly fitted screens, places where boards or shingles have come loose). Then seal the openings with caulk, flashing, screening or heavy-duty mesh. Consult online resources or contact your local AgCenter extension office for additional guidance.
- If you need help removing bats from a building, hire a licensed nuisance wildlife control operator. You can find a list of individuals permitted by the Louisiana Department of Wildlife and Fisheries at <https://www.wlf.louisiana.gov/page/nuisance-wildlife-control-and-removal>.
- Bats rarely bite or scratch people if left alone. Nevertheless, if you or your child has been scratched or bitten by a bat, contact your local public health official immediately. While there is no evidence that SARS-CoV-2 passes directly from bats to humans, many wildlife species carry other diseases (e.g., rabies) that are preventable if treated before symptoms appear.
- Use personal protective gear (e.g., gloves, masks, safety glasses) when cleaning up bat droppings. First, dampen the droppings with water. Then clean the area with soap and water. Finally, disinfect the surfaces with a bleach solution (1 part bleach to 9 parts water). Bag and discard any contaminated material, and wash your hands and supplies when you're done. Consult resources available through the Centers for Disease Control and Prevention or Occupational Safety and Health Administration for additional guidance.

You can learn more about bats and the ecological services they provide on websites administered by the LSU AgCenter, Louisiana Department of Wildlife and Fisheries, Bat Conservation International, and Bat Conservation and Management. We also encourage you to

head outside at dusk and enjoy the show from afar. Bats are true aerial acrobats, and watching them forage on flying insects can be an exciting way for you and your families to spend more time in the great outdoors!

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