



Nature's Sanitation Service: The Cost of Being a Scavenger

by Ashley M. Tanner, Michael A. Kalisek,
Evan P. Tanner, and Clayton D. Hilton

Industrialization and technological innovation have allowed humans to achieve remarkable feats, but not without consequences. The Romans, great innovators and architects, piped spring water to homes in lead pipes and drank from lead containers. As a result, their water contained up to 100 times more lead than water at the source. The bones of ancient Romans contained more lead than those of the humans who lived through the Iron Age, potentially causing a decline in birth rates.

Though scientists concluded that lead was unlikely behind the fall of Rome, environmental contaminants have affected human and wildlife health for over 2,000 years. Scavengers that have adapted well to living among human populations are especially susceptible to exposure to environmental contaminants and diseases. Their attraction to decomposing material brings them to our trash cans and landfills, exposing them to plastics, metals, and materials that they may not have encountered otherwise. Moreover, this decomposing material can foster the growth of potentially pathogenic bacteria, viruses, and fungi.

Scavengers offer a natural sanitation service, recycling our roadkill into nutrients that return to the environment and preventing the spread of disease by removing decaying material. Vultures are an obligate



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Dr. Evan Tanner and Texas A&M-Kingsville student volunteers remove a captured vulture from a mailbox. Because the mailbox is just the right size for the vultures, researchers use them to keep birds safe and calm during data collection.

scavenger, feeding solely on dead animals or carrion. They have evolved to be relatively resistant to the effects of environmental contaminants, but still harbor them in their bodies. This makes vultures an excellent indicator of the state of contaminants in the environment.

In partnership with the USDA Wildlife Services in Texas and the U.S. Customs and Border Patrol in Kingsville, we initiated a study to determine the contaminants present within the two species of vultures native to South Texas: black vultures and turkey vultures. In March and November 2021, we collected blood and cloacal samples from both species of vultures. Blood samples were tested for the presence of lead, while cloacal samples were sent to a lab to determine what bacteria and fungi may be present.

Most of the bacteria present in our samples are common in gastrointestinal tract of animals. *E. coli*

Editor's note: Dr. Ashley M. Tanner is an Assistant Professor of Research with the CKWRI. Mr. Michael A. Kalisek is an undergraduate student in the Dept. of Rangeland and Wildlife Sciences. Dr. Evan P. Tanner is an Assistant Professor and the Meadows Professor of Semiarid Land Ecology at the CKWRI. Dr. Clayton D. Hilton is an Associate Professor and the Jo and Bruce Gunn Endowed Director of Veterinary Technology at the CKWRI. ~



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Dr. Clay Hilton swabs the cloaca of a vulture restrained by a student volunteer.

was present in 100% of the black vultures captured in March, while *Salmonella* species were present in 60% of individuals. Concerningly, some *Salmonella* species detected were resistant to up to 13 different antibiotics. The presence of such strains in the environment is a concern for human/domestic animal health and the treatment of infections. A *Chlamydia* species was found in 36% of birds tested in November, while the fungus *Trichosporon asahii* was found in 6%. Though many of the bacteria and fungi detected can cause illness in humans, the likelihood can be greatly reduced by practicing good hygiene.

Blood lead levels varied from below 0.034 parts per million to over 0.65 parts per million. Though turkey and black vultures are relatively tolerant of lead exposure, other species can be much more sensitive. For example, endangered California condors will begin to experience significant effects to their health at just 0.20 parts per million. Blood lead levels measured in our vulture populations were, on average, much higher than blood lead levels recorded in other parts of the United States (e.g., California).

Overall, our findings suggest that wildlife in South Texas may be exposed to potentially harmful levels of lead as well as antibiotic-resistant bacteria in the environment. Though we did not determine how this exposure affected the vultures we captured, initial documentation of these contaminants is critical if we are to form a baseline index for future monitoring and to detect changes over time. ~

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<http://www.ckwri.tamuk.edu>



Did You Know?

The Texas blind salamander is an active predator even though it can't see. It moves its head from side to side searching for food on the bottoms of water-filled caves. (Texas Blind Salamander, TPWD Wildlife Fact Sheets)

CKWRI News

Exciting New Endowment

The Robert and Laura Underbrink endowment was recently established. This endowment, honoring the Underbrinks, was created by Angie and Billy Lemmons to support quail research.

Second Meredith Long Internship

We are currently recruiting for our second Meredith Long Internship recipient. The first internship last year was a huge success! Christian Guajardo used drones to study wild pig damage to crops during his internship. This internship was made possible by the support of Cornelia Long and her passion for training the next generation of scientists.

New Regents Professor



Congratulations to our own Dr. Fidel Hernández on being named a Regents Professor. The Texas A&M System Board of Regents established the Regents Professor Awards program in 1996 to recognize faculty who have made extraordinary contributions to their university, as well as to the people of Texas. Well done, Fidel! ~

Forty Years of Wildlife and Habitat Conservation

by David Hewitt

Leroy G. Denman, Jr. Endowed Director
of Wildlife Research

The Caesar Kleberg Wildlife Research Institute (CKWRI) drew its first breath in 1981. The original mission was to conduct applied research on habitat and wildlife in South Texas, also known as the Last Great Habitat. For 40 years, CKWRI scientists have pursued this mission. CKWRI has grown from a unit with 7 scientists, 4 staff, and a couple dozen master-level graduate students to a nationally recognized research institute of 23 scientists, 15 staff, and nearly 60 MS and PhD graduate students. The first advisory board was established in 1984 with 9 members, and now that advisory board has 19 members who, like the original board members, are passionate about wildlife conservation and the Institute's mission. The Institute had no endowment 40 years ago and now has an endowment with a corpus of nearly \$50 million.



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Graduate students prepare a drone for a field research mission.

Over the last 4 decades, the Institute has developed labs for cutting-edge research techniques, including genetic analysis, geographic information systems, quantitative ecology, and drones. With the help of its many supporters, the Institute built the Tio and Janell Kleberg Wildlife Park that includes a stunning Wildlife Center, captive research facilities for white-tailed deer and birds, and a necropsy lab. CKWRI is one of the few wildlife research programs in the nation that is supported by a veterinarian. The Institute has 8 endowed faculty positions, more than any other wildlife program in the country. Over 350 CKWRI alumni work across Texas and in over 40 states around the country, promoting wildlife conservation and private land stewardship. CKWRI scientists share their knowledge broadly by having published 27 books, dozens of book chapters, nearly 1,000 scientific articles, and even more popular articles for wildlife managers.



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Texas Native Seeds' Concho Demonstration Garden.

During the last 20 years, CKWRI and its supporters built South Texas Natives as well as Texas Native Seeds. These programs have become the most impactful habitat restoration programs in the state. In addition to strong roots in the hunter-conservationist tradition, the Institute is developing a program in wildlife photography which directly benefits our graduate students and engages an increasing number of new supporters.

By The Numbers

900 miles separate the Central and South American populations of Green Jay. The two groups differ in color, calls, and habitat use, and may actually be different species. South American green jays are larger than their Central American cousins and have a crest in front of their eyes. (The Cornell Lab. Green Jays. www.allaboutbirds.org)

Advisory Board

The Advisory Board of the Caesar Kleberg Wildlife Research Institute (CKWRI) provides leadership in all aspects of our work. We are indebted to them for their commitment to the CKWRI and its mission.

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CKWRI is blessed by generous and passionate supporters. Landowners throughout Texas open their gates, providing access to millions of acres for research. The Institute's supporters provide funds for CKWRI to conduct research to answer their management questions. These same supporters share their observations, experiences, and challenges with CKWRI scientists, ensuring our research remains true to the applied mission of the Institute.

The Institute's past is a story of growth and adaptation, resulting in positive impacts on conservation. The Institute's future looks just as bright because of the outstanding scientists, students, staff, and supporters working on behalf of wildlife conservation in the Last Great Habitat and across Texas.

Til our paths cross. ~

What Do They Eat?

Adult Merriam's turkeys eat varying amounts of arthropods, pine nuts, fruits, herbaceous vegetation, and seeds depending on season and rainfall. (Rumble and Anderson. 1996. Feeding Ecology of Merriam's Turkeys (*Meleagris gallopavo merriami*) in the Black Hills, South Dakota. *Am. Midl. Nat.*)

New Year, New Look

The old South Texas Wildlife newsletter served us well for many years, but it was time for an update. The scientists at CKWRI conduct research all over the world, so we thought a new name was in order. To coincide with our new name we engaged a local artist and Texas A&M-Kingsville Range and Wildlife graduate, Jo Marie Prukop-Falcon, to create a new header for us. Here's a little about the artist:

Jo Marie Prukop-Falcon is a South Texas native who lives in Bishop, TX, with her husband, Rene, and their two young sons. She spends her days raising kids, dogs, and varieties of livestock, such as Dorper sheep and Andalusian horses. Jo Marie has lived and worked in agriculture her entire life and is currently the Food Safety manager for the family watermelon farming operation. She enjoys many creative media, including painting, drawing, leather tooling, singing, and music. The beauty and unique diversity of South Texas wildlife and landscapes have been lifelong sources of artistic inspiration.

Look for quarterly changes in Jo Marie's artwork to reflect the beauty of each season. ~



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