



A publication of the Caesar Kleberg Wildlife Research Institute  
at Texas A&M University-Kingsville

Summer 2018  
Volume 22, No. 2



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## USING DRONES TO SURVEY WHITETAILED IN SOUTH TEXAS

by Aaron Foley

Wildlife surveys are essential to estimate population sizes, which are needed for effective game management. Many large ranches in South Texas use helicopters to generate population estimates for white-tailed deer. For small ranches (those less than 2,000 acres), it may not be feasible to conduct surveys with helicopters. Thus, white-tailed deer

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population estimation methods may be limited to labor-intensive techniques such as spotlight counts or trail camera surveys.

Drones, or unmanned aerial vehicles (UAV), are emerging as an alternative method for surveying wildlife. However, it has yet to be determined whether drones are an effective tool for surveying deer in southern Texas rangelands.

My colleagues and I worked with 2 drone companies (Raptor Solutions and Sight Glass Flights) to evaluate the feasibility of drone surveys. Having a study area with a known number of deer would be a good starting point, so we conducted surveys in a series of 200-acre

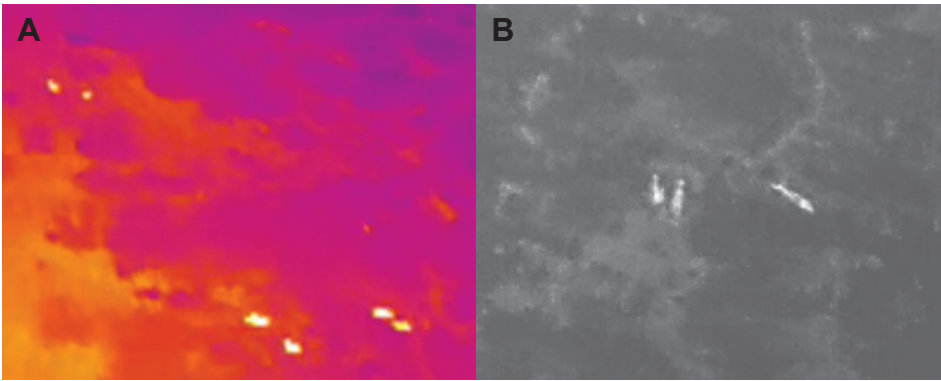
enclosures near Carrizo Springs, Texas. The enclosures are part of a long-term project where most of the deer have been ear-tagged. Population estimates were made by keeping track of individuals photographed during trail camera surveys; the number of deer present within an enclosure ranged from 39 to 140.

The first surveys were conducted with a drone equipped with an infrared camera. The surveys were conducted during morning hours in January during a cold snap (approximately 40°F). I mention the temperature because the colder the surrounding environment, the higher the contrast between the background temperature and a deer, thereby making the deer more noticeable in the video footage.

The second round of surveys was conducted during mid-February via a drone equipped with a thermal camera. Both daytime and nighttime surveys were conducted. Further, 4 enclosures were surveyed with

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(A) Screenshot of thermal nighttime footage with 6 deer detected and (B) screenshot of infrared footage with 3 deer detected.

an optical camera (a regular video camera). Temperatures during the second surveys were “normal” at approximately 70°F and the drones were flown at 130–150 feet above the ground.

Overall, both infrared and nighttime thermal had the highest counts relative to daytime thermal and optical. Infrared and nighttime thermal detected an average of 80% of deer present in enclosures. Although deer were under-counted, there was a trend of detecting more deer as deer density increased. Daytime thermal surveys showed promise (28% and 62%), but needs to be further evaluated since only 2 enclosures were surveyed. Optical footage detected the lowest percentage of estimated deer populations (1–6%).

Although white-tailed deer were the only large mammal in the enclosures, we wanted to further evaluate how well deer could be identified with nighttime thermal footage. This is critical because in free-ranging situations, there may be multiple large mammals such as livestock, collared peccaries, and other exotic species that can make it difficult to classify a detection. We reviewed the footage again and tallied the

number of detections that were clearly deer as indicated by body shape and gait. We found that our “confirmed” counts were about 70% (range 50–92%) of the estimated deer population sizes.

Overall, we found that optical appears to be limited because of the difficulty in seeing immobile deer. This may be due to the quietness of a drone compared to a loud helicopter. Drones could be flown at lower altitudes (50–60 feet) to increase reaction behavior of deer, but with tall mesquites and powerlines this could be problematic. Both infrared and thermal appeared to be promising as evidenced by the positive relationship between number of detections and deer densities. However, classifying a detection as white-tailed deer with 100% certainty was difficult at times and is an important consideration if surveying an area with different species.

Given that drones are continuously evolving in sophistication and can be equipped with various types of cameras and zoom lenses, the opportunity to establish a protocol for conducting drone-based white-tailed deer surveys appears to be very promising. ~

### New Endowment for Wildlife Research Established

We are pleased to announce the creation of the *Vannie E. Cook Endowment for Wildlife Research*. **Vannie E. Cook, Jr.** grew up in McAllen, Texas and was a prominent businessman and rancher who owned the Coca Cola Bottling Company in McAllen. In the 1960s, he purchased Las Islas Ranch in Starr County.



Vannie E. Cook, Jr., after which the new endowment was named.

Mr. Cook had a love for the outdoors and was dedicated to the conservation of the wildlife and natural resources found on the property. He left a legacy of land stewardship and a passion for conservation in South Texas that continues today through his children and grandchildren. We would like to thank **Kathy and Jim Collins** and the **Loring Cook Foundation** for this generous gift.

### New Endowment for Bobwhite Quail Research Established

We are pleased to announce the creation of the *Nancy Lee and Perry Bass Memorial Endowment for Bobwhite Quail Research* at the CKWRI.

**Mr. Bass** was a life-long conservationist and passionate outdoorsman, and he served



Nancy Lee and Perry Bass, after which the new endowment was named.

### By The Numbers

240–469 range of weights in pounds (109–213 kg) of a female nilgai (The Mammals of Texas, W.B. Davis and D.J. Schmidly, TPWD)

100–1,000 number of eggs laid by a female tarantula (A Field Guide to Spiders and Scorpions of Texas, J.A. Jackman, Taylor Trade Publishing)

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as chairman of the Texas Parks and Wildlife Commission. He and his wife of 65 years, **Nancy Lee Bass**, were generous philanthropists whose contributions supported education, the arts, conservation, healthcare, human services, and many other worthy causes. We thank the **Bass Family** for this amazing gift.

### Visit by *BirdNote* Executives

*BirdNote* Executive Director **Sallie Brodie** and Director of Development **Kate Godman** traveled to Kingsville to meet with CKWRI researcher **Dr. April Conkey** to award her a *BirdNote Next Generation Grant*. The grant will incorporate *BirdNote* stories, blogs, and podcasts into new lessons of our



**Dr. April Conkey** (left) with *BirdNote* Executive Director **Sallie Brodie** (center) and *BirdNote* Director of Development **Kate Godman** at the Caesar Kleberg Wildlife Center in Kingsville, Texas.

existing Wild Bird Conservation Curriculum that was created and evaluated by **Janel Ortiz** as part of her Ph.D. dissertation.

Ms. Brodie and Ms. Godman had lunch and talked with the CKWRI faculty and graduate students, and then toured the King Ranch with nature tour coordinator **Tom Langschied**. Teachers and environmental educators can register for our free summer Wild Bird Conservation Curriculum workshop offered July 9–10, 2018 by emailing [april.conkey@tamuk.edu](mailto:april.conkey@tamuk.edu). You can hear *BirdNote* podcasts Monday–Friday at 7:45am and 2:00pm on KEDT 90.3 FM, on your local NPR station, or at <https://birdnote.org/>.

## Did You Know?

The American beaver is a rodent, occurring within the taxonomic order Rodentia.

The king rail (*Rallus elegans*) is the largest member of the rail family (Rallidae). (Management of Migratory Shore and Upland Game Birds in North America, G. Sanderson, University of Nebraska Press)

### Graduate Student Recognized

**Jason Lombardi**, Ph.D. student working with **Dr. Michael Tewes** on wild cats, received the *William B. Davis Award* for best graduate student oral presentation in classical mammalogy at the 36th Annual Meeting of the Texas Society of Mammalogists, which was held February 16–18 at the Texas Tech University Llano River Field Station in Junction, Texas. Congratulations Jason for being recognized for your hard work. ~



Graduate student **Jason Lombardi** (left) being awarded for his presentation by **Dr. Richard Stevens** president-elect of the Texas Society of Mammalogists.

with Texas Parks and Wildlife, we have been conducting Rio Grande wild turkey research in South Texas for the past 5 years, and more recently Rio Grande and Eastern wild turkey research near Mineral Wells and Paris, Texas, respectively. Several cooperators are making this research possible, including Las Huellas, Charlie Hoffman (HC30 Ranch), Renato Ramirez (El Veleno Ranch), Texas Military Department, the Bass Ranches, Benny Martinez and Homero Vera (Kenedy Ranch), Stuart Stedman (Faith Ranch), and the Tom Frost Endowment for Rio Grande Wild Turkey Research.

The South Texas study began in 2015 to determine if constructed roosts (artificial roosts) could serve as alternatives to natural roosts (live oak and hackberry trees) where these natural roosts are limited. Our objectives are to determine (1) if turkeys will use constructed roosts and (2) what vegetation characteristics surrounding roosts are preferred. In addition, we have started another study to further evaluate the landscape characteristics that result in turkeys using artificial roosts. In this study, our objective is to determine where on a South Texas landscape to build roosts that will increase the probability that wild turkeys will use them.

Preliminary findings, based on habitat data collected at 87 constructed roosts in 2016 and 28 roosts in 2018, indicated that about 35 to 40% of the constructed roosts were used by turkeys. Proximity to water and a stable roosting platform accommodating multiple turkeys were important determinants. Specific habitat features that might

### THE CKWRI WILD TURKEY PROJECT

by *William P. Kuvlesky, Jr.*,  
*J. Alfonso Ortega-Santos*, and  
*Humberto L. Perotto-Baldivieso*

Wild turkeys are important members of the wildlife community inhabiting the rangelands and forests of Texas. Turkeys also are popular gamebirds in Texas. In cooperation

Editor's Note: Drs. William Kuvlesky, Jr., J. Alfonso Ortega-Santos, and Humberto L. Perotto-Baldivieso are research scientists at CKWRI and hold joint appointments: Dr. Kuvlesky is assistant dean of the Dick and Mary Lewis Kleberg College of Agriculture, Natural Resources and Human Sciences; Dr. Ortega-Santos is professor and Dr. Perotto-Baldivieso is assistant professor in the Department of Animal, Rangeland, and Wildlife Sciences at Texas A&M University-Kingsville.

be important to turkeys at roost sites were not apparent, although additional statistical analyses may reveal habitat features associated with use of constructed roosts. Based on our findings, we have established that wild turkeys will use constructed roosts, although it appears roost use may be variable at times.

Wild turkey disease research has not been studied in South Texas for over 35 years. Since we capture almost 100 wild turkeys every winter, we decided to conduct a disease survey beginning in 2016. Blood samples were obtained from 126 wild turkeys from 2 study sites and screened for the avian influenza virus, mycoplasma, and salmonella.

We found all samples were negative for avian influenza virus and salmonella. However, almost 40% of the birds tested positive for mycoplasma antibodies indicating their exposure to the pathogen. This is not too surprising because mycoplasma is a common disease in wild turkeys.

**Advisory Board**

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

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**Wild turkeys using a constructed roost on a ranch north of Freer, Texas.**

The disease surveillance project will continue in 2018, and screening will be conducted for specific strains of these 3 pathogens.

We also initiated a project in 2016 designed to yield a survey method that will provide density estimates for Rio Grande and Eastern wild turkeys. This study is being conducted on Fort Wolters (Rio Grandes), near Mineral Wells and on Camp Maxie (Easterns), near Paris. Road surveys, point counts, and roost surveys are the 3 techniques being evaluated.

Preliminary results appear to indicate that roost count surveys may not be a viable technique on the 2 study sites. Another objective of this project is to identify specific vegetation communities on study site landscapes that are preferred by wild turkeys so that surveys can be concentrated in these vegetation communities. Fieldwork for this project will continue during the winter and spring of 2018–2019. ~

### What Do They Eat?

Texas night snakes mainly consume lizards and small snakes, but will eat "...lizard eggs, frogs, insects, and worms..." (Texas Snakes: Identification, Distribution, and Natural History, J.E. Werler and J.R. Dixon, University of Texas Press)

House wrens feed predominately on invertebrates such as bugs, moths, caterpillars, grasshoppers, beetles, ants, and spiders. (<https://birdsna.org/Species-Account/bna/species/houwre/foodhabits#diet>)

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Editor: Alan Fedynich, Ph.D.

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