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## POPULATION-LEVEL IMPACTS OF CHRONIC WASTING DISEASE

by David Hewitt

Chronic wasting disease (CWD) is a malady of the deer family. It is caused by a natural protein in the deer's body called a prion protein. Prion proteins can misfold, giving the protein a different conformation that makes it resistant to being broken down by the body's natural

processes. Because these abnormal proteins are not metabolized, they accumulate. Furthermore, the misfolded proteins can cause normal versions of the protein to misfold, setting off a chain reaction. Problems develop in the deer's brain because the abnormal proteins accumulate to the point they disrupt nervous-system function. Deer so afflicted lose coordination, become listless, lose body weight, and eventually die.

The fact that CWD is fatal to deer is well established. What is not clear is what the disease means for deer populations. Chronic wasting disease has the potential to cause

problems at the population level for 2 reasons. First, a misfolded prion protein is contagious, meaning it can be passed from one animal to another through feces, urine, and other bodily fluids causing other animals to develop CWD. Second, the configuration of the misfolded protein makes it resistant to environmental degradation, so that a prion can remain in the environment for years, maybe decades.

Although CWD was first reported in the 1960s and first identified as a prion disease in the 1970s, determining if the disease could cause a decline in deer populations has been difficult for several reasons. First, survey techniques for deer populations are not precise, so many years of surveys are often necessary to detect changes. Second, deer populations are influenced by many natural and human-caused factors other than CWD, making it difficult to understand the primary cause of a population decline. Finally, CWD is

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Editor's Note: Dr. David Hewitt is the Leroy G. Denman, Jr. Endowed Director of Wildlife Research at the Caesar Kleberg Wildlife Research Institute at Texas A&M University-Kingsville.

## By The Numbers

2 average number of eggs in a clutch (1–3) of a white-tailed hawk (Handbook of Birds of the World, Vol. 2, del Hoyo et al., Lynx Edicions)

6–10 average length range in inches of the blue spiny lizard (Guide and Reference to the Crocodilians, Turtles, and Lizards of Eastern and Central North America North of Mexico, R.D. Bartlett and P.P. Bartlett, University Press of Florida)

a disease that takes years to develop in a deer and decades to have a significant effect on deer populations.

Three studies have been published recently from central Colorado and southeast Wyoming, the area where CWD was first documented in wild deer.

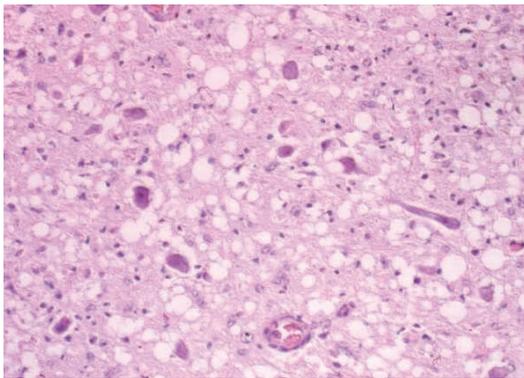
All 3 studies measured survival and reproduction of deer with CWD and deer without detectable CWD. Survival of CWD-positive deer was 20–40% lower than CWD-negative deer. Interestingly, no difference was noted in

reproductive rates as a result of CWD status. Two of the studies had good population monitoring programs that showed declines in population size of 40–50% in the past 10–20 years. Finally, authors in all 3 studies used reproductive rates and mortality rates to calculate annual changes in population size as a result of CWD. Populations with CWD declined 3–20% per year, but would have been stable or increasing without CWD.

A 4th study from north central Colorado paints a different picture. Whereas CWD prevalence varied between 20% and 42% in the first 3 studies, CWD prevalence was less than 10% and appeared to have declined since the late 1990s. While CWD was contributing to declines in deer populations in portions of this

study site, the overall picture was of a population that had stabilized. The bad news was that hunter harvest had to be curtailed to enable the population to stabilize.

What do these studies mean for CWD management in Texas?



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A photomicrograph of brain tissue from a deer with CWD; the numerous abnormal vacuoles or “holes” (appearing as light pink-to-white color) throughout the brain tissue cause the condition described as spongiform encephalopathy.

study site, the overall picture was of a population that had stabilized. The bad news was that hunter harvest had to be curtailed to enable the population to stabilize. What do these studies mean for CWD management in Texas? First, CWD can cause dramatic declines in deer populations, but the effects may take 25 or more years to be apparent. Second, the population-level effects of the disease may vary geographically, so monitoring and research will be important to understand the effects of CWD on deer populations in Texas. Finally, CWD will impact deer management in Texas.

An immediate change in deer management practices that managers may choose to implement is to cease baiting, supplemental feeding, and transporting deer. These changes will reduce CWD transmission and geographic spread. In the longer term, deer harvest may be curtailed because of the lower survival imposed by CWD.

Texas is at the beginning of a long, uncertain journey. Learning from areas where CWD has been present for a long time will be essential to protecting the wildlife resource we all treasure. ~

## CKWRI NEWS

### CKWRI Shines at the 53rd TCTWS Annual Meeting

The students and scientists of the CKWRI played a major role at the 53rd annual meeting of the Texas Chapter of The Wildlife Society (TCTWS) held February 16–18 in San Antonio, TX.

**Dr. Randy DeYoung**, president of the TCTWS, presided over the meeting and turned over the reins to incoming president **Corey Mason** (Texas Parks and Wildlife) at the conclusion of the awards ceremony.

Thirty-two of 109 (29%) oral presentations of research and 35 of 94 (37%) poster presentations were authored or coauthored by CKWRI researchers, graduate students, and undergraduate students working with CKWRI researchers.

**Michaela Rice** and **Emily Wells** placed 2nd and 3rd, respectively, in the graduate student poster competition. Michaela’s presentation “Recruitment Patterns of White-tailed Deer in a Variable Environment: Waiting for Rain” was coauthored by graduate student **Kory Gann**, **Drs. Randy DeYoung**, **David Hewitt**, and **Aaron Foley** (from the CKWRI), and **Drs. Alfonso Ortega-S. Jr.** and **Tyler Campbell** (East Foundation). Emily’s presentation “Wintering Sandhill Crane Habitat Selection along the Texas Gulf Coast” was coauthored by **Drs. Bart Ballard** and **Humberto L. Perotto-Baldivieso** (CKWRI),



Mandy Krause, TCTWS

**Michaela Rice** being congratulated by outgoing TCTWS president **Dr. Randy DeYoung** for receiving 2nd place in the graduate student poster competition.



Mandy Krause, TCTWS

Emily Wells being congratulated by outgoing TCTWS president Dr. Randy DeYoung for receiving 3rd place in the graduate student poster competition.

Shaun Oldenburger (Texas Parks and Wildlife), Daniel Collins (U.S. Fish and Wildlife Service), and David A. Brandt and Aaron Pearse (U.S. Geological Survey).

TAMUK undergrad Travis Dillard placed 3rd in the undergraduate poster competition. Travis’s presentation “Efficacy of Mint-scented



Mandy Krause, TCTWS

Travis Dillard being congratulated by outgoing TCTWS president Dr. Randy DeYoung for receiving 3rd place in the undergraduate student poster competition.

Spray to Repel Rodents” was coauthored by undergraduate Zachary Naegelin and Dr. Scott Henke (CKWRI).

Receiving the Best Scientific Article Award was Drs. Damon Williford, Randy DeYoung, Leonard Brennan, Fidel Hernández (CKWRI), and Rodney Honeycutt (Pepperdine University) for “Phylogeography of the Bobwhite (Colinus) Quails,” which appeared in

Wildlife Monographs Volume 193, Issue 1, January 2016, published by The Wildlife Society.

Receiving the Student Chapter of the Year Award was TAMUK’s Wildlife Club, which has been shepherded by Dr. Scott Henke for the past 21 years (see the Fall 2016



Mandy Krause, TCTWS

Drs. Leonard Brennan, Randy DeYoung, and Damon Williford (L to R) received the Best Scientific Article Award.

issue of the CKWRI newsletter for a detailed overview of Scott’s success in working with this campus organization). We congratulate our faculty and students in representing the CKWRI at the annual meeting of the TCTWS and being recognized for their hard work. ~

### EVOLUTION OF PERSPECTIVE ON THE OCELOT

by Michael Tewes

The ocelot was officially listed as an endangered species in the United States during 1982. That

Editor’s Note: Dr. Michael Tewes holds the Frank Daniel Yturria Endowed Chair for Wild Cat Studies at the CKWRI and is a Regents Professor at Texas A&M University-Kingsville.

year also marked when I captured the first ocelot and began working on this beautiful feline. I have been engaged in research and conservation of the ocelot ever since.

One of the most frequent questions that I receive is “How are the ocelots doing—are they increasing or decreasing?” Enough pieces of the puzzle have finally come together for me to see a clearer picture. My opinion is the population size of ocelots in Texas is likely similar today as it was in 1982; however, their vulnerability has significantly increased over the same period.

We have found the existence of 2 small populations of ocelots in Texas. The “Cameron ocelot population” occurs in the far-eastern fringe of Cameron County—the southernmost county in Texas. Over the past 3 decades, we have found that alarmingly only about 12 to 15 ocelots use the tiny patches of ocelot habitat, mostly on the northern portion of Laguna Atascosa National Wildlife Refuge. These ocelots have been confined mainly to this area where they have experienced inbreeding, and several have been killed in vehicle collisions when attempting to leave the refuge.

The area surrounding the Cameron population is mostly an inhospitable landscape. If an ocelot disperses from the refuge, then it must traverse through a gauntlet of threats including a dense road network, open agricultural fields and coastal prairies with little protective cover from coyotes, bobcats, and humans. Home sites scattered over this area also are the sources of lethal encounters with domestic dogs and disease-bearing house cats.

### Did You Know?

The nine-banded armadillo is thought to be monogamous during the annual breeding season. (The Mammals of Texas - Online Edition, W.B. Davis and D.J. Schmidly, Texas Tech University)

Wetlands are considered to be among the most productive habitats on earth, providing habitat for fish and shellfish and wintering areas for migrating birds. (https://www.nwrc.usgs.gov/wetlands.htm)

Visit our web page at <http://www.ckwri.tamuk.edu>

Having viewed little change over the past 35 years, I can easily envision that the Cameron population will continue to remain at a dangerously low level into the foreseeable future. This future includes any modest attempts in habitat restoration, construction of road crossings to reduce mortality, and other interventions. The fundamental problem is the existing habitat is severely restricted, and this isolation will increase with the expanding developments destined for the landscapes around the Cameron population.

The 2nd group of ocelots is represented by the “Willacy population” occurring on private ranches. Several pieces of the puzzle have come together after access was permitted by the Yturria Ranch and the East El Sauz Ranch. I believe this cluster of ocelots in and around northern Willacy County represents at least 80% of the total population in Texas, which is believed to be fewer than 80 ocelots.

**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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The habitat coverage is greater for the Willacy population, and perhaps as important is that the areas between the habitat patches consist of native rangeland. This natural cover is much preferred over agricultural fields and housing developments that confine the Cameron population. In addition, the Willacy population has fewer public roads occurring outside the ranch boundaries, another reason to be optimistic for this group of felines.

Here is another “evolved conclusion” after 35 years of experience: “Sightings are just wrong...” The

first 10 years into my ocelot journey, I often believed, or more realistically “hoped,” that some of the reports of ocelot sightings that I received would be correct. The last 25 years have led me to conclude that 99% of sightings of ocelots, jaguarundis, and mountain lions are simply wrong.

An overwhelming percentage of sightings of ocelots are actually not ocelots. They usually represent heavily spotted bobcats, house cats, feral cats, Bengal cats, oicats, and other beasts. Sightings by biologists may be slightly better, yet I have still found an extremely high level of error. Any decisions based on “sightings” or “observations” by the public and by biologists should be avoided—they will usually lead to a bad outcome. ~

**What Do They Eat?**

The loggerhead turtle has an omnivorous diet, eating turtle grasses, shellfish, crustaceans, fish, and various other marine organisms. (A Field Guide to Texas Reptiles and Amphibians, R.D. Bartlett and P.P. Bartlett, Gulf Publishing Co.)

The bronzed cowbird is primarily a granivore, but is known to consume various insects, spiders, and snails. (Handbook of Birds of the World, Vol. 16, del Hoyo et al., Lynx Edicions)

**Consider giving a tax-deductible donation to CKWRI**



Caesar Kleberg Wildlife Research Institute  
700 University Boulevard  
MSC 218  
Kingsville, Texas 78363-8202

Editor: Alan Fedynich, Ph.D.

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