

CAESAR KLEBERG Tracks

=====*A Publication of the Caesar Kleberg Wildlife Research Institute*=====



CAESAR  KLEBERG
WILDLIFE RESEARCH INSTITUTE
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TEXAS A&M UNIVERSITY - KINGSVILLE®

CAESAR KLEBERG *racks*

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The Caesar Kleberg Wildlife Research Institute at Texas A&M University-Kingsville is a Master's and Ph.D. Program and is the leading wildlife research organization in Texas and one of the finest in the nation. Established in 1981 by a grant from the Caesar Kleberg Foundation for Wildlife Conservation, its mission is to provide science-based information for enhancing the conservation and management of Texas wildlife.



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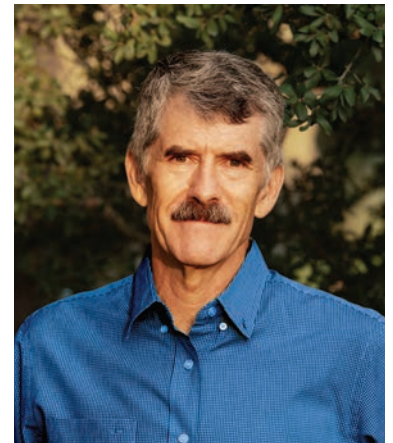
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FROM THE DIRECTOR

Why I am Bullish on Conservation in Texas

There are many threats to wildlife and rangelands in Texas and it is easy to get overwhelmed by the challenges. This edition of *Caesar Kleberg Tracks* magazine highlights many reasons that we should be optimistic. For example, landowner observations suggest mountain lion numbers may be increasing in South Texas, a region where concern over the species' status has persisted for decades. A dedicated team of landowners, students, scientists, and agencies has coalesced to learn more about mountain lions living along the Rio Grande. This knowledge will not only raise awareness but help land stewards manage these large and influential predators.



This issue also has an article about another predator, one that causes fear in insects instead of deer, javelina, and pigs. Spot-tailed earless lizards are a cryptic species in South Texas and Dr. Scott Henke describes the challenges he experienced in studying them. His work and that of his students has established the range of the two species of spot-tailed earless lizards in South Texas and where their populations are struggling. As a result of this research, one species of spot-tailed earless lizard will not be listed as a threatened species. This is a positive outcome for the species, because it means land stewards can continue their current management and perhaps do some new things to conserve the species before its populations become critical.

Further down the food chain are white-tailed deer, a species that has received a large amount of research attention. As a result of all this research, biologists managing the species have many management tools available. However, some of these tools were developed over 50 years ago and some were developed in other portions of the species' range. It is not clear they are the best tools available and whether they work as well here as in the locations they were developed. To further refine techniques, or at least provide a clear-eyed view on their accuracy, CKWRI scientists are constantly evaluating and seeking to improve management techniques. In this edition of *Tracks*, Drs. Randy DeYoung and Aaron Foley evaluate some of the environmental factors thought to influence deer aging techniques.

At the base of the food chain, Texas Native Seeds has been successful working with agencies and private companies to promote grassland restoration on areas disturbed by construction or other activities. In doing so, the affected areas recover quickly with a suite of native grass species that will maintain the lands' ecological function. Maintaining ecological function benefits all animals, from insects to cougars, and helps ensure those lands continue to meet our needs as well.

While these stories demonstrate how CKWRI's work is a bright spot in the conservation of Texas rangelands and wildlife, the brightest spots are highlighted by the last 2 articles in this *Tracks* magazine. The story on Sue and Radcliffe Killam is heartwarming in demonstrating how Texans care about the land and wildlife. Sue and Radcliffe Killam made wildlife a part of their management interests and that approach has been passed to their kids, grandkids, and now to their great grandkids. Love of the land is a trait of Texans that gives us hope for the future of wildlife.

The final article shows another way CKWRI is influencing wildlife conservation in Texas and across the country. Joe Holbrook earned his master's degree at CKWRI studying mountain lions. His work was the basis of some of the concerns about mountain lion populations in South Texas that spurred the current mountain lion project. Joe is now a successful professor and scientist in Wyoming, conducting research to support conservation of a variety of carnivores in the Rocky Mountains.

So, you can see how applied research and committed people make me bullish on wildlife and rangeland conservation in Texas. There are many challenges, but with the right knowledge and committed people, I am certain we will pass on a legacy of love and service to the natural world that will enable our kids and grandkids to enjoy the outdoors as much as we have.

All the best,

A handwritten signature in black ink that reads "David Hewitt".

Dr. David Hewitt

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

TECHNIQUES FOR AGING DEER AREN'T AGING WELL



*by Randy W. DeYoung
and Aaron M. Foley*

Deer antler and body size change with age, so management plans specify which age classes of deer are eligible for harvest. Harvested deer are typically aged based on patterns of tooth wear and replacement. Young deer, like young humans, have baby teeth that are replaced by adult teeth at predictable intervals. We can accurately assign a deer's age up to 2 years old, when their 3rd premolar tooth is lost and replaced with an adult tooth. For deer 2.5 years old and older, we estimate age based on how worn the teeth are. Plant nutrients are difficult to extract, and ruminants, like deer, spend much of their time regurgitating and re-chewing their food. Over the years, the constant chewing wears down the teeth.

The tooth wear method is widely used because it's relatively easy to learn, cost-effective, and fast. Occasionally, biologists will use a method based on cementum annuli for aging, which is less subjective than tooth wear. The goal is to count annuli in the root of the tooth, which are like growth rings in a tree. The method requires pulling a tooth, usually an incisor, taking care to keep the entire root intact. The tooth is dried, treated to remove the calcium, sliced, stained, and viewed under a microscope. Due to the preparation required, the cementum ages are usually done by a commercial lab. The cementum method is most commonly used for predators, such as bears or mountain lions, where tooth wear is less predictable.

Both methods have been used and taught for decades. Surprisingly, however, there have been few formal evaluations of the techniques. This is probably due to the time and difficulty of getting a large sample of wild, known-age animals. Regardless, there are many untested theories about aging techniques. For instance, many biologists believe that deer living in sandy soils wear their teeth down faster due to the extra abrasion by sand particles on the food. Many also believe that

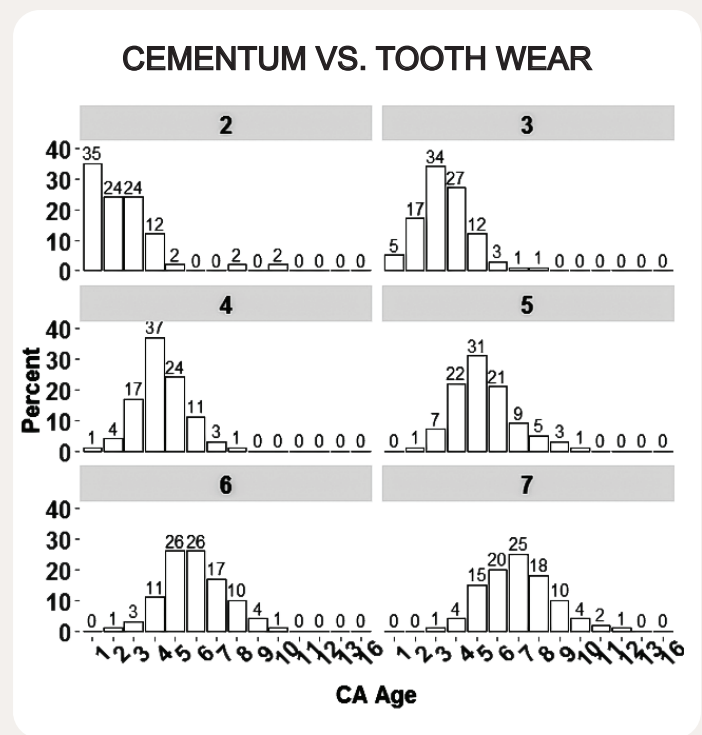


Figure 1. Harvested deer aged from 2 to 7 years old by both cementum annuli and tooth wear, showing the percent agreement between cementum and tooth wear for each age class. The distribution of ages emphasizes the amount of variability among deer for both tooth wear and cementum annuli. For instance, 35% of males aged as 2 years old via tooth wear were aged as 1 year old via cementum annuli.

deer with access to supplemental feed wear their teeth down slower because the feed is softer and requires less chewing. Finally, the cementum annuli method is thought to be less accurate in areas without distinct seasons, such as South Texas.

Beginning in 1998, a team of CKWRI scientists and partners set out to evaluate both aging methods and perform any myth-busting or myth-confirmation. From 1998 to 2007, scientists Mickey Hellickson, David Hewitt, and graduate student John Lewis led a team that captured and tagged hundreds of deer on 5 South Texas ranches. The effort resulted in 134 known-age deer. Graduate student Oscar Cortez worked with Aaron Foley to compare tooth wear ages to cementum ages for 5,117 deer harvested on the 4 divisions of the King Ranch during 2000 to 2015. Combined, this was one of the most extensive evaluations of the 2 techniques ever completed.

EFFECTS OF SAND ON TOOTH WEAR

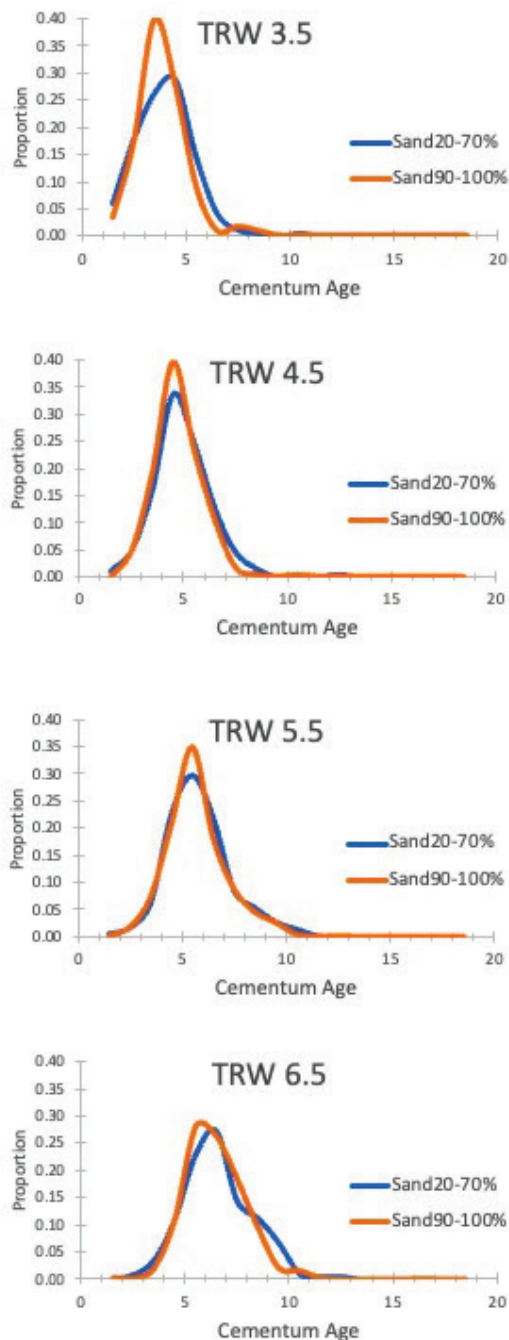
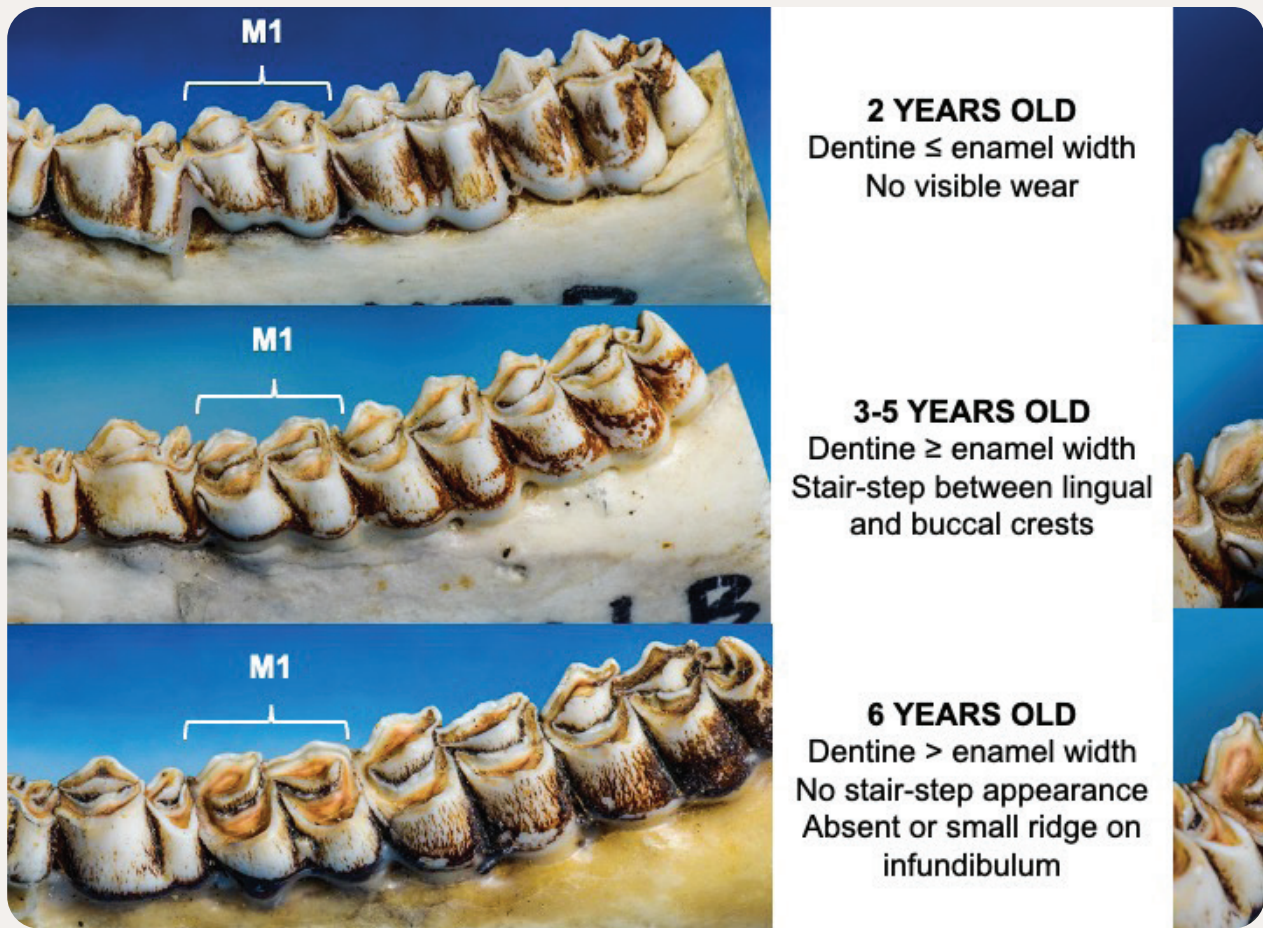


Figure 2. Harvested deer aged by both tooth replacement and wear (TRW) and cementum annuli from portions of King Ranch with sandy and loamy soils. Because cementum is not affected by soil, if sand caused more tooth wear, we should see a trend for tooth wear ages to be greater than cementum ages that becomes more pronounced in older deer.

The study revealed that sand or feed had little influence on age estimates. In part, this was because of extensive variation in tooth wear among deer of the same age. However, some digging into the scientific literature revealed that the oft-repeated idea that sand particles in the food caused more tooth wear was flawed. Deer, like all ruminants, will take bites of forage and swallow them whole. They later regurgitate and chew the food at their leisure. Therefore, any grit on the food would be rinsed off in the rumen prior to chewing. This was truly a head-smacking revelation. Why hadn't we thought of this or seen the paper? No one noticed in part because the study was done by archaeologists, not biologists, and instead of "tooth wear" they used the term "dental microabrasion." Nonetheless, in a series of well-designed studies, these archaeologists fed food with grit to captive goats and evaluated tooth wear in a quest to better understand how climate changes may have affected ancient plant-eaters. The lack of a feed effect is likely because deer with access to feed still eat vegetation, and in fact usually eat lower-quality vegetation to moderate the speed of microbial fermentation in the rumen.

We found that both methods were within +/- 1 year of the true age about 90% of the time. Both tooth wear and cementum annuli tended to underestimate ages of older deer, whereas tooth wear also tended to overestimate ages of young deer. Cementum annuli performed better on deer >6 years old, when the tooth wear patterns become more variable among deer. The original guide to aging by tooth wear developed by C. W. Severinghaus in 1949 had a detailed set of tooth characters to memorize and evaluate for deer aged 1 to 10 years old. Our team found much of this detail was unnecessary – there was so little consistency in tooth wear patterns between deer of the same age. For instance, deer often have more wear on one side of the jaw, probably due to a tendency to chew more on that side. These differences become more pronounced as the deer



2 YEARS OLD
Dentine ≤ enamel width
No visible wear

3-5 YEARS OLD
Dentine ≥ enamel width
Stair-step between lingual
and buccal crests

6 YEARS OLD
Dentine > enamel width
No stair-step appearance
Absent or small ridge on
infundibulum

ages, adding to the inconsistency. We developed a simplified aging guide that only requires examining 2 teeth: the 3rd pre-molar and the 1st molar. The former is replaced by an adult tooth at about two years of age and is a perfect indicator of a deer less than 2 years old. Based on tooth wear, our modified method categorized deer into age classes of 2, 3–5 and 6+ years of age with about 70% accuracy, a big improvement over Severinghaus. The cementum method performed well even in the South Texas environment. In fact, the cementum results revealed that there were many more old deer than we suspected. Many hunters believed they were harvesting deer at 5–7 years old based on tooth wear. However, cementum annuli revealed that about 30% of these were over 8 years old, with a few up to 16 years!

Figure 3. Aging guide using simplified tooth-wear criteria for white-tailed deer that pools adults into three age classes: 2, 3–5, and ≥6 years old. Photos by Brian Loflin

The biggest obstacle to accurate ages is simply the deer. Some deer have good teeth and some have bad teeth, just like people. We are not likely to have a better method of aging, short of tagging young deer. If applied consistently, tooth wear is plenty good for management purposes, even if it's less than 100% accurate. The only time we know the exact age of a deer is after it is harvested, when it is as old as it's gonna get. 🐾

ADDITIONAL READING

Learn more by scanning the QR codes for access to CKWRI's scientific paper and the original Severinghaus paper.



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THE *Ghost Cat* OF TEXAS

How Mountain Lions
are Navigating Life in a
Transboundary Region

*by Katie McDaniel, Chloe Nouzille,
Lisanne Petracca, and Michael Cherry*



Some of Texas' most beloved flora and fauna have risen to the challenge of calling South Texas home. The enigmatic mountain lion is no exception, clawing out a living along the Rio Grande. Mountain lions are known by many names, including cougars, pumas, catamounts, and screamers, but all refer to the same tawny-colored big cat taxonomically referred to as *Puma concolor*.

Mountain lions are the second-largest wild felid in North America, second only to jaguars. On average, they weigh anywhere from 70-165 pounds, with lean bodies and long, black-tipped tails. As a top predator, they play crucial roles in their ecosystems, helping to maintain balance among trophic levels. Historically, mountain lions roamed most of North and South America. Today, due to fragmentation, habitat loss, and overharvesting, their distribution is significantly smaller. In North America, our South Texas population is the easternmost established lion population apart from the federally endangered subspecies, the Florida panther.



The project's second successfully captured cat, P02, safely collared and returning to roam the brush country.



Pictured is the 3rd successfully captured cat, a 75-pound, 2 1/2 year old female known as P03. MS student, Katie McDaniel, fits P03, with a GPS collar and studies P03's teeth, which are used to estimate age.

In the Lone Star State, lions are predominately found in one of two populations: South Texas and West Texas. Statewide, the species is classified as non-game and largely left unmanaged. Hunting is allowed year-round with no bag limit and harvest reporting is optional. In fact, Texas is the only state in the country with breeding populations of mountain lions that are unmanaged. Mountain lions, and the wildness they represent, hold great significance to many Texans. Recently, there have been many calls for Texas to manage this resource in a manner that can allow mountain lions to persist for generations to come. Texas Parks and Wildlife Department formed the Mountain Lion Stakeholder Group, bringing together a diverse mix of ranchers, sportsmen, and wildlife professionals to address key questions and concerns about lion populations across the state.

The group's findings highlighted a critical lack of information about Texas mountain lions, particularly in South Texas, where no formal studies have been conducted in over 20 years. In light of these findings, Texas Parks and Wildlife Department has instituted new measures, such as banning "canned" hunting and implementing time checks for trapping, intended to reflect a commitment to Texas' time-honored tradition of ethical and informed hunting practices. Further steps towards lion management, however, will require more research.

To address the present knowledge gaps, researchers at the Caesar Kleberg Wildlife Research Institute at Texas A&M University – Kingsville have launched the South Texas Lion Project. The team, headed by Dr. Lisanne Petracca of the Spatial Population and Ecology of Carnivores Lab, is celebrating the one-year anniversary of the project this fall, along with close collaborators from the United States Fish and Wildlife Service, Texas Parks and Wildlife Department, and private landowners. The South Texas Lion Project is pursuing broad research objectives, including assessments of population density and abundance, how lions move, what they eat, and how habitat connectivity has affected gene flow. Field operations are currently focused on estimating mountain lion distribution from Val Verde and Cameron County, with hopes to continue growing the project with time and increased support.

Methods to understand how many lions there are and where they are located rely heavily on GPS collars and

game cameras. The project's field team began capture efforts in February 2024 and has successfully added three mountain lions to the study. All three cats were safely fit with GPS collars, the first-ever placed on South Texas lions. In addition to their GPS collars, captured individuals are also given unique ear tags and an identifying moniker. P01 ("P" for puma), our first cat, was a 118-pound, three-year-old male; P02, a 116-pound, one-and-a-half-year-old male; and P03, a 75-pound, two-and-a-half-year-old female. All cats are currently contributing cutting-edge movement data to the study. GPS data can also be used to calculate home range size (110,000 – 163,000 acres for our collared males), elucidate diet behavior, and define travel corridors. Researchers have also deployed over 200 remote trail cameras, conducted 50 kill site investigations, and collected 35 genetic samples from Texas and New Mexico.

Diet investigations have so far revealed deer as the most popular prey item for our collared lions. Additionally, P01 has also depredated coyotes, feral hogs, raccoons, and what we can only assume was a quick snack: a rat. Down the road, our PhD student, Chloe Nouzille, plans to pursue DNA analysis on lion scat to create a more complete understanding of mountain lion diets in South Texas.

Progress to define genetic relatedness between neighboring mountain lion populations has quickly spread beyond the state of Texas, expanding our scope to potentially show how lions in Texas are related to those in New Mexico, Arizona, and across the Rio Grande in Mexico. Importantly, this work will also allow us to understand the genetics of the lion population that represents the leading front of eastern recolonization. Katie McDaniel, the master's student on the project, hopes to use genomic analysis to elucidate lion gene flow patterns through time and space. Additionally, she is pursuing questions qualifying levels of genetic isolation and inbreeding in the South Texas lion population.

The South Texas Lion Project is growing rapidly, and our research would not be possible without the aid of our collaborators and private landowners. Our scientific findings have the potential to impact state, federal, and international wildlife management and preserve an iconic predator for future generations of Texans to enjoy. 🐾



*Top/middle photos: An unidentified mountain lion making his or her way through a creek bed in South Texas.
Bottom photo: Lion cache site of a depredated deer.
Lions typically cache larger prey items and eat them over several days.*

HURDLES OF A WILDLIFE BIOLOGIST: Tale of the Spot-tailed Earless Lizard

by Scott E. Henke



I received a grant from the Texas Comptroller of Public Accounts Office to determine best survey practices to assess the population of spot-tailed earless lizards in Texas. I knew from the beginning this would be a challenging research project because I have lived in southern Texas for the past 30 years, and in all that time I have not seen even one spot-tailed earless lizard. So, my first hurdle in this venture was to find where spot-tailed earless lizards, or STEL for short, have been found in the past. I looked up past research articles for locations and checked the interactive website, iNaturalist, to see where STEL were found in the distant and more recent past. By doing this, I was able to make a map of locations where it seemed to offer the best opportunities to find STEL.

The majority of Texas is privately owned (i.e., ~97%), therefore, all the places that I located where STEL were found in the past occurred on private land. This brought me to my second hurdle: I needed access to private property. Having been a wildlife researcher in Texas for 30 years, gaining access to private property is a normal aspect of conducting research. So, I began investigating who owned the properties I was interested in, and to obtain their contact information. I typically first call the person to introduce myself and request if we could meet face-to-face to hear my proposition. I have had better success with face-to-face meetings than just 'cold' phone calls. If the property owner agrees to meet with me, I usually bring coffee and some type of pastry treat as an ice breaker. After all, as researchers we are asking to be a guest on their property, and as a guest, I want to be polite and bring offerings.

One particular gentleman still stands out in my mind during my many attempts to gain property access. His name was Larry and he invited me into his house where we sat at his kitchen table drinking the coffee and eating the pastries I brought. After some small talk, I explained my research project with the spot-tailed earless lizards and how I was requesting access to his farmland. Before I could get my entire rehearsed speech out, Larry cut me off and said "Did Leonard put you up to this? He's trying to see if I'm gullible, isn't he?" I said, "No sir, I don't believe I know Leonard." Larry said, "So, you're telling me your looking for 'earless' lizards? Son, I've lived in southern Texas for over 70 years and I have never seen lizards with ears! So, you're just wanting to find normal lizards?" I then went into an explanation where STEL are called 'earless lizards' because this particular species lacks an external auditory canal; however, they do possess the internal ear structure that is found in other lizards. The lack of an external auditory canal is thought to have evolved as a result of the burying behavior characteristic to the group of lizards known as "Sand Lizards", in which STEL are grouped.

Well Larry seemed to accept this explanation for the term 'earless' and my role in a conspiracy with Leonard was dropped.

*Left: Male Tamaulipan STEL climbing a fence post, presumably to locate female mates.
Photo by Drake Rangel*



Tamaulipan and Plateau STEL side by side in captivity as a comparison of different colorations. The Plateau STEL is a caramel brown color, while the Tamaulipan STEL is a slate gray color. Photo by Drake Rangel



Female Plateau STEL in reproductive colors to attract mates. Photo by Drake Rangel

have declined substantially within the United States, with a few disjunct populations occurring. Hence, their decline resulted in The WildEarth Guardians, a nonprofit environmental organization that advocates for wildlife and wild places, petitioning for federal protection of STEL under the Endangered Species Act.

Often, after a landowner hears about the potential of a federally listed threatened and endangered species, they become leery of research projects for fear that the federal government will show up one day at their front door and tell them what they can and can't do on their property. However, that wasn't the case with Larry. He agreed that I could search his property.

However, this led me to my third, and often the most difficult of hurdles when requesting access to private property. I had to explain to Larry that STEL are being considered by the United States Fish and Wildlife Service (USFWS) as a potential federally listed threatened species.

Originally, STEL were considered a Great Plains prairie species whose range extended northward to Comanche County, Oklahoma, across central and southern Texas, and into the Mexican states of Coahuila, Nuevo Leon, and Tamaulipas. Initially STEL were considered a single species with two variations or subspecies (i.e., Plateau and Tamaulipan STEL). However, in recent years the two variations have been elevated from subspecies status to full species status. Geographically, these two species are split along the Balcones Escarpment, which is located in south-central Texas within the South Texas Plains ecoregion, with Plateau STEL to the north and Tamaulipan STEL to the south. Today, the population numbers and distributions of both species



Plateau STEL carrying a telemetry transmitter so researchers can follow its movements. Photo by Drake Rangel

Author Scott Henke and Texas rancher, David O. Gonzalez, enjoying some coffee while discussing the potential use of his ranch in Duval County as a site for research.



In fact, many landowners smiled and laughed when they heard that I would be spending my summers in search of a small lizard. Typical reaction was, “Well good luck with that,” and they would leave shaking their head. I guess the thought of a grown man chasing a small reptile instead of a deer or quail was funny. There were a few landowners, however, that became apprehensive when they heard about the third hurdle. I guess the idea of the government potentially showing up one day scared them, or perhaps I brought the wrong type of pastries, but for whatever reason, they declined to have research conducted on their property. Nevertheless, when it was all said and done, I was able to locate and gain access to enough private properties to make the project successful.

In the end, my colleagues and I found that the range of Plateau STEL had shrunk by 39%, but still persisted in 15 Texas counties; while the Tamaulipan STEL appear to have only three small, isolated populations remaining. The USFWS has decided to not list the Plateau STEL as a threatened species; however, their ruling concerning the Tamaulipan STEL is still being reviewed. In addition,

we found that the majority of STEL were found in field margins, the thin strip of land between a crop field and the road’s edge. We found that ‘road-cruising, or driving slowly along the road’s edge, was the best method to locate STEL. But one of the more interesting things we learned was that STEL were the teenagers of the reptile world. They didn’t begin their day until after 11:00 am when the sun is high in the sky. In fact, STEL would emerge from their underground burrows when the ultra-violet index (i.e., intensity of the sun) would begin to peak for the day, which corresponded to when many reptile species would seek shelter and take an afternoon siesta.

It was a fun research project and a learning experience where much insight into STEL ecology was gained. My only disappointment during this project was that I never did get to meet Leonard; he sounded like an interesting character. 🦎

DONOR SPOTLIGHT: *Killam Family*

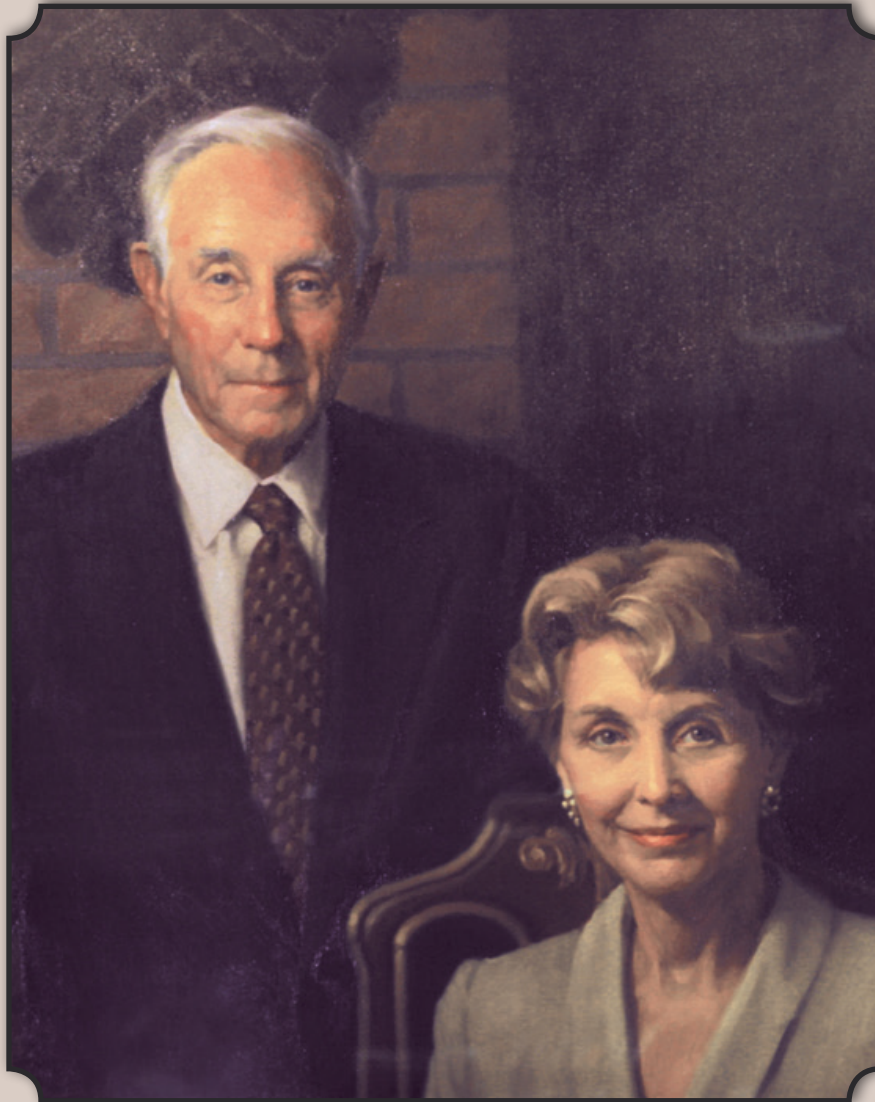
“Being a good steward, implementing a learning culture, being a leader, loving what you do, taking ownership and putting family first are a few key tenets that represent our organizational values,”
- David Killam

“Being a good steward, implementing a learning culture, being a leader, loving what you do, taking ownership and putting family first are a few key tenets that represent our organizational values,” stated David Killam, who is the Managing Partner at the Killam organization.

Those values highlight some of the vision, mission and culture statements for the Killam organization. These values define the Killam family. In particular, Radcliffe and Sue Killam, who are David’s father and mother, cared deeply about education. “My parents believed wholeheartedly in the inherent goodness of people and also the value of a good education,” says David Killam. “They saw education as the most uplifting thing that anyone could do to improve their life and in turn use that education as a springboard to do good for others.” Radcliffe was one of Caesar Kleberg Wildlife Research Institute’s first board members. He remained on the board until 1995.

The Killam family’s steadfast dedication to higher education is also evident through their philanthropic contribution of 300 acres, which established the campus for Texas A&M International University in Laredo, Texas. Sue served as a trustee for many years.

The Killam family has been in Laredo now for over 105 years. Oliver Winfield Killam came to Laredo and the South Texas region in search of oil in 1919. Because of those efforts, he brought his family from Oklahoma down to the border. He was born in 1874 in Missouri on a farm forty miles north of St. Louis. Oliver Winfield



Radcliffe and Sue Killam

was the youngest delegate in the 1896 Democratic National Convention in Chicago that hot July summer. He went to college, received a law degree, but never practiced law. Instead, he became an entrepreneur and politician, having managed a lumber mill, started a mercantile store and zinc mines, founded two towns (one in Oklahoma, one in Texas), and served on a

committee that went to Washington D.C. to meet with President Theodore Roosevelt which successfully petitioned for and received a signed proclamation of Oklahoma Statehood in 1907. He served as an Oklahoma State Senator. Later, he decided to raise money for an investment opportunity in the oil business, where he made his way to South Texas making Laredo his home at the age of 45.

Killam knew nothing about the emerging oil industry, as he ventured forward in 1919 and figured he could just learn by doing it. O.W. secured an oil lease on the Hinnant Ranch in Zapata County. After erecting his first oil derrick, he purchased a rig and began drilling. Before he had success, three attempts were made. Later that year, he developed the Schott oilfield just south of Miranda City, the little town that Killam had established near the railroad to help distribute and market his oil, while also ensuring there was a community for the labor he needed in the oilfields. Schott No. 2 produced 300 to 400 barrels of oil a day, establishing South Texas as an oil province and providing a foundation to grow his business. Killam became one of the best-known wildcatters in South Texas He was named "King Petrol" in July 1937.

Radcliffe was born in 1910 and nine years old when the family moved to South Texas. He grew up at his father's side and in his teenage years worked in the family's oilfields. After completing a degree in government and economics from the University of Texas in 1932 and a law degree from Harvard Law School in 1935, he returned to South Texas to work at the family business. In 1942, he enlisted in the US Navy, first serving in the Atlantic and then commanding a PT boat in the Pacific. After the war, he returned to South Texas to continue working in the family's oil business. He met Sue Spivey of Bonham in 1942 around the time he joined the US Navy. She was attending the University of Texas working towards a degree in Spanish Literature. They married a short six months after their first date. On the family ranch in Laredo, they made a home and raised four children.

Though Sue was born in the town of Bonham, Texas, she loved the outdoors, was bilingual in Spanish, and enjoyed living in a small close-knit community. And while she also did not grow up on a ranch, she took

to that way of life developing a profound love of the South Texas brush country and its people.

While Radcliffe loved to take people hunting, David says his father was not necessarily a shooter. His mother, on the other hand, was the consummate hunter – a “crack shot”. For 12 years running, she won various categories in Laredo's Cola Blanca and the Freer Muy Grande contests and in 2010 was inducted into the Muy Grande Hall of Fame. Though she particularly loved deer hunting, she also gained an affinity for big game hunting on several safaris all over Africa including Tanzania and Kenya.

In the early days of their married life, the screwworm kept the deer population from expanding. Not until the screwworm eradication effort got underway did the South Texas deer population really began to grow. Before that, there was not much done in the way of management. In fact, it wasn't really until the early to mid 1970s, after David came back to the ranch when the deer population was just getting a toehold, that ranchers began to appreciate the potential value of a deer herd – aesthetically and economically.

During this time, Murphy Ray and Al Brothers, who managed the Zachary ranches, began promoting some novel management ideas. They proposed conducting a deer census with a helicopter. Radcliffe was one of the first to get on board. “This idea of counting deer and extrapolating from that to get population density, a buck to doe ratio and recruitment ratio to figure out appropriate harvest was all brand new,” says David. “Before that, when a deer was seen it was shot.”

The Killam family shared with their lessees these ideas. They often had Brothers and Murphy give talks on the subject matter. Slowly ranchers began to understand and embrace the idea of waiting until a buck was fully mature before harvesting. It might be said that this was the dawn of whitetail trophy hunting.

Always passionate caretakers of the land and strong believers in its heritage and values, Sue and Radcliffe lived with their children on the family ranch.

David harvested his first deer with one of the ranch cowboys whom he had been entrusted to by his parents. “I can tell you exactly where it was,” says Killam. “We were cubing some cattle and there was a buck that came in regularly. I was probably six or seven.” By the time he was eight or nine, his parents let him take their old jeep out on his own and drive around the ranch so long as he was back by dinner. It was a life he loved.

Like his father and grandfather, young David Killam thought he wanted to be an attorney. Thus, he studied political science at the University of Texas. However, his passion for ranching sent him to the TCU Ranch Management program under the direction of John Merrill, and it was that passion that brought him back home. He was put in charge of managing the family ranch full-time.

His grandfather purchased the 80,000-acre Oritz Ranch in Webb County in 1957. Today the family also has ranches in Kansas, Nebraska, Montana, and Mexico. David purchased the 100,000 acre Duval

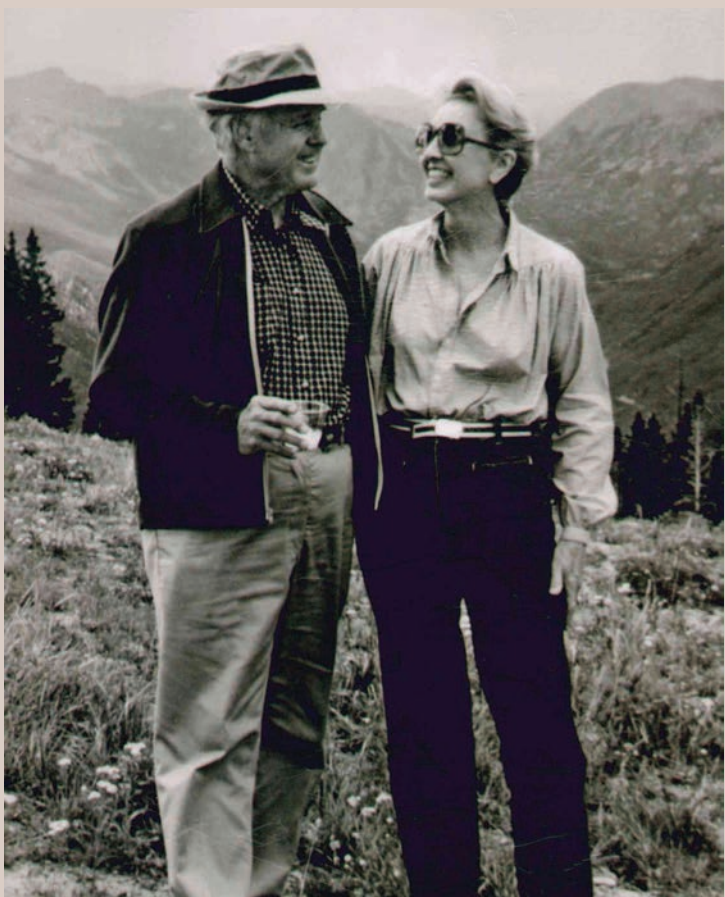
County Ranch, previously owned by Clinton Manges, out of bankruptcy in 1992. David has steadily acquired more acreage in the area including another 42,000 acres that was part of the original syndicate that owned the ranch before Manges.

“There’s something satisfying about putting the pieces together again,” says Killam. Wildlife and cattle go hand in hand on the Killam’s ranches. “Proper grazing with livestock is an essential tool for wildlife management,” says Killam. Even those who primarily buy ranches for recreational purposes are now coming around to the idea that grazing is a good tool that should be incorporated into a wildlife operation. The idea of matching numbers to the environment and adjusting based on fluctuating rainfall patterns has always been a practice in their livestock operation. They tried to do the same with their wildlife enterprise. However, just as with livestock the evolution of supplemental feeding, namely protein, brought about a huge change in deer management. While CKWRI researchers have shown that protein feeding makes a difference in the production of trophy bucks, Killam says the topic always makes for an interesting discussion as there are a couple of different ways to view the tool. Killam believes it’s a personal decision.

Prescribed fire is another tool used to help manage decadent pastures of buffelgrass. In recent years, thanks to research work done by CKWRI, they now use fire to help manage the more troublesome invasive grasses like tanglehead.

The South Texas landscape is continually changing. When his grandfather came here, the brush was still mostly in check. Today he describes it as a “sea of brush” that needs constant management. “It’s a balancing act,” says Killam. “Some brush is obviously good for wildlife habitat, but we can also have too much.”

These days their go-to tool is spraying with herbicides in a mosaic pattern. Killam points out that the use of any tool must be sustainable, but that’s particularly true when managing brush as it is a never-ending challenge. That’s why root plowing, which was once used a lot on their ranches and across South Texas, is no longer as common. In many cases, it’s simply not cost-effective. Chaining is another practice that was



Radcliffe and Sue Killam in Aspen

heavily used in the early years in South Texas. “That’s probably the worst thing you can do in my mind,” says Killam. “It goes from bad to worse.”

The ranch started with Brangus cattle but transitioned to Beefmaster. It’s their breed of choice still today. They also run stockers in the Flint Hills of Kansas. Killam says time takes on a different dimension through the seasons of ranching from getting a new calf crop on the ground to working the cattle and then marketing the fruits of their labors.

“It’s just satisfying work.” Killam has always enjoyed being involved as an oilman and as a rancher. “This whole notion of discovery is something that’s common to both,” says Killam. Both are complicated businesses, but he likes that aspect, particularly in the oil business. “We’re never right all the time. One of my favorite sayings from my grandfather relayed to my father and then to me was that we only have to be right 51 percent of the time.”

There are still a whole lot of mysteries left to be solved on the wildlife side of things, and as a board member of CKWRI, he’s helping the research team to untangle a few of them. These days the institute isn’t just focused on the mysteries of white-tailed deer and bobwhite quail but on a broad spectrum of species – game and non-game - as well as the flora particularly in the case of the Texas Native Seeds project.

Killam is also excited about the outreach to other parts of the state and the opportunities of learning and sharing of knowledge for the betterment of other unique ecosystems.

In terms of challenges, one of the biggest he sees is land fragmentation. “Believe it or not South Texas is getting industrialized,” says Killam. New landowners and the public as well must be educated about the downsides of fragmentation. He applauds the work being done by CKWRI on this front. For example, on the ocelot and the mountain lion, researchers are working to better understand what is going to be needed in the future to protect these species and their habitat from the inevitability of further fragmentation.



Radcliffe and Sue Killam

These days Killam still enjoys a good quail hunt with friends, “preferably on their places,” he quips. He used to run short-hair pointers in national horseback field trials for about 10 years. He still enjoys watching good bird dogs work. There have always been boom and bust cycles, but the quail population was more abundant when he was a kid. Still, Killam is excited that his two sons, Cliffe and David, enjoy the simple pleasures of the South Texas brush country and hopeful that his four grandkids will appreciate South Texas and a good quail hunt now and then too once they are old enough.

That’s the opportunity his parents gave him. They taught him by example never to take these things for granted.

“What they did tell me was to be honest and always tell the truth, but mainly it was the mentoring, watching them and seeing how they conducted themselves with dignity and respect for others, how they were interested in what other people thought and said and how they engaged with their community particularly on the educational front. That’s what I took from them. That’s what I have tried to pass on.

“South Texas is home; Laredo has always been my home. I wouldn’t trade it for anything.” 🌱

INFRASTRUCTURE OPERATORS THAT SET THE STANDARD FOR ENVIRONMENTAL STEWARDS

by Tony Falk



*Restored Pipeline in LaSalle County
Photo by Tony Falk*

Texas Native Seeds (TNS) was started at the urging of private landowners frustrated with poor results while attempting to restore native grasslands in South Texas. But recently there has been increased partnership between TNS and large-scale infrastructure entities leading to whole scale adoption of native grassland restoration by these groups. Over the last 2 years TNS has made major strides partnering with 4 major infrastructure entities and the commercial seed industry to develop seed mixes containing named, locally adapted native seed varieties for all of their seeding projects. Adaption of native seed by large

infrastructure entities helps to create a reliable market for native seed producers, and helps to restore native grassland habitat across the entire state.

One of the largest entities to adopt the use of named, locally adapted native seed varieties is the Texas Department of Transportation (TxDOT). TxDOT has been a long-time supporter of Texas Native Seeds, and starting in 2024, has adopted seeding specifications that utilize only native species in all rural areas of the state impacted by construction activities. This is a huge step forward and lays the groundwork for the use of

native species on TxDOT rights-of-way throughout the state. While this is fantastic news, it will be some time before the true impact of this change is apparent. There is still a lot of work that needs to be done educating local engineers about the new specification. Additionally, any project that had been started prior to 2024 will still be using old specifications. We are working diligently to make sure these new specifications are being utilized in TxDOT's rights-of-way as soon as possible.

Two other entities that have adopted named, locally adapted native seed varieties as their standard mix in Texas are AEP and Enterprise Products Partners. Deployment by these two companies possibly has greater impact to landowners in Texas because their rights-of-way frequently traverse private property. Both entities have seen the benefit of utilizing native species for the preservation of biodiversity, greater acceptance by private landowners, and generally being better environmental stewards. While AEP and Enterprise Products may not impact the number of acres that TxDOT does on an annual basis, their projects represent a significant amount of restoration on the landscape across the state. For example, Enterprise Products Partners Bahia Pipeline Project, which is set to begin construction soon, has the potential to establish a native grass corridor from Midland to Houston. These two companies are serving as leaders in their respective industries on how to be good land stewards.

The final entity that has adopted named, locally adapted native seed varieties is the Harris County Flood Control District (HCFCD). HCFCD is responsible for the management of about 18,000 acres within Harris County, potentially impacting millions of people. Starting in 2023, HCFCD began to use named, locally adapted native seed varieties on new construction projects. For years, HCFCD has utilized low-growing turf grasses in their retention and detention basins. Through use of named, locally adapted native seed varieties, they will not only improve biodiversity in the region, but improve water retention and infiltration rates, thereby reducing



*Restored Pipeline in Live Oak County
Photo by Forrest Smith*



*Restored Pipeline in Live Oak County
Photo by Tony Falk*



*Restored Pipeline in Upton County
Photo by Colin Shackelford*



*Sideoats Grama restored to the right-of-way along Highway 37.
Photo by Josh Breeden*

the amount of flooding seen in the county.

While these 4 entities have fully embraced the use of named, locally adapted native seed varieties, many other companies are also receptive at the landowner's request. During the last several years TNS has partnered with solar farm companies to provide seed mix recommendations for their installations. So far, these have been on a project by project basis, but typically represent large projects. Additionally, there are other oil and gas companies that will utilize named, locally adapted native seed varieties if specified by the landowner. This a growing practice in South Texas, and one that is frequently a smashing success. These types of projects can create long corridors of native grass that bisect dense brush often found on many South Texas ranches. While these projects are successful, they have not led to full scale adoption by the pipeline operators.

However, we are confident the more times we are successful, the more operators will see the benefits and, like Enterprise Products, will adopt named, locally adapted native seeds as their standard for restoration.

Texas Native Seeds continues to refine our knowledge of where commercial varieties perform the best, develop new varieties to improve biodiversity and establishment, and improve restoration techniques. While we have been working towards this goal for over 20 years, there is still a lot to learn. We can always work to improve diversity, and hopefully with each new success, we can encourage more landowners and land management entities to utilize named, locally adapted native seed varieties to increase acres of restored native grassland across the state. ♻️

ALUMNI

Spotlight

Joe
HOLBROOK

CKWRI Class of 2011
Associate Professor
University of Wyoming
Laramie, Wyoming

What is your background with the Institute?

From 2009–2011, I studied mountain lion ecology across Texas using molecular tools under my mentors Randy DeYoung and Mike Tewes. I earned a master’s degree in Range and Wildlife Management for my thesis “Understanding Mountain Lion Ecology in Texas using Genetic Techniques.”

What are you doing now?

For the last 6 years, I have been a professor at the University of Wyoming, where I have a 75% appointment in the Haub School of Environment and Natural Resources and a 25% appointment in the Zoology and Physiology Department. This last year, I was promoted from Assistant Professor to Associate Professor with tenure. I have developed a research program focused on understanding the ecology of predators and prey, with a strong focus on carnivore ecology. We currently have projects assessing the ecology and conservation of swift fox, red fox, coyotes, wolves, mountain lions, bobcats, Canada lynx, wolverine, and black bears. In most projects, our work sits at the intersection of remote sensing, ecology, and human-wildlife interactions. I teach undergraduate and graduate courses in data analysis and carnivore ecology.

Joe Holbrook during his time with the Institute.



How does your time at CKWRI continue to affect you today?

The three essential elements that I often reflect on regarding my time at CKWRI are (1) opportunity, (2) philosophy, and (3) independence. First, I experienced vast opportunity to expand myself by traveling across the country attending conferences and other events, which really helped me step into the field of wildlife science. Second, CKWRI provided an example of trying to bring authentic solutions to problems by working effectively and closely with collaborators with the aim of integrating wildlife into decisionmaking processes. Finally, with respect to independence, one of the main points of graduate school is to instill a level of intellectual independence. I often tell folks that my MS program at CKWRI was where I first recognized my intellectual independence taking shape, and I am very much grateful for that – as an aside, the general pride in independence within the lone star state probably didn’t hurt my development much either. For these reasons, and more, I am so grateful for the time and opportunity I had at CKWRI.



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Photo by Randy DeYoung