A close-up photograph of a spotted wildcat, possibly a Florida panther or similar species, looking directly at the camera. The animal's fur is a mix of brown, tan, and black spots. Its eyes are a striking blue-grey color. The background is a soft-focus natural setting with dry leaves and twigs.

CAESAR KLEBERG Tracks

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

CAESAR KLEBERG
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RESEARCH INSTITUTE

TEXAS A&M UNIVERSITY - KINGSVILLE

CAESAR KLEBERG *Tracks*

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Learn More About CKWRI



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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From the Director

I am writing from my house during a tempest of uncertainty caused by a virus. The virus coupled with low oil prices are likely to slam the Texas economy much as drought slams the pastures and wild creatures of Texas. Drought is familiar to the people and wildlife of Texas, not sought, but dealt with. Just as wildlife survive drought by adapting to the reality, increasing efficiency, and prioritizing essentials, the businesses and people of Texas will come through this as well. The Caesar Kleberg Wildlife Research Institute (CKWRI) will take its inspiration from the wildlife we work to conserve by adapting to the changing situation, focusing on essentials, and being poised to blossom when this virus-induced drought ends.



In the meantime, the current reality has provided ample time to reflect and focus on priorities. The CKWRI has two very clear priorities. One of those priorities is our applied research that supports wildlife conservation by providing knowledge for land stewards to meet their goals. The second priority is training graduate students. In our program, the students not only learn about wildlife ecology and management, but through their research projects, they learn to overcome challenges, see a job through to the end, and understand and appreciate the important role of private landowners for wildlife conservation and the overall health of natural resources in Texas.

CKWRI ALUMNI JOB TITLES

Pronghorn State Biologist Director of Conservation Programs
Director of Division of Hunting and Game Management Wild Turkey Project Manager
Private Lands Program Manager Migratory Bird Program Leader
Endowed Director Texas Invasive Species Institute- Campus Director
Upland Game Bird Biologist and Quail Program Leader Private Lands Biologist
Division Chief Panther Coordinator Wild Turkey Program Leader
Director of Government Affairs Science Division Chief and Deer Biologist
Senior Eco-toxicologist White-Tailed Deer Program Leader Director
Director of Conservation Science for Santa Lucia Conservancy Senior GIS Specialist
Veterinarian Wildlife Management Area Manager

To help convey the importance of our graduate education mission, the CKWRI has invested in building an alumni database. The database project will be a wonderful tool providing many beneficial applications and will illustrate the magnitude of impact from nearly 40 years of training master and Ph.D. students in range and wildlife management.

This incredible pool of biologists trained at the CKWRI and working on

behalf of wildlife conservation throughout Texas and across much of the United States is one reason I am bullish on the CKWRI's future. The Institute's future is bright because these outstanding alumni represent the value of a degree through the CKWRI and our alumni speak highly of their time in Kingsville. In doing so, they enable the Institute to attract the best and brightest graduate students from throughout the United States. Our supporters also value the Institute's mission in graduate education as shown by the 18 graduate student fellowships that have been endowed at the CKWRI. These endowed fellowships ensure the CKWRI will continue to produce outstanding alumni to work on behalf of habitat and wildlife. So, just as well-managed pastures can carry wildlife through a drought, the Institute's incredible base of staff, faculty, students, supporters, and alumni will ensure the CKWRI perseveres through the uncertain times ahead.

All the best,

Dr. David Hewitt
Leroy G. Denman, Jr. Endowed Director of Wildlife Research



LEARN MORE

Read more fun facts about CKWRI alumni on page 23.

Beating the Heat: Adaptive Strategies of Northern Bobwhite and Management Options During Periods of High Temperatures

by *Evan P. Tanner*

In his 1933 publication titled *Game Management*, Aldo Leopold described the elements of a species' habitat as: food, water, and cover. Fast-forward nearly a century later and these elements still form the foundation of wildlife research and management. We now use advanced field techniques and technology to gain a deeper understanding of the complex relationships between a species and their habitat. Food, water, and cover change in availability and quality across space and time in response to weather, soils, management, and more, adding complexity to how wildlife species use habitat to meet their daily, seasonal, and annual needs.

Physical conditions (such as temperature, precipitation patterns, or solar radiation) are fundamental in determining factors as large as a species' distribution to as small as how an animal navigates its environment on a daily (or even shorter) basis. Temperature in particular is an important driver of an animal's performance (i.e., survival). However, until recently, knowledge of how wildlife adapted to changes in thermal conditions in field settings was lacking.



When an animal begins to overheat, it risks physical harm unless it finds a way to cool down. At the most basic level, there are two options for an individual: physical mechanisms (such as a dog panting) and behavioral changes (such as lying in the shade). Northern bobwhite may use a physical mechanism called gular fluttering to cool themselves. You may have seen birds gular fluttering during the hot days of the South Texas summer: a bird will have its beak open and its throat region (gular) rapidly vibrating. Though this is a direct way for many birds to lose heat, during times of extreme heat, even gular fluttering will not be enough to prevent overheating. This is where behavioral changes become crucial for thermal regulation.

Bobwhite, for example, may take refuge from the heat of summer by seeking out woody cover. Ask any upland bird hunter or manager what one fundamental component of bobwhite habitat is, and they will inevitably answer “woody cover”. However, this woody cover is often valued primarily for its ability to provide cover from predators, particularly during the non-breeding season. Though woody cover does indeed provide crucial structure for predator avoidance for bobwhite, this cover is also essential for individuals seeking an escape from the elements, or thermal refuge. These areas, often called “loafing coverts” or “mottes” (Figure 1), may only make up a small portion of a bobwhite’s home range (perhaps less than 10-20%). Yet these areas can be up to 20°F cooler than the surrounding areas lacking woody cover. This sort of thermal refuge can provide much needed relief from the summer heat in South Texas, where temperatures can often exceed 100°F. Given that temperatures exceeding 102.2°F are dangerous for bobwhite, it is easy to see why these thermal refuges are an important component of bobwhite habitat.



Figure 1. Patches of woody cover, also known as mottes, are common features in many grasslands of the South Texas Plains. Such features are critical in providing thermal escape cover for northern bobwhite during periods of extreme heat common during the breeding season. Photo by Evan Tanner

Moreover, temperature plays a critical role in the reproductive success of bobwhite. Nesting adults select nest sites that are on average at least 10°F cooler than surrounding sites (Figure 2). Individuals that choose nesting sites that better buffer extreme heat experience greater nest success. Choosing cool areas is also important during brood rearing. Brooding adults take chicks to areas up to 18°F cooler than surrounding areas during the peak heat of the day.



Figure 2. A female northern bobwhite dissipating excess body heat through gular fluttering while incubating a nest during the breeding season. Photo by Rachel Carroll

However, these behavioral responses to extreme heat could come at a cost if bobwhite must use areas with less food. For instance, when bobwhite broods select for thermal refuge during the heat of the day, their movement patterns can be reduced to less than 100 feet during that period. If thermal cover has fewer insects and seeds, then the bird may be forced to choose between staying cool and filling its crop. Furthermore, when an incubating adult leaves the nest to forage (known as an off-bout), they rarely do so during the heat of the day (Figure 3). This illustrates the concept Dr. Fred Guthery termed “thermal brinkmanship”, which states

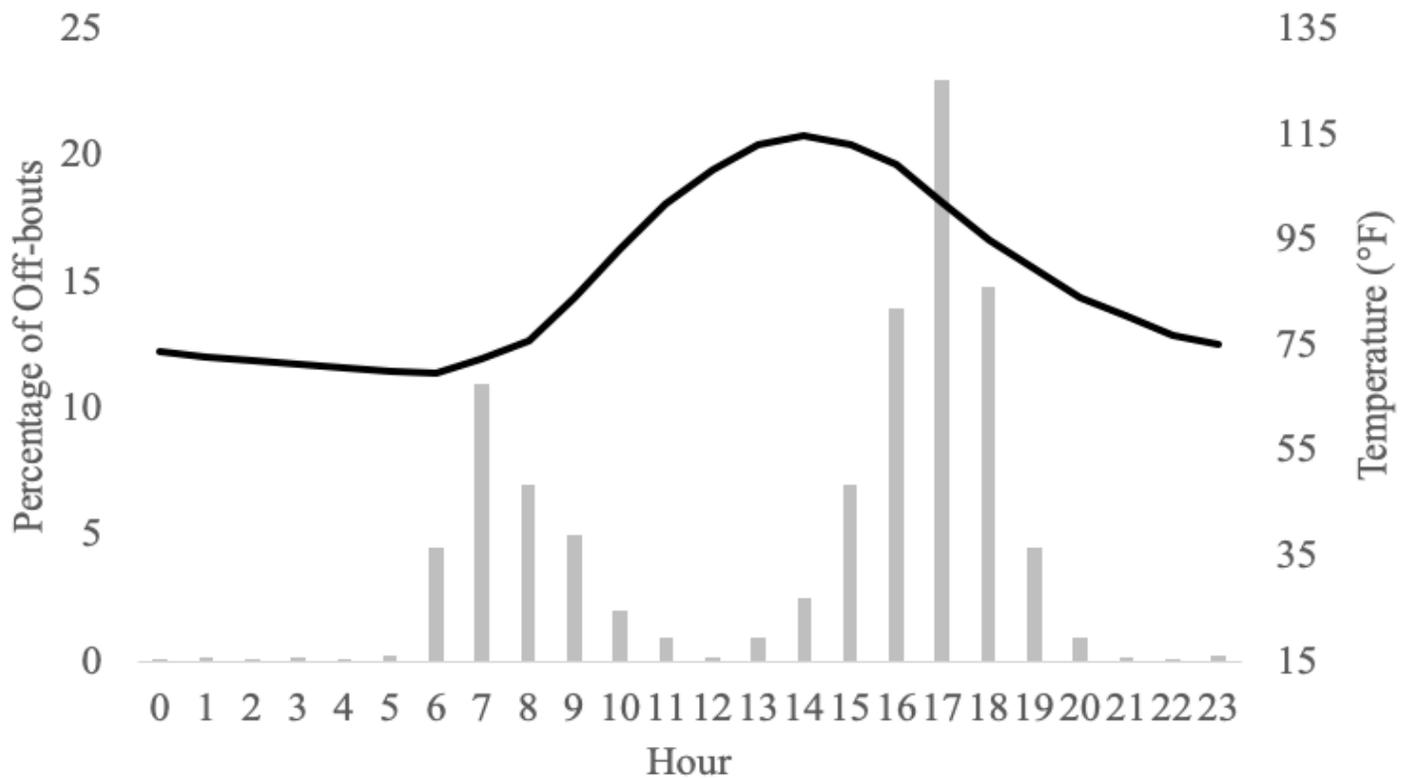


Figure 3. Percentage of off-bouts (foraging trips by an incubating quail) for northern bobwhite by hour over a 24-hour period. Average hourly surface temperatures near nests are represented by the overlaid black line. Figure and data reproduced from Carroll et al. (2018)^a.

^aCarroll, R. L., C. A. Davis, S. D. Fuhlendorf, R. D. Elmore, S. E. DuRant, and J. M. Carroll. 2018. Avian parental behavior and nest success influenced by temperature fluctuations. *Journal of Thermal Biology* 74: 140-148.

that bobwhite can often live on the edge of their thermal tolerance, and highlights the important role these physical mechanisms and behavioral changes play in the persistence of bobwhite in South Texas.

So as a land manager or landowner, what can be done with this knowledge? In South Texas, brush is likely not the limiting factor for thermal refuge requirements. In fact, many landowners use methods of brush removal to promote growth of grasses and forbs to provide nesting and brooding cover for bobwhite. However, the removal of woody cover in patches that are too large could result in areas that bobwhite cannot use during periods of extreme heat. If we assume the average home range of a bobwhite in South Texas is 40 acres, there should be immediate options for thermal refuge within that area. Approximately 30-40% of that home range should consist of woody cover (i.e., low-growing dispersed woody plants, shrubs, resprouting trees, etc.). So rather than removing entire sections of woody cover, a general recommendation would be to leave small patches (~0.2 acres) of woody cover intermittently throughout areas where brush control is a management objective. Furthermore, monitoring and controlling invasive grasses post-management is crucial. Non-native grasses not only hinder the use of these areas by broods, but they may also make the pasture hotter during summer because of their structure (thick monocultures with dense leaf litter), thus adding additional heat stress to both brooding adults and chicks. Ultimately, the goal is to have areas for shade and areas for feeding and nesting close to one another. Moving takes work, work converts to heat in the bobwhite's body, and thus management strategies that provide a mosaic of options within the bobwhite's home range will help to alleviate the thermal pressures that bobwhite experience in South Texas. ↴



FACULTY HIGHLIGHT

Evan P. Tanner, Ph.D.
*Assistant Professor and
Meadows Professor in Semiarid Land Ecology*

Evan is the new Meadows Professor for Semiarid Land Ecology. He received a Bachelor of Science degree in Forestry, Resource Management (2009) and a Master of Science degree in Wildlife and Fisheries Science (2012) from the University of Tennessee. His M.S. research focused on population ecology of northern bobwhite on reclaimed surface coal mines in western Kentucky. He received his Doctor of Philosophy degree in Natural Resource Ecology and Management from Oklahoma State University in 2015. His Ph.D. research focused on understanding how extreme weather events and future climate change influence population dynamics of northern bobwhite and scaled quail along the periphery of their distributions.

To read Evan's full bio, please visit our website at www.ckwri.tamuk.edu.

Challenges and Strategies to Manage Invasion of Tanglehead: A Threat for Wildlife Habitat Integrity

by J. Alfonso Ortega-S., Chase H. Walther, Alexandria DiMaggio, Rider Combs, Jose M. Mata, Humberto Perotto-Baldivieso, Sandra Rideout-Hanzak, and David Wester

Several exotic invasive grasses such as buffelgrass, old world bluestems, and guinea grass have been a concern for the conservation of wildlife habitat. These exotic grasses were introduced to the U.S. to increase the production of forage for cattle. Certainly, at the time these decisions were made, the value of wildlife species was not as important as now and it seemed like the right decision. One of the characteristics of these exotic grasses is that they are all very palatable for cattle. It is different in the case of tanglehead, which is a native grass that provides good forage for cattle, and naturally reduces/declines through heavy grazing. However, it has been invading native rangelands in the sand sheet region of South Texas, a prime area for white-tailed deer and bobwhite hunting. Thousands of acres of monocultures of Tanglehead have replaced critical native wildlife habitat.

Figure 1: The contrast of a recently burned area and an area containing large patches of tanglehead. The imagery was acquired in March 2019 using a DJI phantom 4 Pro Drone and the original resolution of the imagery is 1 inch.





Figure 2. Prescribed burn conducted in a tanglehead dominated pasture with 5,000 lb/ac of fuel.

In most of the ecological sites of the sand sheet region, tanglehead should be about 5% of the native vegetation cover. Small groups of 2 or 3 plants, spaced throughout the landscape, provides good for nesting cover for bobwhites or wild turkeys. However, tanglehead has gone from scattered clumps to large monoculture stands in a brief time. Tanglehead in Kleberg and Jim Hogg counties increased in percentage from 1.4% in 1999, to 2.7% in 2002, to 8.1% in 2009, and then to 17.8% in 2014, which means the plant increased coverage over 10 times in 15 years. This increase in tanglehead likely occurred because of peak rainfall shifting from spring to summer and a reduction in cattle grazing on ranches where the main focus was habitat management for wildlife. What should be done if a landowner notices that tanglehead becoming more abundant? Monitoring how tanglehead cover is changing over time is crucial for taking action. When spots of the plant start looking excessive, the use of glyphosate at

24 or 36 oz/ac can be used to kill individual spots of the invasive plant.

The lack of action at the initial stages of tanglehead invasion sets the stage for a much bigger problem. Once tanglehead becomes a monoculture the question becomes: is there any treatment to manage it and return the habitat to the original state? We have been successful managing monocultures of tanglehead with prescribed fire and cattle grazing. The capacity of tanglehead to accumulate forage (about 5000 lb/ac) is an advantage to use practices like prescribed fire. In addition to the reduction in tanglehead biomass and the mortality of some plants, the new growth of tanglehead increases the palatability of the forage for cattle and the nutritive value of the grass, which in turn reduces the presence of tanglehead through grazing. According to our research, mature tanglehead can be 4% crude protein compared to 16%, 34 days after fire. We found that



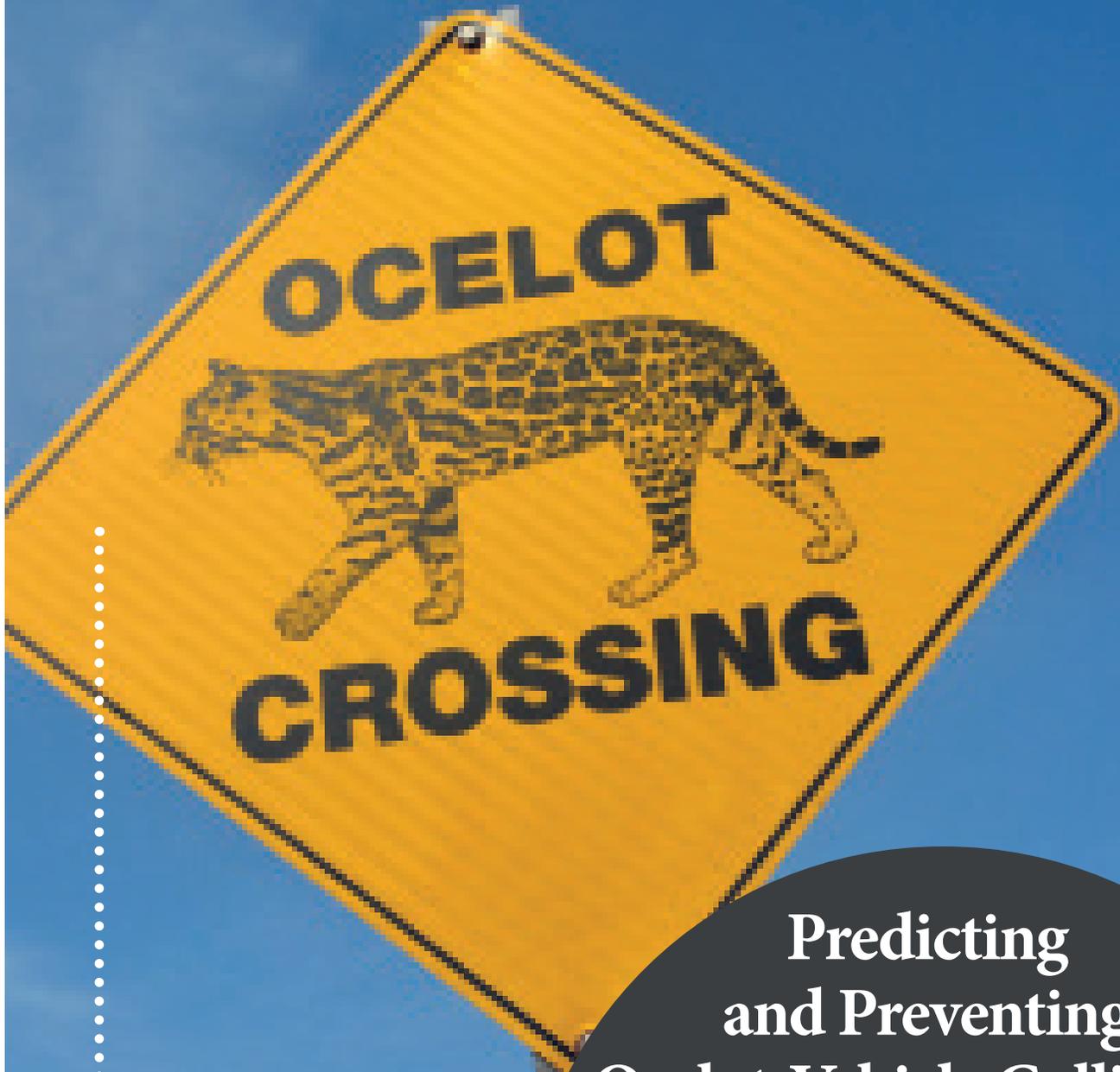
burning patches of about 10% of the size of the pasture, with a stocking rate of cattle of about 20 acres per animal unit, effectively reduced the tanglehead population and increased native plant species richness. Prescribed fire increased utilization of tanglehead to 52% in the burned areas compared to 6% in the non-burned areas and cattle used the burned areas 4.5 times more than the non-burned areas. Plant species richness increased 330% in the burned plots compared to before the burn. How often do we need to apply the prescribed burning and the cattle grazing to maintain the invasion of tanglehead to acceptable levels? The differences from burning and grazing may last for 3 years, which is an acceptable treatment life. When is the best time to burn tanglehead to manage the invasion? Late fall or early winter burns have shown to have the best results. Considering that tanglehead is a warm season grass, burning right before or at the beginning of the dormancy will weaken the plants, decreasing the density and providing opportunities for native plants to germinate and establish. What if it is not possible to conduct a prescribed burn? Poor burning conditions may occur in South Texas often. Anecdotal observations indicate that mowing patches of tanglehead increase the palatability and nutritive value of the grass, attracting cattle to the mowed areas which would result in a similar effect as using prescribed fire.

There are still many questions to answer about tanglehead management. Our research program is generating practical knowledge to deal with the problem. At the end of 2020, we will have completed a four-year study on the use of prescribed fire and cattle grazing to manage tanglehead invasion on a private ranch in South Texas. The research we are conducting with tanglehead will provide more reliable information that may be applied by ranchers in the region. 🔥



ONLINE

Get the latest research news from CKWRI delivered directly to your inbox. Visit our website at www.ckwri.tamuk.edu to sign up today!



Predicting and Preventing Ocelot-Vehicle Collisions

by Amanda Veals, Joseph Holbrook, and Michael Tewes

The ocelot (*Leopardus pardalis*) is a medium sized cat (weighing between 17-30 lbs), characterized by a golden-brown coat that is richly spotted. Ocelots have long tails and rounded ears, and their spots are typically rosettes; characteristics that set them apart from the similarly-sized bobcats (*Lynx rufus*) that co-occurs with the ocelot in the United States.

Nocturnal carnivores, ocelots rely on dense patches of woody cover, particularly native Tamaulipan thornshrub in Texas, to hunt for small mammals and birds.

A neotropical cat, the ocelot occurs throughout Central and South America, into Mexico and the southern tip of Texas. Ocelots historically ranged into Arizona and Louisiana. Now, the only breeding populations occurring in the United States reside in South Texas in Kenedy, Willacy, and Cameron counties. Listed as federally endangered since 1982, it is estimated that fewer than 80 individuals remain in the United States. Land conversion due to urban expansion and agriculture have led to rapid habitat loss and fragmentation for the ocelot population. Loss of habitat combined with increasing road densities and traffic have led to a dangerous landscape for the ocelot to live in.

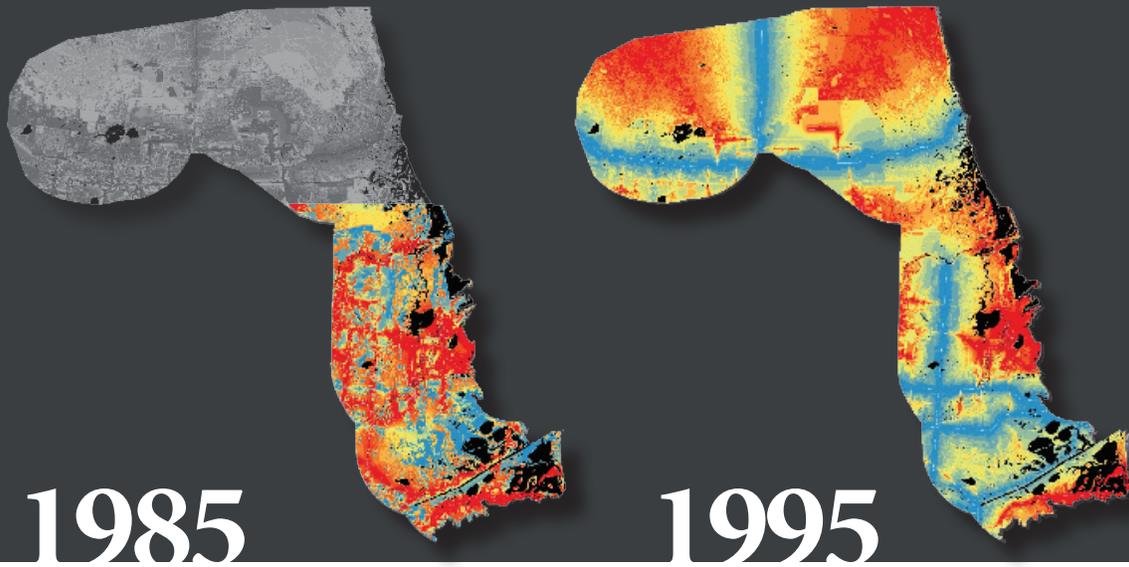
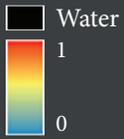
Ocelots occur in two isolated populations in southern Texas: one that resides on private ranchlands in Kenedy and Willacy counties and one on the Laguna Atascosa National Wildlife Refuge in Cameron County. These populations are separated by about 20 miles of agriculture and roads in the Lower Rio Grande Valley, which has been identified as one of the most rapidly developing human population centers in the United States. Vehicle collisions are considered the leading source of mortality for this critically endangered species in Texas. Beginning in 2018, we initiated a new study partnering with the Texas Department of Transportation (TXDOT) to answer questions related to ocelot ecology and road mortality. Specifically, we are interested in the resource selection and landscape connectivity of the ocelot. Our partnership with the Pharr District biologist,



Photo by Larry Ditto

Robin Gelston and John Young of the Environmental Affairs Division of TXDOT have provided us with the much-needed support and guidance for this research.

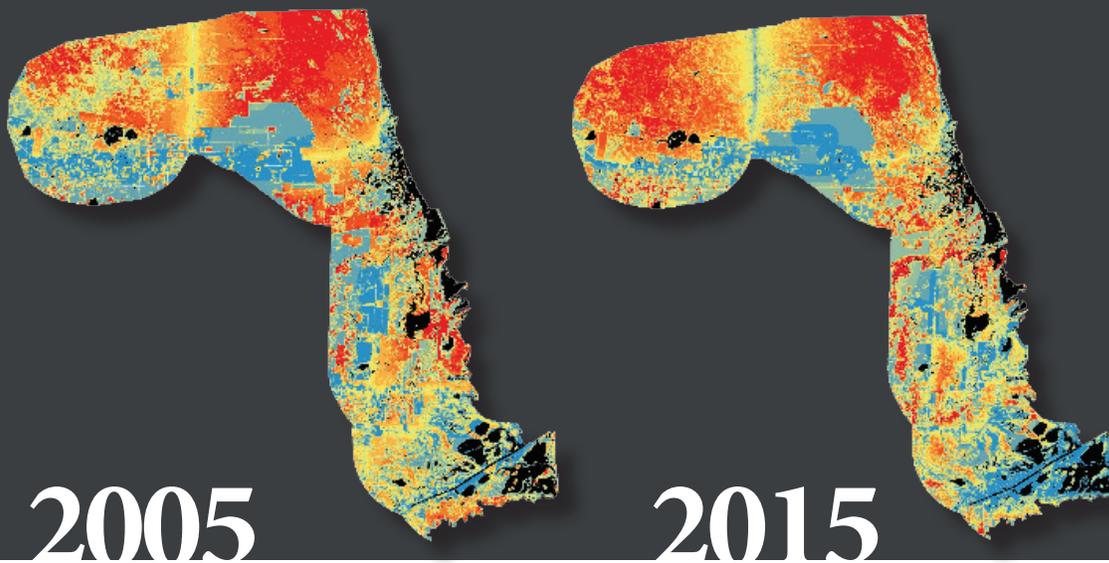
We are using a 35-year telemetry dataset collected from 78 radio-collared adult ocelots across the two populations. We want to understand what aspects of woody vegetation cover ocelots select for and how roads may influence that selection. We are examining use of resources across multiple spatial and temporal scales to see how that use may change as habitat availability decreases and barriers to movement (roads) increase on the landscape across 35 years.



Our initial results support previous work showing that ocelots use areas with large, dense patches of woody cover. We also discovered that ocelots will avoid areas near large roads with heavy traffic. We found that as time progressed over our 35-year dataset, available habitat decreased and roads increased on the landscape. It is evident that roads play an increasingly important role in ocelot use and movement across the landscape.

Wildlife crossing structure built by TXDOT on State Highway 100 for ocelots to cross under the road safely. Photo by Amanda Veals





We were able to map this change in predicted ocelot occurrence on the landscape across time. In 1985, we began predicting areas of high use by ocelots in the refuge subpopulation. After 1995, we were able to predict areas across the entire study area, which included northern ranchlands in Kenedy and Willacy counties. Areas in warmer colors (i.e., orange and red) are where ocelots were more likely to be found on the landscape. We can see that these areas of high use by ocelots were further from the road and in areas where there is a lot of intact woody habitat.

Comparison maps show predicted areas in South Texas likely to be utilized by female ocelots. Researchers began tracking changes in 1985 for female ocelots living on the Laguna Atascosa National Wildlife Refuge. Then, from 1995 to 2015, they tracked changes for the entire study area, including female ocelots living on northern ranchlands. Areas in warmer colors (red/orange) indicate where female ocelots were more likely to occur than cooler colors (blue/green) which represented areas female ocelots would try to avoid.

Maps created by Amanda Veals

We will use the models to identify areas ocelots will likely move across the landscape and, specifically, where they are likely to cross roads. By understanding how ocelot behavior changes over time, particularly in relation to woody cover and roads, we can develop insights into how ocelots will respond to future road networks and potential road crossing structures. We will continue to examine the role roads play in ocelot habitat use to mitigate future road mortality.

In summary, habitat loss and fragmentation from roads is one major problem ultimately threatening the survival of the ocelot in South Texas. A more immediate problem is direct mortality from vehicle collisions. The goal of our work is to help inform the placement of future road crossing structures to help mitigate ocelot-vehicle collisions and to increase landscape connectivity for this critically endangered species. Ocelots are threatened with extinction in South Texas, and our research aims to provide meaningful solutions to the problems this species faces. 🐾



Donor Spotlight:

Ben F. Vaughan, III

Ben F. Vaughan, III may be described as a devoted husband, father and grandfather. He may also be described as a hunter, conservationist and lover of the land, but all that aside Vaughan is a man of integrity. By trade, Vaughan is a third generation attorney though by his count there are some five generations of attorneys on both sides of his family.

Since 1968, he has been at the Austin firm of Graves Dougherty Hearon and Moody after clerking a year at the Texas Supreme Court. His practice early on focused on litigation, but over the years it evolved into environment and natural resource law, namely oil, gas, land and water.

A native of Corpus Christi Vaughan grew up hunting as there were a “jillion” sparrows that lived in the palm trees around his house. “I’d get after those sparrows with my Red Ryder BB gun and the starlings too, though they were harder to kill,” says Vaughan. He loved the outdoors. His family lived right on the bay, and on the weekends he would traipse out to the pier near Cole Park sit down with his pound of shrimp and catch fish.

Vaughan has long been an avid quail hunter and a lover of Brittany Spaniels, which he’s raised for 50 years. Hektor was his first, and now the last one is 11 year-old, Belle. “I had her spayed because I decided I wasn’t going to have others I couldn’t take into the field or be in my arms when I laid them to rest,” he says. He chose Brittanys because they’re “tolerable” house dogs and “wonderful” bird dogs.

Back in the quail heyday of the 1980s, it wasn’t uncommon when hunting from horseback to kick up 300 to 400 coveys over a long weekend. He still has a good number of birds on his country though the population is pretty cyclical. “The quail experts at CKWRI say it tracks the rain cycles, and I believe them,” says Vaughan. We still have some birds. If I could just get a rain, I’d have a lot of birds next season.”

Vaughan insists that future generations must not be allowed to experience the outdoors on their LED screens. “If we allow that to happen pretty soon we won’t have any outdoors. Hell, you can get an app to go bass fishing; you can probably get one for skeet shooting. “I know a lot of people who don’t hunt,” he continues, “but they still like to walk in the woods and hear the birds sing. I’m one of them.”

Vaughan’s family history is a storied one. His paternal grandfather, Benjamin Franklin Vaughan, one of 13 children, was an attorney in Greenville, northeast of Dallas. He also served five terms in the Texas legislature. Vaughan says his father never talked much about hunting with his own father though he remembered him talking about hunting and fishing in the Sabine River bottom likely on his aunt and uncles country. Vaughan’s maternal great grandfather, Robert Dougherty, immigrated from Ireland to the U.S. in 1847. He lived in New York and Kentucky before coming to Texas in 1860 where he settled in South Texas at San Patricio. Vaughan’s grandfather, James Robert Dougherty, born in 1871 and a contemporary of his Grandfather

Ben’s passion for the past, present, and future of wildlife conservation is demonstrated by time in the field with his son James, his favorite bird dog and his father’s 1937 Model 21 Winchester 20 gauge that his mother gave his to his father on their first wedding anniversary in 1938 and bought for \$125. Ben brings that passion to the CKWRI where he has served on the Advisory Board for 33 years.

“I DON’T HAVE ANYTHING TO HANG MY HAT ON EXCEPT TO TRY AND SET AN EXAMPLE IN BOTH MY LAW PRACTICE AND THE WAY I LIVE AND THE VARIOUS ORGANIZATIONS THAT I’VE TRIED TO SUPPORT”

Vaughan, was also an attorney and later an oilman. However, certified to teach at the age of 16, his formative years were spent riding horseback up and down the Rio Grande River educating families along the way. After that, his grandfather Dougherty spent two years at St. Louis University and then the University of Texas. Vaughan says his grandfather only had one year of actual law school. He got most of his training in the law offices of Lon C. Hill and James B. Wells. He was admitted to the bar in March 1895 and then subsequently set up his own practice in Beeville. “He was a fine lawyer, very well respected,” says Vaughan. “He argued cases in the U.S. Supreme Court.”

In *Brown v. United States*, Brown, an African American, was convicted of murdering an Anglo. Dougherty represented Brown, and in 1921 he took the train from Beeville to Washington to argue that Brown acted in self-defense. The opinion, overturning the lower court ruling, was written by Justice Oliver Wendell Holmes. In essence it was decided that if a person is attacked and he believes he is in immediate danger, he has “no duty to retreat” and if he kills his attacker then he has “not exceeded the bounds of lawful self-defense.”

Dougherty began acquiring land in Jim Wells and Live Oak County in the early 1900s. He began piecing together the Lagarto Ranch, just west of Orange Grove, the first ranch of any consequence, in 1911. Sometime around 1946, he purchased another 23,000 acres in Duvall County for \$6 an acre. He ran cattle on the ranches throughout his lifetime. Dougherty also got into the oil business with W.E.

Hewit of David City, Nebraska. “The first well they drilled was a stinker,” Vaughan says. “It made maybe 40 barrels a day.” They owed \$5,000 to the drilling contractor, money which they didn’t readily have. Thus, they offered the lease to the drilling contractor in exchange for the amount owed. The contractor refused so they borrowed the money from the bank. “Two weeks later the offset operator brought in a well making 40,000 barrels a day.” Over the years, the team of Hewit and Dougherty brought in many more very lucrative wells in several different prominent fields throughout South Texas.

On the ranch in Duval County, Dougherty paid a dollar an acre for 1/64 royalty interest. There were 32 gates from the paved road to the gate into the ranch. “Dad said he went there one time with his father-in-law, but after opening 32 gates coming and going he never went back.”

The desire to get a good education has been passed on from generation to generation. When young Vaughan came of age, Rice University was the hardest school to get into “because it was free – room and board – everything.” Only two people from his high school class got in. He didn’t bother to apply. Instead he applied to Duke, Vanderbilt and Stanford and was accepted at all but ultimately chose Stanford because he’d never been to California. “I went there on a train.”

It was during a short tenure at the graduate school at the University of Pennsylvania where he was studying the classics that he met Daphne DuPont. They were married shortly thereafter and have been together almost 57 years.

Vaughan still has some of the country that his grandfather Dougherty put together though he did swap the Dougherty family's interest in the Duval County ranch for one in La Salle County. He still has the Willacy County country that his grandfather acquired as a 15 percent contingency fee which he earned when he assisted in the settlement of the Garcia and Yturria family controversy over their land holdings. Over the years he also bought land in Webb, Hidalgo, Frio, La Salle, Travis and Bastrop County to name but a few. He's always run cattle on the Willacy, La Salle, Webb and the Frio County ranches. "It's a tough go in the cattle business." Admittedly drought is something one lives with in South Texas. He was 10 years old during the 1951 drought that ended up lasting some seven years. He recalls going to the shoe store with his mother. "My mama bought a good pair of shoes that cost \$40, and I remember saying, 'Mama that's four good steers.'"

Vaughan is presently the longest serving member of the Caesar Kleberg Institute advisory board, dating back to 1987. He came to be involved because of his representation to the Thomas Marion O'Connor family. T. Michael O'Connor was a good friend of Billy Welder and Sam Beasom, then the director of the institute, and they approached Vaughan about serving on the board. He recalls their first meeting being held in the cafeteria on the campus of what was then Texas A&I University.

A few other fellow board members at the time included the late Ed Harte, Dick Jones and Jimmy McAllen, both of whom recently became Emeritus Advisory Board members. Vaughan served as chairman of the advisory board from 1989 to 1999. He takes being on the board to heart. "I have a considerable amount of symbiosis with the other members of the board," says Vaughan. "They, like me, love South Texas. They love the land, the cattle and the game. We all have sufficient resources, sympathetically, politically and economically to make a lasting difference to the condition of South Texas wildlife." Some years ago the couple made a donation to CKWRI

for the Daphne and Ben Vaughan Endowment for Birds of Prey, Songbirds, Shorebirds and Habitat Research. On caring for all things wild, Vaughan opines that each has a responsibility to ensure that the next generation has the same opportunities Vaughan and his contemporaries have been afforded to enjoy the outdoors.

He and Daphne live in the same home they bought when first moving to Austin. It is there that they raised their two sons, Ben F. Vaughan, IV and James Cullen Vaughan, whom he refers to as his "miracle child", as they had him late in life. Born in 1987, there's 23 years difference between the brothers. Like their father, both graduated from Stanford. Ben IV got his master's degree there as well and then went on to Berkley for a Ph.D. James graduated with honors from Stanford and then graduated from the McCombs School of Business at the University of Texas. "I'm proud of my kids; they had a really smart mama," says Vaughan. "Equally important is their love of the outdoors and its preservation."

A genteel and humble man, Vaughan claims to have done little. To those who know him, it his love of all humanity that shines through. "I don't have anything to hang my hat on except to try and set an example in both my law practice and the way I live and the various organizations that I've tried to support," says Vaughan. "I've just tried to be where I was needed."

In 2013 he was diagnosed with stage four melanoma but thanks to new experimental treatments he is now cancer free. "I'm eternally grateful for that, but when I was diagnosed I said that 99.99 percent of the world's population had never had a day in their life as good as everyday of mine has been," he insists.

He says the rosary every morning on his two-mile jog through the neighborhood with his faithful companion Belle. "I've been blessed," he concludes. 



The *Texas Native Seeds* Pipeline Prairies Initiative

by *Forrest S. Smith, Keith A. Pawelek, and Shyla Rabe*

The scope of impact from new oil and gas pipelines being built in Texas needs no introduction to private landowners. One of the many challenges faced by land managers and owners is the restoration of native plants to areas denuded in construction of these pipelines. In most cases, pipeline installation results in the loss of existing vegetation cover, and to alleviate erosion concerns, reseeding is a standard practice in the pipeline industry. The choice of which seeds to plant for pipeline reclamation, however, is often a point of divergence between pipeline companies and landowners. Texas Native Seeds (TNS) is often called on to provide needed seed mixture recommendations. Providing this service has become one of the most important functions of our program in terms of acres impacted

in the state. Our work on this topic involves three areas of emphasis: working with attorneys who draft easement agreements, working directly with landowners to provide recommendations, and increasingly, working with pipeline companies to provide large-scale recommendations for entire pipelines. We call these efforts our Pipeline Prairies Initiative, and this work has been especially impactful at influencing a great deal of restoration in Texas in the past few years.

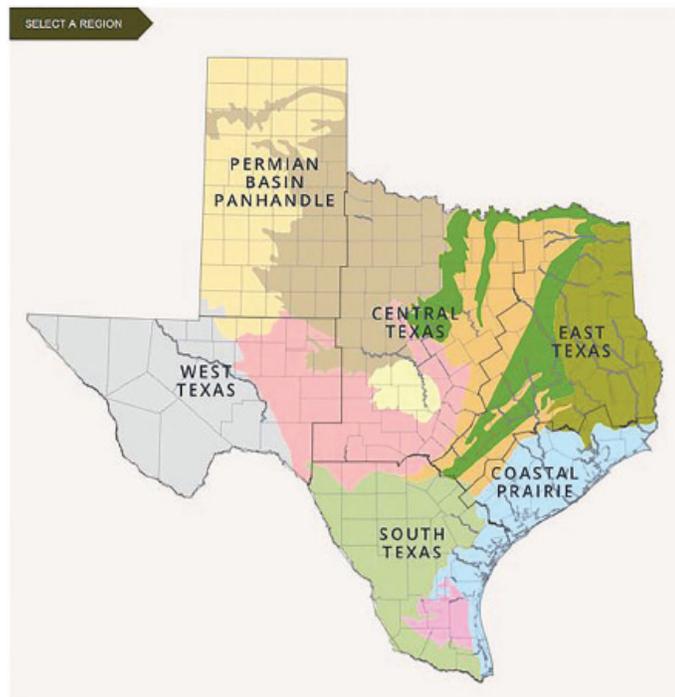
One of the most important aspects to address in an effort to have the desired native seeds planted after pipeline construction is the easement agreement between the pipeline companies and landowners. Attorneys working on these agreements have a major impact on the use of native seeds and restoration



outcomes. Addressing all aspects of the seeding operation in the easement agreement, but especially the specific seed mixture to be planted, is extremely important. TNS has worked with numerous attorneys to craft language for use in easement agreements that will ensure that a specific seed mix is outlined, or for projects that will occur in the future, that the pipeline reseeding contractor will be required to obtain a recommendation for the seed mix from TNS at the time of reseeding. Negotiating for, and including appropriate language in pipeline easement agreements has proven very effective at making sure the desired native seeds are planted. We are glad to work with all attorneys on these provisions, and can provide suggested language and contact information to include upon request.

TNS has also had the chance to work directly with hundreds of landowners and managers to provide native seed mix recommendations for pipelines being built across Texas. We can best serve landowners when provided the exact location or soil series of the planting sites, goals of the property, and anticipated date of seeding. Using this information, our regional project staff can evaluate the site and desired outcomes, and make a specific recommendation of seed varieties based on our research and evaluations on similar sites. As a result of the generosity of our donors and supporters of the program, TNS is able to provide this service free of charge. We encourage landowners to reach out directly to our regional project assistant directors to obtain needed recommendations.

In the last few years, as restoration of pipeline easements using native plants has become more common, several pipeline companies have engaged TNS directly to provide seed mix recommendations at the scale of entire sections of some pipelines, or entire pipeline projects. These efforts began with a project to assist Enbridge Energy with seed mix recommendations for the Valley Crossing Pipeline through the South Texas Sand Sheet. Following this project's many successes, at least 3 other pipelines crossing Texas, including two



- Texas Ecoregions**
- Blackland Prairies
 - Gulf Coast Prairies & Marshes
 - Oak Woods & Prairies
 - South Texas Brush Country
 - Coastal Sand Plains
 - High Plains
 - Piney Woods
 - Trans Pecos
 - Edwards Plateau
 - Llano Uplift
 - Rolling Plains



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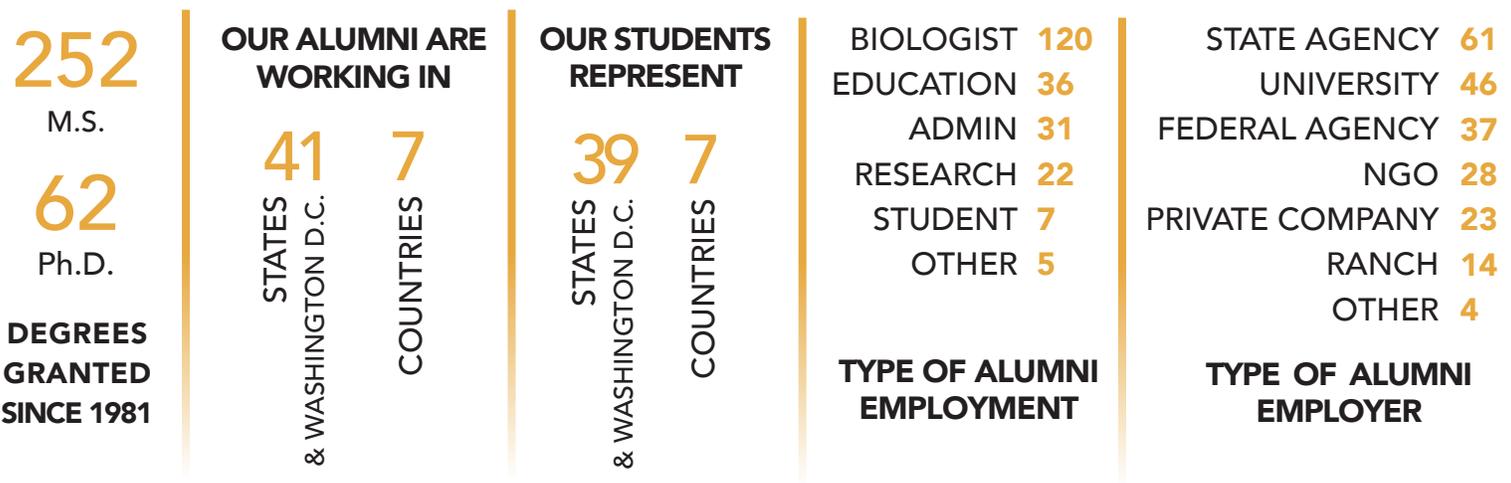
by Enterprise Products, have been similarly assisted. TNS is well suited for this work, as we have the ability to assess market availability of needed seeds through our relationships with commercial seed companies. This is important because projects of this scale are measured in the thousands of acres scale. In general, around half of properties impacted by any pipeline do not specify the seed mix to be planted, and choice of seed is up to the company building the pipeline. For this half of most pipelines, the willingness of the pipeline industry to plant native seeds as specified by TNS has resulted in some of the largest scale restoration seeding efforts ever done in Texas. These actions have also had significant positive influences on the commercial native seed industry. We are extremely excited about the growing interest and involvement of the pipeline industry in this way.

In support of all of these efforts, in 2019, TNS staff created a web-based seed mix recommendation tool. This tool provides county-level seed mix recommendations for general soil types for all of Texas. With three mouse clicks, constituents can access a PDF document providing recommended seed varieties, vendors, and contact information for the appropriate TNS regional contact for technical guidance. Since the tool went live in October 2019, it has been accessed an astonishing 3,200 times, with 86% of those users being new visitors to our websites. In recognition of the impact of this resource, in February 2020, the seed mix tool received an award from the Texas Chapter of The Wildlife Society for Outstanding Electronic Media. We will continue working to update this tool as new TNS seed sources for many areas of the state are commercialized, as research findings improve our knowledge on seed variety performance, and according to seasonal seed availability.



Oil and gas pipelines are having a large scale impact on the wildlife habitats of Texas. By working to make these easements Native Pipeline Prairies, through native seeding, TNS is hopeful to have real and meaningful impacts on the state’s native plants and wildlife. Cooperating with easement attorneys, private landowners, and industry to reseed native plants to new pipelines has the potential to impact literally tens of thousands, if not hundreds of thousands of acres of Texas in just the next few years. We are proud to be able to work to make a difference in enabling and informing the best restoration possible. Please contact TNS at (361) 593-4037, if we can assist you in any way with an ongoing or future pipeline restoration project. 🌱

CKWRI Alumni: By the Numbers



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