East FOUNDATION

ANNUAL 2022

RANCHING | SCIENCE | EDUCATION

Advancing Land Stewardship by Developing Leaders

The Carbon Question

Science Spotlight

Research at Geographic and Temporal Scale

Behind the Gates Photo Essay

A Rare Asset

East FOUNDATION

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About Us

East Foundation promotes the advancement of land stewardship through ranching, science, and education.

We manage more than 217,000 acres of native South Texas rangeland, operated as six separate ranches in Jim Hogg, Kenedy, Starr, and Willacy counties. Our land is a working laboratory where scientists and managers work together to address issues important to wildlife management, rangeland health, and ranch productivity. We ensure that ranching and wildlife management work together to conserve healthy rangelands.

East Foundation was created through the generous gift of the East family in 2007. To honor their legacy, we uphold their vision and values that were established more than a century ago. In pursuit of our mission, we use our abundant natural resources to build future leaders through programs that introduce students to private land stewardship. We invest in future professionals through internships, graduate fellowships, and close engagements with university programs.

We care for our land and are always exploring more efficient ways to get things done and are continuously guided by our values to conserve the land and resources.

We do what's right for the land and the life that depends on it.

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The Next 150 Years

From the CEO

Neal Wilkins, PhD.

For many, the native rangelands of South Texas are viewed as "raw" or "vacant" land – land that has yet to be developed and put to good use – land that is just waiting. Truth is, the Coastal Sand Plains and adjacent Brush Country are some of the most valuable remaining wildlands in the state. The wildness of the land conceals the fact that much of the territory has consistently supported livestock ranches for over 150 years. A cycle of severe multi-year droughts is a defining feature of this land, and those droughts have challenged those that live close to the land for all recorded history. Despite its challenges, this land is resilient. But it takes stewardship to maintain its productivity. As Texas' population continues to grow, the pressure on this land creates new and different challenges. At East Foundation our job is not only to conserve the land that we manage, but it is also to prepare for future challenges to ranching and wildlife conservation. These challenges are not easily anticipated.

The East Foundation is designed to pursue our mission over the long run. This means we will likely be here 150 years from now, advancing land stewardship for yet another generation. How our ranching, science, and education programs mix with the impact of droughts, disease, market demands, population pressures, and government policies will shape the future of native rangelands and ranching. To get an idea of how much change can happen in the next 150 years, let's reflect on the last 150 years.

In his 1969 book, *Forgotten Legions*, Val Lehmann reveals some of the overlooked history of land use in South Texas – most notably, he exposed the fact that 150 years ago sheep outnumbered cattle on South Texas rangelands. In 1880 there were 1.6 million sheep in the territory between the Nueces and Rio Grande rivers – by contrast, there were only 221,597 cattle. The forty years that followed saw a great increase in South Texas cattle numbers – so much so that by the 1920s Hebbronville was considered the largest shipping point for cattle in the nation. These changes were driven not only by changes on the land, but by changes in politics, economy, and innovation.

In his 1972 book, *The Lasater Philosophy of Cattle Raising*, Laurence Lasater shares the ranching philosophy of his father Tom Lasater, a South Texas rancher who developed the Beefmaster cattle breed starting in 1931. One of Tom Lasater's most important philosophies was best stated in the following quote:

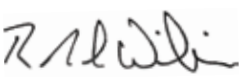
"All policies affecting both public and private ownership of land should be based on the ancient biblical concept of stewardship, which says that the person privileged to own land is only the temporary custodian of it and is morally obligated to leave that land in better condition than he found it."

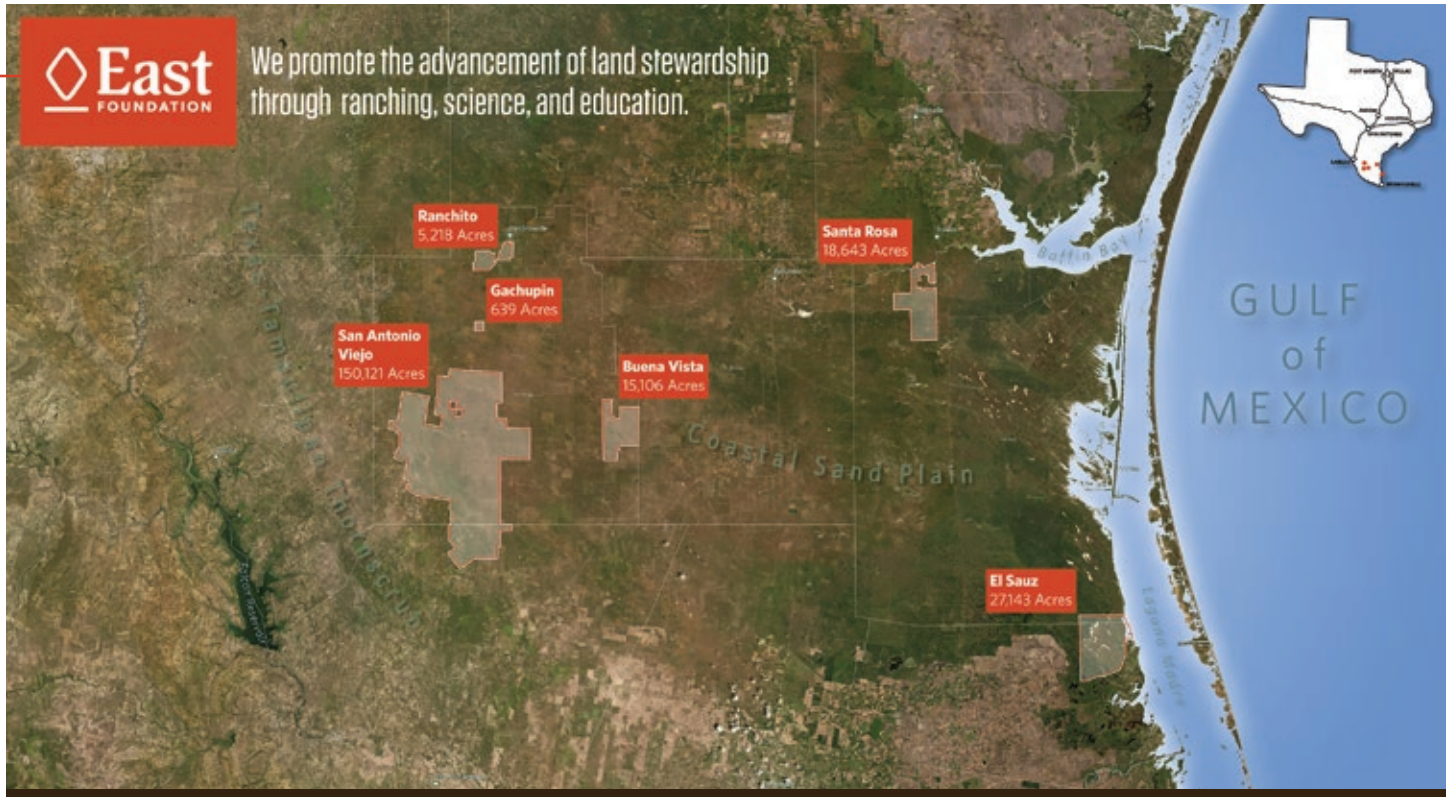
The problem with Lasater's philosophy is that it doesn't get as much attention as it should, at least outside of ranching circles. Tom Lasater's philosophy was heavily influenced by his father, Ed Lasater, a South Texas rancher who at the turn of the 20th Century was one of the state's largest cattle ranchers, as well as being founder of the town of Falfurrias. Ed Lasater witnessed the dominance of cattle in a region that had once been dominated by sheep. A change not likely anticipated by those raising sheep.

Our state's population has increased ten-fold since the time when Ed Lasater began ranching in South Texas – yet the ideal of land stewardship has continued to stand strong for many ranchers.

This year's Annual describes our ongoing efforts at managing our native rangelands, developing a productive cattle ranch, conducting research that is relevant, developing future leaders, and conserving our wildlife resources. In the pages that follow our guest authors describe how we work with our university partners to overcome the unpredictable challenges of working in the harsh environment of South Texas – one of our nation's "Last Great Habitats."

East Foundation's mission drives our long-term planning as well as our day-to-day decisions. Because ranching and land management are at the center of all we do, we don't get to reliably predict what our greatest challenges will be on any day. This means that things like wildfires, droughts, cattle markets, and equipment problems can sometimes disrupt our plans. Our long-term work, however, will continue to be led by the philosophy of leaving land in better condition than we found it.

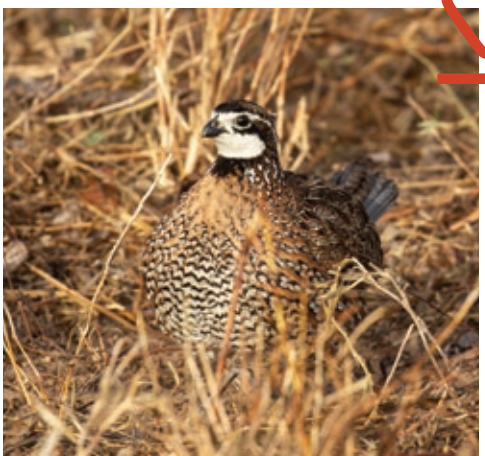




About the East Foundation

Our Mission

East Foundation promotes the advancement of land stewardship through ranching, science, and education. In pursuit of our mission, we use our working ranchlands and abundant natural resources to build future leaders through programs that introduce students to private land stewardship. We invest in future professionals through internships, graduate fellowships, and close engagements with university programs.



Our Land & Operations

Like the East family before us, we ranch in the Wild Horse Desert, a region also known as the South Texas Sand Sheet and the Coastal Sand Plains, an area prone to both drought and extreme heat. We manage over 217,000 acres of native South Texas rangeland, operated as six separate ranches in Jim Hogg, Kenedy, Starr, and Willacy counties.

Our History

The East Foundation ranchlands were acquired over a period of about one hundred years. This land was used as a traditional family owned and managed cattle operation. When Robert East passed away in 2007, he gifted his landholdings to the East Foundation.

Today, the East Foundation operates as an Agricultural Research Organization, the first of its kind in the United States. Working in concert with university, agency, and other partners, the Foundation's cattle ranches are a working laboratory where scientists and managers work together to address issues important to wildlife management, rangeland health, and ranch productivity. We ensure that ranching and wildlife management work together to conserve healthy rangelands.

ADVANCING LAND STEWARDSHIP BY DEVELOPING FUTURE LEADERS

By Katy Baldock

From the time of its founding and still today, education outreach and engaging students of all ages with the land has been a driving force behind the East Foundation's mission. The Foundation fosters relationships between students and natural resources on virtually every level, whether by bringing a group of elementary school children onto the ranches for field lessons or providing a recent college graduate with their first professional job. With the education programs, internships, research opportunities and job positions, students are granted the ability to gain valuable experience that helps them evolve into future leaders.

EARLY STAGES OF EDUCATION

The education programs East Foundation offers for K-12 students provide the foundation to develop an appreciation for the natural world at an early age, value natural resources, and begin to understand the many benefits that come with properly caring for those natural resources. These programs introduce students to land stewardship in the classroom, on the land, and virtually.

"Young people need to be part of something bigger than themselves — and engaging them with what happens on working ranches helps them understand a different world. This is what we do with our education programs."

East Foundation has partnered with a variety of organizations and businesses to provide innovative and effective programs that are continually growing and expanding.

The current programs offered are:

- **Field Lessons** on the El Sauz and San Antonio Viejo ranches. Partners for Field Lessons include Texas Wildlife Association, the County of Willacy, and The University of Texas – Rio Grande Valley Coastal Studies Lab.
- **Virtual Field Lessons** available to students across Texas. Partners include the Museum of South Texas History, Texas A&M AgriLife Extension, Caesar Kleberg Wildlife Research Institute, and The University of Texas – Rio Grande Valley Coastal Studies Lab.
- **Behind the Gates** on the El Sauz Ranch, partnered with Caesar Kleberg Wildlife Research Institute, IDEA Public Schools, the Museum of South Texas History, and the Texas Parks & Wildlife Department and sponsored by Las Huellas. Behind the Gates at San Antonio Viejo Ranch, partnered with Caesar Kleberg Wildlife Research Institute and the Texas Parks & Wildlife Department.
- **Land Stewardship Ambassadors** offered to students in Bexar, Cameron, and Webb counties, in partnership with The Witte Museum and sponsored by Texas Farm Credit.
- **Land Stewardship Lab** at The Witte Museum campus in San Antonio.
- **Wildlife by Design** lessons in South Texas classrooms, partnered with Texas Wildlife Association.
- **Stewarding Texas** lessons available to educators and students across the state through Texas Wildlife Association.

These programs offer unique educational experiences for students of all ages across Texas, and collaboration with like-minded businesses and organizations makes it all possible.

"To foster young minds through the various stages of learning takes more than one group," said Tina Buford, Director of Education for the East Foundation. "Rather, it requires a like-minded team with expertise at every level, starting in grade school and continuing onto higher learning and hopefully ending in a chosen profession within the natural resource field. The East Foundation serves as a convener of partners that can link arms and share the load to make that happen."

Elliff Motors in South Texas is one of those partners that has contributed to the success of the Foundation's programs.

"My family is very interested in enhancing the education of our young people," said Bill Elliff, owner of Elliff Motors. "We were all in when we were asked to participate in Behind the Gates. The East Foundation is allowing children the exposure to wildlife and what the land is all about, including conservation."

The East Foundation has always placed emphasis on hands-on learning experiences, whether it is in the classroom or on the land. Bringing South Texas students onto the Foundation's ranches allows them to see how a working cattle ranch operates and introduces them to private land stewardship practices.

"When our educators get young students out onto working ranches, they are actually inspired to learn — this makes them more likely to succeed," said Wilkins. "Finally, our programs help these same kids fall in love with their native land in South Texas. This builds leadership."

As extensive and wide-reaching as these programs are, they are only one part of the overall impact the East Foundation's education outreach has on Texas students. The K-12 programs are the beginning stages of an education experience that carries students into their young adult lives and even early careers.

HIGHER EDUCATION AND BEYOND

Beyond K-12, the East Foundation offers internships for college students, graduate student research opportunities, and even first jobs for recent graduates and young professionals. Undergraduate and graduate students in Texas contribute to the East Foundation's many research projects each year, allowing them to gain valuable experience in the field that prepares them for post-graduate life.

"It is really important that university graduate scientists are exposed to the realities of land management," said Wilkins. "It adds practicality to their work and gives them perspective they cannot get elsewhere."

In the fields of wildlife biology and natural resource management, getting experience in the field early on is not only beneficial, but often a requirement before landing a

"When our educators get young students out onto working ranches, they are actually inspired to learn — this makes them more likely to succeed."

> "Any successful strategy will not only support livestock productivity in any given year but will improve range conditions which will benefit our wildlife."

professional job. The East Foundation's opportunities provide students with this experience to add to their resume, and the network of university research partners and interns is vast. Alumni of these programs have gone on to become research scientists, wildlife biologists, big game specialists, assistant professors, ecologists, rangeland specialists, and more across the country.

"We work hard to help our university partners as they recruit top-quality students," said Wilkins. "We then work just as hard to make sure those students are engaged in the everyday challenges of ranching and wildlife conservation. This not only sets them up to have greater impact in their careers, but it makes their future work more relevant."

DEVELOPING FUTURE LEADERS

The East Foundation is focused on developing future leaders by providing a variety of opportunities and experiences at every stage possible — from grade school to post-graduate education, and even into their early professional years. These programs, events, internships, research positions, and more all help foster students throughout their important developmental years of life, and encourages them to value our natural resources and implement responsible land stewardship practices in both their personal lives and professional careers. It also sets them

up for success as they continue in their conservation journey. This, in turn, helps them progress into thoughtful and experienced future leaders in conservation and land management.

"Our goal is to invest in the next generation of leaders," said Wilkins. "It's important that we inspire our future land stewards. This is the overall purpose of both our education programs and our university programs."

The results of these education opportunities not only benefit the individuals who participate in them, but also benefit the land. When students are given the tools to make educated decisions about caring for our natural resources, it helps preserve the health of the land and conserve the wildlife that depends on it.

"For us, success comes in many forms," said Buford. "A student who participated in Behind the Gates at the Elliff-El Sauz Education Center is inspired to practice conservation within their own community. A student who participated in a field lesson on the San Antonio Viejo Ranch, and as a result applied and participated in East Foundation and Witte Museum's Land Stewardship Ambassador program. That same student applies to be a summer intern with the East Foundation while aspiring to join the Caesar Kleberg Wildlife Research Institute's research team. Each one is a win. We consider any and all scenarios that include students being inspired by the natural world to be a success, so that they take part in conserving the land and all the lives that depend on it."

Ensuring that children and young adults continue to have interest and participate in natural resource conservation is imperative to the future of our land, and the East Foundation is doing their part to make that happen.

"We need more scientists that really understand land management," said Wilkins. "And we need more land managers that understand science."

Education

The East Foundation has been working hard to expand our education opportunities in South Texas, while ensuring that we are developing future land stewards. Our education programs focus on delivering effective programs in the classroom, on the land, and in partnership with like-minded organizations. During the 2021-2022 school year, our educators have reached:

11,667
Classroom Students Reached With Wildlife By Design Programs

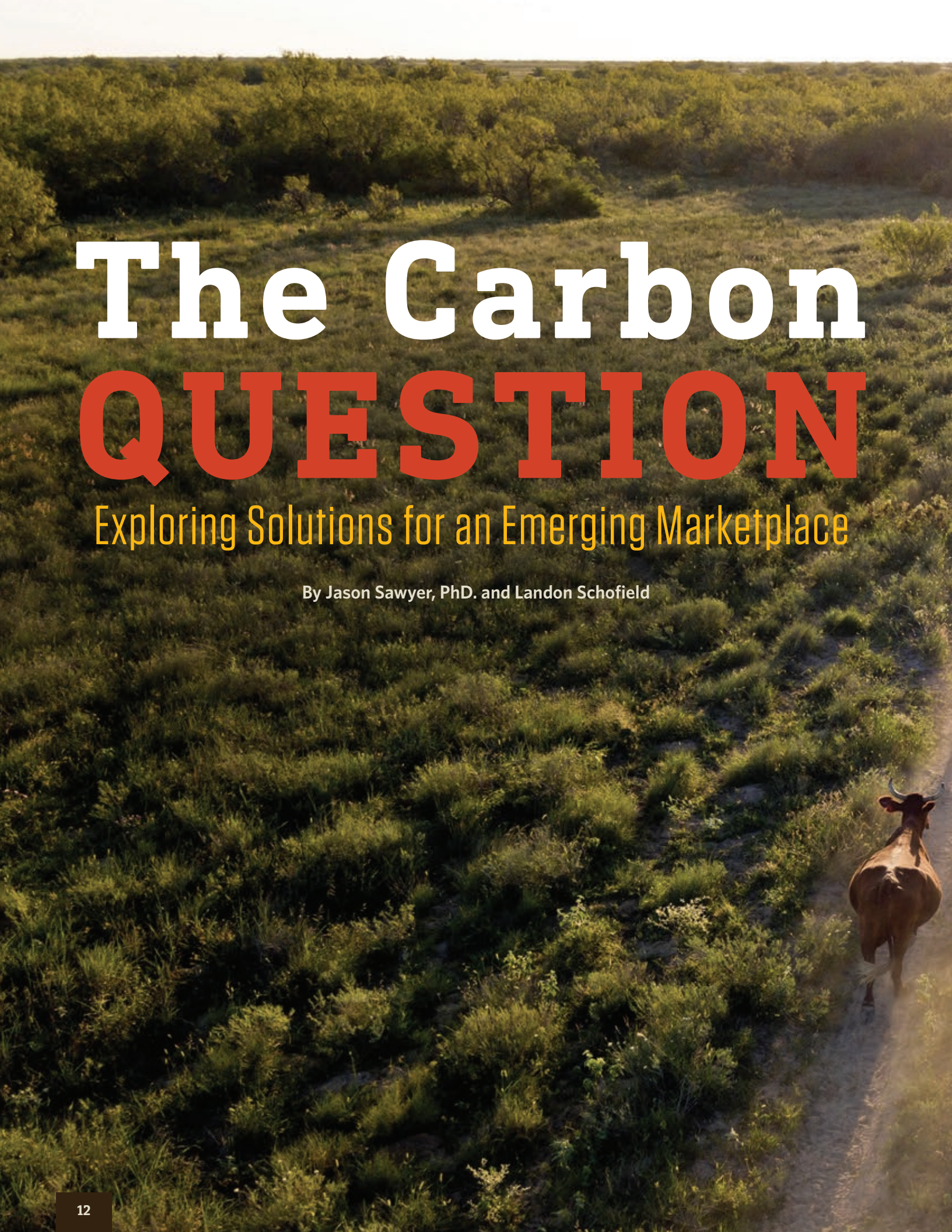
11,618
Virtual Field Lessons

39
Graduated Land Steward Ambassadors Program

1,740
Students On Ranch Field Lessons

1,299
Students At El Suaz Ranch Behind The Gates

East Foundation is committed to providing future generations with the tools to make educated decisions and do what is right for the land and the life that depends on it.



The Carbon QUESTION

Exploring Solutions for an Emerging Marketplace

By Jason Sawyer, PhD. and Landon Schofield

Over the past several years, increasing public concern about the potential effects of long-term climate change and recommendations by intergovernmental organizations have resulted in both regulatory and voluntary actions aimed at reducing emissions of greenhouse gases. In the United States, this has largely been voluntary, but many corporate entities have responded to public concern by making pledges to achieve 'net-zero' greenhouse gas emissions in the relatively near future. Achieving 'net-zero' emissions requires that an entity seek first to reduce emissions that result from their activities, but such reductions cannot eliminate all greenhouse gas emissions. Entities therefore seek 'offsets,' or sinks, to balance the emissions that cannot be eliminated through other means. These voluntary actions demonstrate the power of market forces to impact the delivery of public goods and may also create opportunities and incentives for the historical generators of ecosystems services – the stewards of private lands.

Landscapes function by using photosynthesis to capture carbon dioxide from the atmosphere and convert it into other biologically useful molecules. Some of this material is consumed and respired as a component of the carbon cycle; some is retained in plant biomass, and some is translocated into the soil and incorporated. Landscapes have long been known to be significant reservoirs of carbon and offer the potential to accumulate additional atmospheric carbon dioxide. The demand for 'carbon dioxide offsets' generated by net-zero goals has created an emerging marketplace for land-based 'carbon credits.'

"This transaction is deceptively simple – plants grow, and carbon accumulates," said East Foundation Chief Science Officer Jason Sawyer. "But measuring this accumulation and predicting a landscape's potential to accumulate and retain soil carbon is challenging. We aim to advance land stewardship through ranching, science, and education...and to do so by providing managers of landscapes with the information needed to make wise decisions. We are seeking to address key elements of the carbon question on our lands, so that other managers can make decisions that improve their own lands, as well as offer an ecological solution to the demands of a developing marketplace."

First, the East Foundation aims to simply define and describe how much carbon is currently stored in the soils that support our landscapes. Rangelands are diverse and soil composition varies even across one ranch, making this determination challenging. Preliminary sampling from the Foundation's Coloraditas Grazing Research and Demonstration Area, an 18,538-acre site on the north end of the San Antonio Viejo Ranch (Figure 1), indicated that on average, the soils at the study location contained an average of 4.69 metric tons of carbon per acre. However, this amount varied substantially across the landscape – the overall range of measurements was from 2.56 to 13.17 metric tons per acre. (Table 1) This variability was mostly driven by variation in the soil organic carbon concentration, with a smaller amount of the variation from differences in soil bulk density measured across the site.

Figure 1: Map of sampling locations in the Coloraditas Grazing Research and Demonstration Area (CGRDA) on the San Antonio Viejo Ranch. Sampling location are within eight, 2-acre permanent grazing exclosures which represent the different ecological sites that dominate the CGRDA.

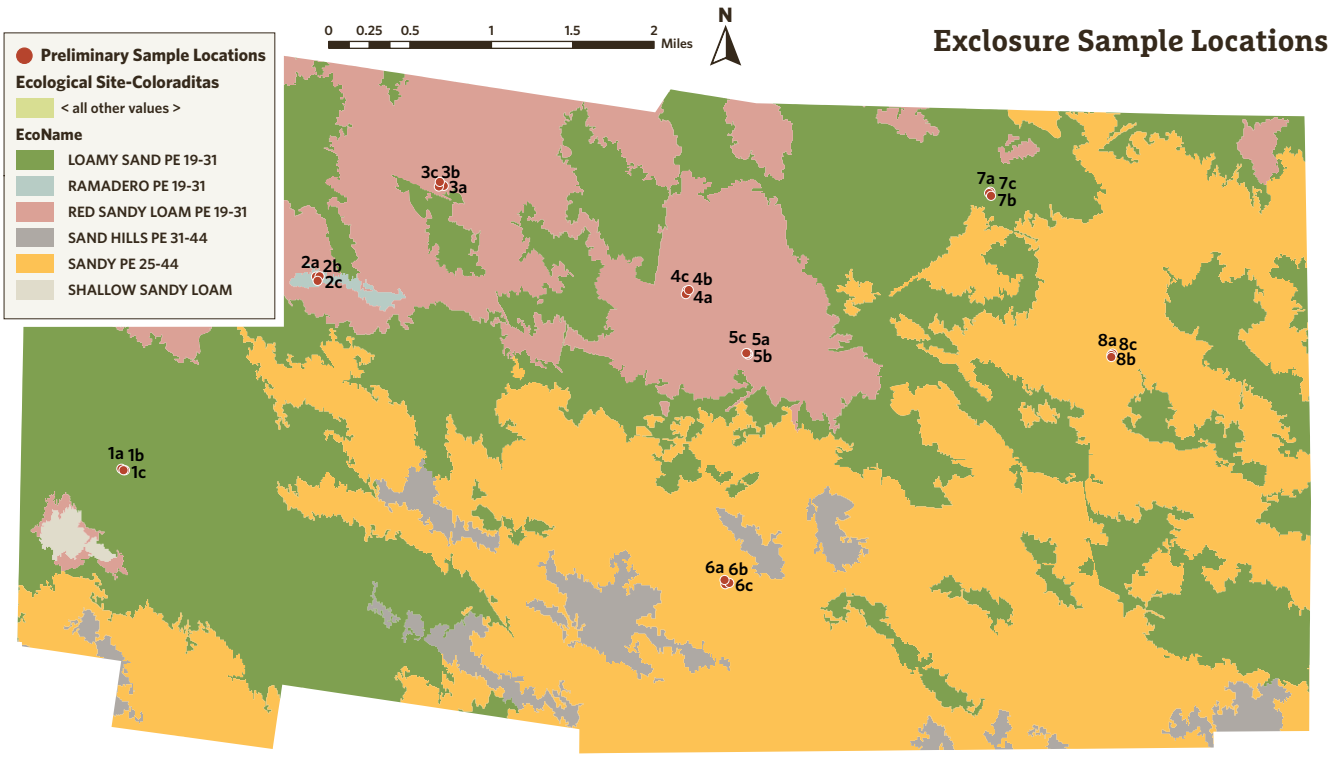


Table 1: Metric tons of total carbon per acre across the four sampled ecosites represented across the Coloraditas Grazing Research and Demonstration Area on the San Antonio Viejo Ranch located in Jim Hogg County, Texas.

Ecosite	Average Total Carbon (Metric Tons/Acre)	Range (Metric Tons/Acre)
Loamy Sand PE 19-31	5.89	2.56-13.17
Ramadero PE 19-31	4.14	4.00-4.28
Red Sandy Loam 19-31	5.22	3.17-9.77
Sandy PE 25-44	3.22	2.58-3.83

Soil carbon sampling is resource intensive – current methods require substantial labor for the physical collection of samples across large landscapes, and laboratory analysis of the collected samples is also time-consuming and costly. This added cost can incentivize a sampling approach that would underestimate soil carbon stocks or prevent detection of meaningful changes. Under-sampling is generally the greatest threat to adequate monitoring, but managers must be able to 'right size' a sampling effort for real-world applicability. By understanding the variation in measuring soil carbon, scientists at the Foundation hope to establish sampling protocols to produce reliable and accurate soil carbon estimates.

While there are various standards that define how a carbon credit is generated, the most straightforward approach is to measure the change in carbon accumulated in soil at a given site over a specified period of time. One metric ton of accumulated carbon represents 3.67 metric tons of carbon dioxide (CO_2 is 12/44ths carbon), so measuring the change in soil carbon results in the generation of carbon credits that represent metric tons of carbon dioxide. However, the variability in the measurement makes detecting the difference a challenge. By continuing our sampling efforts and describing this variation, we aim to develop tools that better enable managers and contractors to determine the number of samples that might be required to detect a change of a given size.

From the baseline data, scientists can identify the size of change in a laboratory measurement of soil carbon that represents accumulation of a given number of carbon credits per acre. For example, accumulation of one carbon credit per acre for five years represents accumulation of five total credits. Because the bulk density of the undisturbed soil is unlikely to change over that time scale, all the change would be represented in the laboratory measure of soil carbon. If our average measure is 0.24 % soil carbon, then a change of 0.07 percentage units (from the baseline measure of 0.24 % to a new measure of 0.31 %) reflects that five-credit accumulation. This is a very small change and might require a sizable number (over 1,000) of samples to detect it with the degree of confidence required by a standard. Our study aims to find methods to classify sites in a way that reduces the variability associated with measurement and therefore optimizes sampling... or allows managers to determine a minimum detectable change given a certain sampling plan, so that realistic (market credit) commitments can be made.

Of course, it is also important, and currently unknown, what the rate of accumulation might be and how specific

Photos: Wyman Meinzer

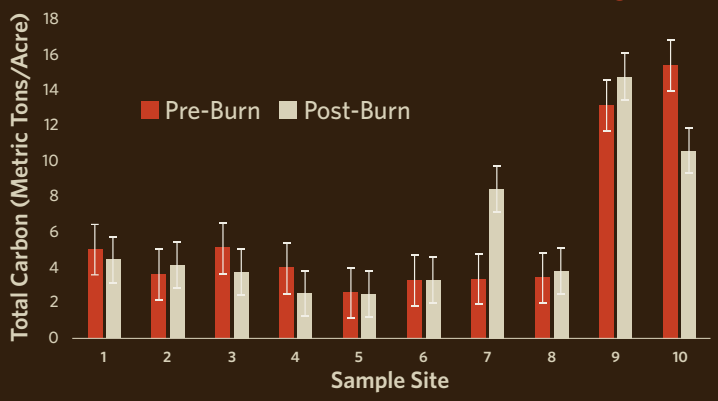
management decisions may influence this accumulation rate. Because few locations collected baseline data a decade ago, this information is scarce to non-existent. At East Foundation, we do know the management history of our lands over a decade timescale. We are identifying sites that may have some difference in management history but that are otherwise similar, so that we might estimate differences in carbon accumulation that can be attributed to management influence. While this chronosequence approach is not definitive, it will provide some immediate information and direction for longer-term studies. It is most important that Foundation researchers gain perspective on the effects of management practices that are commonly deployed by range managers to promote healthy and productive landscapes including grazing, prescribed fire, and vegetation management.

"In conjunction with the prescribed fire research program at our El Sauz Ranch, we have been able to assess the effects of prescribed fire on soil carbon status," said East Foundation Scientist Range and Wildlife Biologist Landon Schofield, the lead investigator for the project. "Sampling occurred immediately before and after the application of fire and highlighted the initial response of soil carbon to this type of disturbance. (Figure 2). What we have seen is that across the burn area, observed soil carbon values decreased slightly on average."

Return interval sampling will be conducted on an annual basis to evaluate the restabilizing of soil carbon to pre-burn values. In the immediate term, it appears that controlled burning does not have a negative impact on soil carbon status, so implementing this practice is unlikely to impair a manager's ability to engage in a carbon crediting program. Over time, researchers will be able to determine whether the positive effects of prescribed fire on other landscape qualities translate to increased rates of soil carbon accumulation (see sidebar: Prescribed Fire as a Management Tool).

Over the upcoming season, the Foundation will address similar questions related to the acute effects of grazing management and brush control using this approach. While these data will allow managers to gain insight, they also set the stage for ongoing observations, so that ranch staff can begin to more effectively describe accumulation rates and effects of management decisions on these rates for South Texas rangelands. In conjunction with key partners at the King Ranch Institute for Ranch Management, this program helps the Foundation fulfill their strategy of being 'management minded' scientists so they can provide useful and relevant information to 'science minded' managers. Enabling effective decision making allows us all to do what is right for the land and the life that depends on it.

Figure 2



Total carbon values sampled prior to and post application of fire on East Foundation's El Sauz Rranch in Willacy County, Texas.

Prescribed Fire as a Management Tool

Prescribed fire is a land management tool used to restore and maintain wildlife populations through habitat improvement. Although prescribed fire can have short-term negative impacts on variables such as soil carbon levels and some species of wildlife, a thoughtful prescribed fire program increases the overall productivity and nutritional value of native rangelands. However, there is still much to learn about how best to apply fire (e.g., season and burn return interval) to coastal rangelands along the South Texas Gulf Coast to maximize benefits to cattle and wildlife.

To address these questions, the East Foundation and our partners are engaged in an operational-scale, long-term study on our El Sauz Ranch to determine:

- How much do soil carbon levels change?
- Are burned areas preferred by cattle, and if so, for how long?
- Do cattle preferences differ by season of burn?
- What are the movements of cattle in response to prescribed fires conducted in different seasons?
- What are the nutritional values of important grasses following burns conducted in different seasons?
- Do plants and corresponding small mammal and bird communities change with differing fire return intervals (e.g., long and short)?
- How do butterflies and other important insects respond to seasonal burns, return intervals, and fire intensity?
- Are Texas tortoise populations impacted?

The ultimate goal of this project is to produce optimal prescribed fire recommendations for coastal rangelands in South Texas. This knowledge will equip landowners and managers with better information on applying fire to their rangelands for maximum benefit.

CURRENT SCIENCE SPOTLIGHT

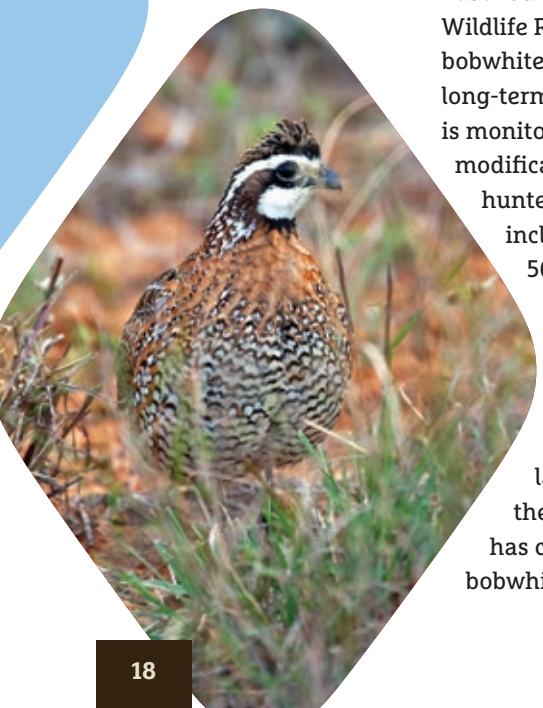
By Lindsay Martinez

OCELOT RECOVERY PLANNING AND FIELD RESEARCH

Momentum is growing in South Texas for new recovery efforts for the endangered ocelot. Through an exciting and collaborative effort, the East Foundation has partnered with eight organizations, including the Texas A&M University Natural Resources Institute, Texas Parks and Wildlife Department, and the U.S. Fish and Wildlife Service. Partner organizations are exploring the possibility of reintroducing new populations of ocelots back into parts of their historic but now unoccupied Texas range. Establishing additional ocelot populations in Texas is as important now as ever. A springtime wildfire on a neighboring ranch near the Foundation's El Sauz ranch impacted thousands of acres of potential habitat and highlighted the risks facing the 100 or fewer ocelots remaining in South Texas.

Meanwhile, crucial ocelot capture and sampling efforts continued in the field this year at El Sauz. East Foundation researchers, in partnership with the Caesar Kleberg Wildlife Research Institute and the University of Tennessee, live-trapped and released five ocelots at El Sauz this season. Two unique semen samples were obtained from male ocelots captured in the effort. Researchers are now exploring methods to use that genetic material to captively propagate a new generation of ocelots that could one day be reintroduced into unoccupied habitat in Texas.

SUSTAINABILITY OF HARVEST ON NORTHERN BOBWHITE POPULATIONS



East Foundation is continuing research initially begun in cooperation with the Caesar Kleberg Wildlife Research Institute on Northern bobwhites across the Foundation's ranches. Because bobwhites are an essential part of South Texas' natural heritage and outdoor recreation economy, long-term declines in bobwhites outside of South Texas are cause for concern. East Foundation is monitoring bobwhite populations over time, exploring quail hunting practices, exploring modifications to make helicopter-based quail surveys safer, and comparing quail numbers on hunted versus non-hunted properties. This year, the East Foundation expanded its research to include two additional hunted sites and one additional non-hunted site, with approximately 56,000 acres under investigation.

East Foundation is focused on assessing the sustainability of hunting norms in bobwhite management. Among these is the suggestion that landowners implement a 20 percent harvest limit for quail. Preliminary results suggest that prescribing a harvest quota is limited by the precision of the population estimate. Therefore, landowners should be conservative, reducing their harvest to 15 percent or applying the 20 percent limit to only their lower estimates of quail populations. This research has clear implications for wildlife managers in South Texas committed to conserving the bobwhite and maintaining successful quail hunting operations.

Photos left to right: Ben Master, Wyman Meinzer, Camryn Kiel

Agricultural Research Organizations

Partnering with university programs

The East Foundation was the first organization in the United States to be officially designated as an Agricultural Research Organization (or ARO), and as such, is directly engaged in the continuous active conduct of agricultural research. As part of this designation, we partner with land grant and other agricultural colleges and universities including the Texas A&M University system, as well as the Texas A&M Natural Resources Institute, the King Ranch® Institute for Ranch Management and the Caesar Kleberg Wildlife Research Institute at Texas A&M University – Kingsville. The Foundation also works with other universities across Texas and the United States.

PRESCRIBED BURNS AND THE TEXAS TORTOISE

The Texas tortoise is the state's only species of native tortoise. In a new collaboration with the East Foundation, Texas A&M University and Texas A&M University-Kingsville are investigating the effects of prescribed burns on the at-risk tortoise. Researchers are capitalizing on the existing prescribed burn regime at the Foundation's El Sauz Ranch to evaluate how fires and the seasonal timing of fires impact Texas tortoises. Prescribed burning is a common rangeland and wildlife management tool in South Texas, but this study is the first to assess how it impacts the Texas tortoise.

By attaching tracking devices to tortoises who are present prior to fire, researchers can trace individuals' survival during fire and their movements during and after a fire. Temperature loggers are also attached to tortoises to determine the magnitude of heat that they experience during fire. Researchers can then explore how a fire's temperature relates to tortoises' survival and movements. Additionally, by tracking tortoises for this project, researchers have the opportunity to study tortoise behaviors and habitat use. This will provide important ecological information about this often under-studied species.

RESEARCH at Geographic and Temporal Scale

THE COLORADITAS GRAZING RESEARCH AND DEMONSTRATION AREA

By James Powell

At more than 150,000 acres, the San Antonio Viejo Ranch is an immense piece of land, even by Texas standards. At about half the size of the city of San Antonio, it stretches 15 miles east to west, 20 miles north to south, and straddles two unique ecoregions – the Coastal Sand Plain, consisting of native grassland open plains with scattered mottes of dense mesquite and mixed brush, and the Tamaulipan Thornscrub, defined by dense, mixed brush with tight and rocky soils. These vastly different ecoregions are home to diverse populations of native wildlife and provide suitable forage for cattle.

The ranch's vast landscape and seemingly endless vistas are just the sort of inspiring features that plant the seeds for big ideas in the minds of science-minded managers who want to solve big problems. And so, due to its size and diverse composition and where it sits in South Texas, the San Antonio Viejo is also home to one of the Foundation's most important, and certainly its largest, long-term research projects, the Coloraditas Grazing Research and Demonstration Area (CGRDA). The Foundation has partnered with Texas A&M University and Texas A&M University-Kingsville to determine how best to manage these diverse but sometimes harsh native rangelands, wildlife populations, and cattle in a region where drought conditions occur often and can be particularly harsh and long lasting.

The Coloraditas Grazing Management Program, which takes place within the Demonstration area's 18,538 acres on the northern portion of the ranch, is predicated on a central hypothesis – that weather, ecological site characteristics, and grazing strategy interact to produce diverse vegetation structure, composition, and primary production characteristics that impact livestock productivity and wildlife population dynamics.

"Both livestock grazing and wildlife populations are reliant on the integrity and management of rangeland resources in a ranching system," said East Foundation Chief Science Officer Jason Sawyer. "For that reason, we seek to develop and evaluate grazing strategies that enhance the long-term value of private lands through rangeland stewardship that optimizes both livestock production and wildlife populations, and we are well-suited to doing this given our ability to conduct a study like this over many years and across a large, contiguous geography."

LEARNING FROM THE PAST TO INFORM THE FUTURE

The Project began in 2015, with Phase I of the study concluding in 2018. The Phase I study at the Coloraditas Grazing Research Demonstration Area used two stocking rates based on average forage growth expectation (35 acres per animal unit – in this case, an animal unit being a ~1,000 lb. cow) or a more conservative stocking rate to allow more forage carryover as a buffer against future risk (50 acres per animal unit). Each stocking rate was combined with either continuous or rotational grazing methods, yielding four grazing strategies. Each continuous grazing strategy was replicated, and while the rotational strategies could not be replicated due to limitations on the total number of pastures available, carrying the study over several years allowed repeated comparisons among the rotational groups. Notably, Phase I was intentionally designed with rigid stocking guidelines, such that stocking rate was fixed throughout the duration of the experiment. The only flexible element of the experiment was the timing of rotations, as well as the duration of grazing within each rotational pasture.

Outcomes from Phase I's intentionally rigid stocking guidelines are still being evaluated, and reports are released as analyses are completed. Broadly, Phase I illustrated the infeasibility of rigid grazing strategies in an environment characterized by highly variable precipitation patterns.

"One outcome from Phase I was data-supported confirmation that rigid and traditional grazing management strategies cannot persist for more than a few years without compromising livestock productivity, range condition, or both, especially when exacerbated by drought," said East Foundation Research Scientist Andrea Montalvo. "The combined drought and deterioration of range conditions led to declines in bobwhite populations as well as decreases in species richness, percent cover, and structure of grasses and forbs that bobwhites rely on."

Following livestock removal, final data collection from Phase I is providing quantitative data about the capacity of these sites to recover following the elimination of grazing. The data from Phase I are rich, due to the variation in vegetation at the time of grazing removal and variation in precipitation during the deferral period. Effects on livestock production have been evaluated, and effects on wildlife populations are being analyzed. While few effects of grazing method were observed, the drought conditions at the time were severe enough that neither stocking rate was sustainable, and the severity of the weather events moderated differences resulting from stocking rate.

"With rigid, fixed stocking rates, and the highly variable precipitation that occurs in this region, one of two things happened," added Sawyer. "In good years, neither stocking rate exceeded that capacity of the resource. But in drought periods, both stocking rates were too high to sustain range condition, so neither stocking rate was optimal and this did not depend on the grazing method."

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ADAPTIVE MANAGEMENT IN ACTION ON THE COLORADITAS

Currently, the Area is in Phase II of the long-term study, although the stated goal of the Coloraditas program remains the same - **to develop grazing strategies for sustainable rangeland utilization that optimize and improve livestock production, wildlife biodiversity, and amenity value of wildlife populations.** These evaluations will further the understanding of complex ecological systems and inform new strategies to enhance the long-term value of private lands through informed, effective, and sustainable resource stewardship. Synthesis of findings will generate valuable information for future management decisions.

Based on the key observations, Phase II is designed to evaluate adaptive grazing strategies. Adaptive grazing has many connotations, but lacks quantitative definitions, making consistent recommendations for implementation difficult. As a result, Phase II grazing strategies are built upon classic paradigms of grazing management (i.e., take half, leave half), but are now utilized in a more flexible and adaptive framework.

Additionally, due to the recognition that the duration of a phase may be short due to multiple factors, replication of all strategies within a phase is necessary. While year-on-year replication is still an objective, Phase II will not rely on this exclusively. To achieve the stated Project goal, several objectives have been established for Phase II:

- Develop and evaluate a 'quantitatively adaptive' stocking rate strategy based on harvest efficiency.
- Develop and evaluate a one-herd, three pasture, deferred rotational grazing method.
- Initialize a "total value" framework that includes livestock production capacity, wildlife values, and soil health/soil carbon accumulation as ecosystem service value indicators.
- Assemble Project data into a quantitative framework that allows description of responses of rangeland conditions, livestock productivity, and wildlife population dynamics to imposed grazing strategies, conditioned by precipitation.

To accomplish Phase II goals on the Coloraditas, livestock production responses are not the only important outcomes. The density and abundance of bobwhite quail, songbirds, small mammals, and white-tailed deer are monitored within and outside of the large grazing study to determine how different grazing systems and stocking rates affect rangeland habitat and populations. The Foundation also monitors fluctuations in forage standing crop, species composition, and vegetation structure inside and outside of the grazing study.

"This project is the largest of its kind, which speaks to the Foundation's ability to conduct research at scale and over long periods of time," said East Foundation President and CEO Neal Wilkins. "The Foundation and our partners expect the Project's long-term results will allow us to provide ranchers and landowners with useful information, which reflects the realities of all these range condition variables, to help make more informed management decisions that are adaptable to real-world conditions."

Phase II of the Project explores impacts based on three grazing strategy treatments:

- Continuous grazing with a target of 25% harvest efficiency
- Continuous grazing with a target of 12.5% harvest efficiency
- Rotational grazing with a target of 25% harvest efficiency

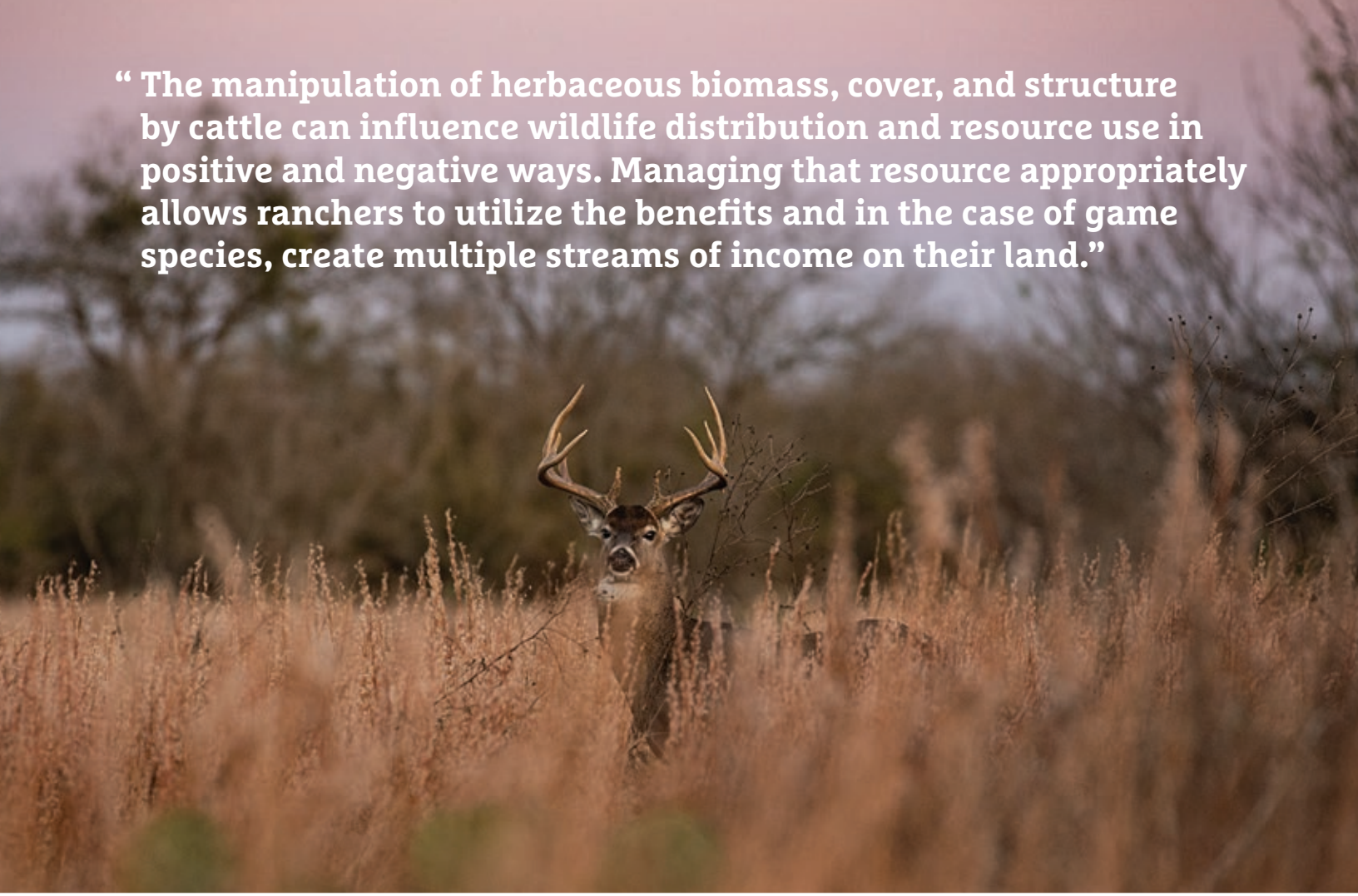
Stocking rate treatments are designed to place the Phase I treatments into a more adaptive framework. By allocating either 25% or 12.5% of forage for livestock consumption and setting the annual stocking rate based on these harvest targets, grazing pressure is maintained over time in balance with the productivity of the rangeland. At 25% allocation, this estimate is consistent with standard recommendations for 'moderate' stocking, while 12.5% allocation represents a 'light' or 'very light' stocking rate.

The stocking rates that result from this approach correspond closely to the Phase I treatments when forage conditions are close to average, but are changed each year, since 'average' conditions may actually be rare in South Texas – they are either better, or worse, and rarely exactly average. One of the goals of the project is to define strategies that allow optimum use of the resource while avoiding the 'boom and bust' cycles that can occur with fixed stocking rate strategies.

"During the day-to-day operations, rangeland is monitored in several ways," said Molli Foxley, the Foundation's assistant livestock manager responsible for assessing range conditions on the site. "Various data points are collected weekly such as range condition, cattle body conditions, fecal scores, and supplemental feed intake. These variables, in addition to monthly photo points, serve as supporting indicators for rotation. By continuously monitoring these variables, the more intuitive but valuable "rancher's eye" technique also has quantitative support."

Of course, any strategy has to be functional in the real world. Implementation of the project occurs in typical ranching conditions for South Texas, and part of the project is identifying challenges and barriers to operating adaptive

“ The manipulation of herbaceous biomass, cover, and structure by cattle can influence wildlife distribution and resource use in positive and negative ways. Managing that resource appropriately allows ranchers to utilize the benefits and in the case of game species, create multiple streams of income on their land.”



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systems in extensive landscapes. Livestock production is evaluated using standard production metrics for each cow herd. Cow weight change will be evaluated to estimate forage intake and compared with forage "disappearance" to estimate harvest efficiency. Within-group weight and weight change variance will be evaluated and compared as an indicator of forage availability, especially when comparing suitability of the grazing methods. All of these fit into normal operations and help us to develop tools that managers can utilize to support operational decision making.

MANAGING LIVESTOCK AND WILDLIFE INTERACTIONS

Monitoring wildlife species response to grazing strategies is another important component of the Coloraditas study. Monitoring is used both to create a long-term database of changes in abundance and species richness of game and non-game species, and to assess direct effects of grazing strategy selection and precipitation on populations over time.

"The manipulation of herbaceous biomass, cover, and structure by cattle can influence wildlife distribution and resource use in positive and negative ways. Managing that resource appropriately allows ranchers to utilize the benefits and in the case of game species, create multiple streams of income on their land."

To monitor wildlife populations, aerial surveys for northern bobwhites are conducted each November via helicopter. Coveys are counted within the CGRDA and three reference pastures. Surveys for large mammals (white-tailed deer, nilgai, feral hogs, and javelina) are flown via helicopter each February within the CGRDA. Density and abundance of bobwhites and large mammals are analyzed using distance sampling methods. Species richness and abundance of small mammals are determined from 10 trapping grids within the CGRDA and 20 control grids outside of the treatment area from February to March each year. Species richness, abundance, and productivity of breeding birds is collected within the CGRDA from April to July each year.

WHAT THE FUTURE HOLDS

Results from Phase II will address hypotheses related to effects of adaptive grazing strategies on indicators of wildlife value, livestock production value, and rangeland condition. Because both treatment and response variables can be expressed quantitatively, they will be (where possible) aligned with Phase I data for the description of key relationships. Interim reports during Phase II will describe project progress and report on embedded studies, especially forage growth and disappearance relative to precipitation, exploration of distributions of forage growth and use as risk indicators, and other opportunities that will be identified as shorter duration, spinoff projects.

"Ultimately, Phase II findings will be used to identify priority objectives for Phase III," said Sawyer. "This will ensure that the Program goal of creating a series of related, repeatable, and ongoing large-scale grazing experiments is realized for the benefit of managers on working cattle ranches across South Texas." ◊

M the Future

Behind the Gates 2022 IN PHOTOS

By Allison Biedenharn

Students from IDEA public schools in Cameron and Hidalgo counties are invited each year for a day-long learning experience on the El Sauz Ranch near Port Mansfield, Texas. This past October, more than 1,500 fifth grade students hopped off the bus for the first Behind the Gates held at the Elliff-– El Sauz Education Center. The newly constructed facility hosts a pavilion and six covered stations for the students to break into groups and rotate through the lessons.

Behind The Gates is a unique opportunity for students to visit a working ranch and learn about cattle ranching, endangered species, wildlife management and conservation efforts, historical land use of South Texas, and many land stewardship and range management principles. The interactive, Science TEKS-aligned lessons presented at Behind the Gates encourage students to connect with the natural world while participating in first-hand, and even hands-on, outdoor learning experiences.

Behind the Gates is proudly sponsored by Las Huellas.

The Elliff-El Sauz Education Center is proudly sponsored by Elliff Motors, Enbridge, Makena, Texas Regional Bank, Frost Bank, Roy W. & Ellen S. Quillin Foundation, Wildlife Systems, H. Yturria Family, Las Huellas, and the East Foundation Board of Directors.

Photos: Jonathan Vail


East


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Our People

Just as every ranch survives and thrives based on the passion and perseverance of those stewards who work the land and tend the cattle, every successful organization is only as good as its people.

RECENT HIRES

Richard Douglas
March 2022
As Security Manager, Richard designs and implements strategies that ensure the safety and security of East Foundation staff and guests, as well as prevents and deters property loss and damage to East Foundation lands, facilities, and other assets. He joined the Foundation from the United States Border Patrol, where he most recently served as the RGV Sector Program Manager. His career in law enforcement has spanned over 25 years and includes 16 years with the Federal Air Marshall Service.

Joe Guillen
April 2022
As our Fleet Manager, Joe runs the shop on the San Antonio Viejo with a goal of maximizing the uptime of our entire fleet. He joins us from Rush Enterprises in Laredo where he served as Shop Foreman and Certified Lead Mechanic. Joe brings over 20 years of heavy equipment repair and fleet maintenance experience to the Foundation.

Jason Sawyer
June 2022
Jason Sawyer joined the East Foundation as our Chief Science Officer. He leads our science team and works closely with our university partners, providing oversight and support for the Foundation's science program and its integration into ranching. Prior to joining us at East Foundation, Jason was an Associate Professor & Research Scientist at the King Ranch® Institute for Ranch Management. He has a B.S. in Rangeland Ecology and Ranch Management from Texas A&M University, and M.S. and Ph.D. degrees in Range Nutrition and Beef Cattle Management, both from New Mexico State University. Jason has served in extension, teaching, research, and management roles, and he has authored or co-authored over 120 peer-reviewed and invited publications, over 250 abstracts, proceedings, and technical reports, and given presentations at more than 125 local, state, and national meetings.

PROMOTIONS

Isha Anes
As East Foundation's Technology Specialist, Isha Anes assists with all of our IT needs. She works in close coordination with our technology services provider; Knight Office Solutions, to ensure our employees' technology needs are met. In addition, Isha works with our Information Systems Manager on special projects and provides administrative support as needed. Isha brings over 15 years of administrative and records management experience to the Foundation.

Allison Biedenharn
As our Communications & Outreach Specialist, Allison Biedenharn focuses on the combination of communications, outreach, and education. She coordinates the activities of the Digital Content Team, developing content in support of communication efforts from social media to press releases to website. She also supports the development and delivery of education content such as virtual field lessons, Behind the Gates, the Land Stewardship Ambassadors San Antonio cohort, and classroom activities. Allie has a B.S. in Renewable Natural Resources and Spatial Sciences from Texas A&M University. She is currently working on her M.A. in Integrated Marketing Communications from West Virginia University.

Jason Haynes
With increasing demands throughout the past several years and the expansion of our facilities footprint, Jason has shifted his focus to the maintenance and upkeep of our facilities. As Facilities & Logistics Manager he is responsible for maintaining facilities and ensuring equipment is where it is needed when it is needed. Prior to joining the East Foundation, Jason served 20 years in the United States Army where he completed four combat tours in Iraq and Afghanistan. During his service Jason was awarded three Bronze Stars, an Army Commendation Medal for Valor, and numerous other commendations.

Eddie Reyna
As East Foundation's Ranch Operations Manager, Eddie Reyna is responsible for executing the Foundation's priorities across two areas — cattle operations and

ranch infrastructure. He oversees the ranch labor force and allocates resources for cattle workings and the maintenance and development of fences, roads, water systems, and right-of-ways. Eddie has a B.S. in Animal Science from Texas A&M University-Kingsville.

Kristine Robb
Kristine Robb works at the intersection of communications, technology, and sponsorship development. As Information Systems Manager, she ensures technology, records management, and archival solutions match the priorities of the Foundation. In addition, she supports the creation and delivery of materials that effectively translate the activities of the Foundation to a diverse audience fostering brand alignment for future program sponsors. Kristine has a B.A. in History and M.A. in History with emphasis in Public History, both from Texas State University.

Garrett Stribling
Garrett Stribling is the Ranch Business Manager for the East Foundation. In this role he is responsible for leading the business enterprise of the ranch with a focus on efficiency and productivity. He develops and implements strategies focused on herd improvement, managerial accounting, marketing, and finance. Garrett has a B.S. in Animal Science from Texas A&M University and a M.S. in Ranch Management

RETIREMENT

Matt Robinson
Matt Robinson retired in June 2022 after an invaluable career with the East Foundation.

As our Security Manager, Matt was responsible for securing the Foundation's properties and assets, including the safeguarding of employees, research personnel, and our natural and wildlife resources. He coordinated closely with neighboring landowners and local law enforcement. Prior to his employment with the Foundation, Matt spent 31 years as a Texas Parks & Wildlife Department Game Warden. He spent most of those three decades working with professional law enforcement throughout South Texas and has a B.S. in Wildlife & Fisheries Sciences from Texas A&M University. After some well-deserved vacation time, we are fortunate that Matt will return to work with us in another capacity as Unit Maintenance Foreman.

Alfonso "Poncho" Huerta
Alfonso "Poncho" Huerta retired in July 2022 after a long and varied career with the East family and the East Foundation. Poncho began working for the East family when he was 14 years old. During his time on the ranches he's lived at Buena Vista, San Antonio Viejo, and El Sauz. While he was employed by the East family, he lived on the south end of San Antonio Viejo at Casa Verde where he took care of the sheep and goats in addition to his other duties.

Poncho has worked on both the windmill and fence crews and for several years he lived on El Sauz as the only full-time employee there checking cattle, water troughs, and fences throughout the ranch. A resourceful repairman, Poncho spent a lot of his life figuring out how to make things work with limited resources. We at the East Foundation are lucky to have worked alongside Poncho and wish him well in his retirement.

Our employees help us meet our land stewardship mission today, tomorrow, and for years to come. Here are some highlights on the Foundation's recent hires and promotions, as well as news regarding well-earned staff retirements.

A RARE ASSET

PROMOTING THE ADVANCEMENT OF LAND STEWARDSHIP THROUGH EDUCATION

By Lorie A. Woodward

A 217,000-ACRE LIVING LABORATORY IS A RARE ASSET FOR RESEARCHERS PURSUING SCIENCE-BASED ANSWERS TO PRESSING LAND MANAGEMENT QUESTIONS.

"The East Foundation is an operating cattle ranch with a science mindset," said Dr. Jeremy Baumgardt, Assistant Professor for Research with the Caesar Kleberg Wildlife Research Institute (CKWRI). "You don't find research land on this scale anywhere, and because the land is privately owned, there is a degree of control, certainty, and decision-making power that is extremely rare on public land."

While the Foundation joins forces with a host of like-minded research partners from universities, agencies, and NGOs to explore a wide variety of concerns, all of its science efforts are driven by a quest to improve the productivity and health of the livestock, the wildlife, and the working native rangelands.

Ultimately, the Foundation's science program exists to ask questions and find answers that directly influence both livestock and land management decisions on ranches and natural policy decisions in the halls of government.

"Frankly, we like to be on the applied side of things," said Landon Schofield, a Range and Wildlife Biologist for the East Foundation. "If new knowledge just sits on a shelf in a book and doesn't contribute to positive decisions and change in the real world, then it's sort of for naught."

Sheer size and scale, which allows scientists to consider variables not apparent on small research plots, is not the Foundation's only research attribute. Its land is divided among six ranches spanning parts of Jim Hogg, Kenedy, Starr, and Willacy counties. The native rangelands encompass a variety of ecosystems, ranging from Tamaulipan Thornscrub and the Coastal Sand Plain to Coastal Marshes, showcasing the ecological diversity of South Texas and creating an opportunity for scientists to compare and contrast experimental results in different environments.

The ranches are home to more than 625 wildlife species, including one of the state's largest un-hunted and un-managed whitetail deer herds and one of its rarest denizens, the ocelot. And all of this is set within the framework of a historic, working cattle ranch.

These unique features come into play as the staff is determining where to focus the Foundation's research efforts.

"One of the filters we use as we're choosing and prioritizing the projects we take on, is the question: Are we uniquely positioned to tackle this?" Schofield said. "If no one can answer a particular management question better than us, then it's something that we'll seriously consider."

For instance, the Foundation dedicated more than 18,000 acres of native rangeland on their San Antonio Viejo Rranch to the Coloraditas Grazing and Research Demonstration Area, a designated long-term comparative grazing study area, to determine the best grazing strategies for harsh South Texas environments. The grazing study overlaps with on-going work regarding coyotes, white-tailed deer, and rangeland monitoring.

The Foundation, which, thanks to land stewardship efforts begun by the East family, has rare ocelots on its El Sauz Ranch, is also spearheading research key to conserving the endangered (in the U.S.) species. The science team has successfully developed techniques that allows researchers to collect and store semen from wild males that can then be used to artificially inseminate captive females and diversify the species gene pool. The long-term goal is the reintroduction of genetically vigorous populations into suitable habitat across a larger portion of South Texas.

To leverage its manpower and financial resources, the Foundation engages with like-minded research partners. When applicable, the staff identifies principal investigators, many of whom are university professors who are training graduate students. While the principal investigators have different research interests and areas of expertise, they all have a proven track record of creativity and practical, useful results.

"Our working relationship are built on mutual interests, respect, honesty, and curiosity," Schofield said. "We seek out innovative people whose curiosity will push the question and existing methodology to its limit and put our living laboratory to full use."

And, unlike many research partnerships that are "one and done," the Foundations seeks to establish long-term relationships.

"We all benefit if we can continue to draw on the intellectual resources of a network of creative, innovative scientists, both principal investigators and graduate students," Schofield said. "By enlisting the talents of graduate students, we're helping develop the next generation of management-minded natural resource leaders."

Identifying and cultivating talent is an important by-product of the Foundation's research efforts.

"Somebody somewhere—and it might as well be us—is training the next Secretary of the Interior or Secretary of Agriculture, the next Chief of NRCS (Natural Resources

Conservation Service) or Executive Director of Texas Parks & Wildlife, and the next managers of our large-scale ranches," said Dr. Neal Wilkins, President and CEO of the East Foundation. "We are purposely creating a cadre of effective, well-informed, multi-faceted leaders who will be a legacy that extends beyond our fence lines."

Long-term relationships highlight another advantage inherent in the East Foundation's living laboratory situated across six working cattle ranches – the luxury of time. In traditional natural resource research settings, projects usually last for two to four field seasons depending on whether the investigator is working towards a master's degree or a doctorate. On East Foundation lands, projects can continue indefinitely, evolving over time in response to answered questions that prompt new ones to explore.

"Once the initial question is answered, we can pivot in a new direction or shelve what we've learned until we need to pick it up again," Schofield said. "The flow is never exactly the same."

Time, combined with tight control of the research agenda and the land resources, also allows East Foundation scientists and their partners to layer new questions and new findings on top of each other to create a more comprehensive picture.

"THE VARIABLES IN PLAY OVER THE LANDSCAPE AREN'T INDEPENDENT, BUT INTERCONNECTED. BY LAYERING OUR NEW KNOWLEDGE IN EACH AREA ON TOP OF OUR EXISTING KNOWLEDGE, WE CAN BETTER UNDERSTAND ALL THE PIECES IN PLAY."

A prime example of knowledge layering is a new research study, involving the East Foundation, CKWRI, and the Texas Animal Health Commission among others, which is exploring the relationship between nilgai antelope, white-tailed deer, and cattle, the three known hosts of cattle fever ticks. Fever ticks carry a pathogen that infects cattle, destroying their red blood cells resulting in anemia, fever, and death, as well as potential economic devastation for the cattle industry. Fever ticks also affect the transport of wildlife hides and horns, which impacts commercial hunting, another important land-based enterprise.

The ticks, which once made their way north into 15 states during the historic cattle drives of the past century, have been pushed back to deep South Texas and held in check in a closely monitored quarantine zone for nearly 80 years. In the past 15 years, outbreaks outside the quarantine zone have increased.

The suspected culprit? Wildlife, particularly nilgai antelope. Effective, albeit expensive and time-consuming, pharmaceutical treatments exist for cattle and white-tailed deer, but not the exotic nilgai, an import originally from South Asia.

The first nilgai released in Texas in the 1920s came from U.S. zoo stock. Although the population has been steadily increasing throughout South Texas since the 1940s, little was known about their basic biology. East Foundation scientists set out to uncover their natural history and discovered among many things that the antelope have large home ranges and cover great distances. In one recorded instance, one nilgai that dispersed traveled a path of more than 100 miles in two months. It eventually settled outside the Preventative Temporary Quarantine Area, 23 miles from where it was captured. The tick's life cycle is three to four weeks, so it is conceivable that nilgai could move into a new area and establish ticks in untreated cattle herds.

As another consideration, traditional fences don't present an obstacle for nilgai that generally weigh between 220 pounds to 635 pounds. Instead, they prefer to "push" under them, which can cause extensive damage and create opportunities for cattle to escape if the fences aren't repaired immediately. To further complicate potential treatments, Baumgardt, working with partners confirmed the nilgai, unlike cattle and white-tailed deer, will not visit feeders or eat treated feed.

Additional work was done to determine whether either of two predominant nilgai behaviors, using common dung piles known as latrines and crawling under fences to cross them, offered a viable opportunity to administer a treatment option. Scientists discovered that the dung piles were too numerous and too far-flung to have potential. Initially, the fence crossings seemed to be a good alternative, but when crossings were equipped with motion-activated insecticide sprayers the antelope avoided those crossings.

In the meantime, the people who were "scratching" wildlife and cattle in the quarantine zone reported a "mopping up" effect. In areas where treated cattle and wildlife overlapped, the tick loads on the wildlife were lower than in areas where wildlife weren't exposed to treated cattle.

This observation, along with the other findings, prompted the current study, which involves collaring an equal number of nilgai, whitetails, and cattle and analyzing their movements over time as they share common ranges on the Laguna Atascosa Wildlife Refuge and several ranches throughout South Texas.

The project kicked off on the East Foundation's El Sauz Ranch in late 2021. Teams have been collaring animals on additional ranches since then. Data will be collected on each ranch for a year from its start date.

"We're trying to determine if there is an opportunity to manage one species to help mitigate the threat in terms of other potential hosts," Schofield said. Baumgardt added, "It's a numbers game."

Of the thousands of eggs that a tick lays the probability that an egg will hatch, mature, find a host and a mate and reproduce is less than 1 percent, he explained. If that probability can be cut in half by disrupting any step in the tick's life cycle, then the tick population will start a significant downward trend that lends to control, he said.

The data will be analyzed to determine where the animals intersect, and if there is any resulting difference in tick loads. Researchers will also attempt to identify any areas such as extremely thick brush that cattle routinely avoid, but wildlife frequent. Scientists will follow up to determine if those areas serve as tick reservoirs, with the hope that they can eventually develop land management recommendations that could reduce the presence of those tick reservoirs if they exist.

In addition, different ranches are using different methods to treat their cattle. For instance, one ranch in the study is employing molasses tubs infused with Ivermectin, while another is regularly rounding up its cattle herd and treating with an injectable prescription. Investigators are going to see if there is any discernible difference in wildlife's tick loads based on the type of cattle treatments.

"We still have a lot to learn and a lot of questions to ask," Baumgardt said.

Outside of South Texas, at least in Baumgardt's experience, livestock producers tend to view fever ticks as a regional problem. However, scientists are concerned that rising temperatures among other variables could expand the range of the nilgai as well as the fever tick, bringing the disease to people's front gates in an expanding geographic range.

"While it's good that people have been protected enough to be complacent, it's pretty short-sighted not to take this threat seriously because it has serious implications for the sustainability of the cattle industry," Baumgardt said.
In South Texas, no one—neither ranchers nor researchers—is dismissing the urgent need for useful information and sound management strategies.

"We're continuing to learn, be flexible and seize opportunities to answer pertinent questions," Schofield said. "We want to do what is right for land stewards, so they can continue to do what is right for the land, the livestock, and the wildlife—and benefit us all."

East FOUNDATION

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Engaging with like-minded Sponsors is an important aspect of the East Foundation's mission to promote the advancement of land stewardship through ranching, science, and education.

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Together, we educate and promote future leaders, professionals, and conservation-minded citizens who will appreciate, value, and support Texas' rangelands, as well as the private land stewards who make Texas such a vibrant, diverse, and unique place for people and wildlife to live. A special thanks to the following Sponsors that have invested in the East Foundation's mission and programs in the past year:

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East Foundation engages with like-minded partners, both at the individual and organizational level, to fulfill our mission. Our partners consistently demonstrate a commitment to excellence in land stewardship and education regarding the conservation of our natural resources.

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