



Wildlife Research

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at Texas A&M University-Kingsville

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Establishing Native Grasslands: Relationships Between Native Seedings and Invasive Species Encroachment

*by Hayden Taylor, Anthony Falk,
and Kory Nickell*

Texas is full of unique ecoregions, but few are as special as the coastal prairies — an area once covered in large native grasslands. Efforts to restore native plant communities along the coast face huge challenges from invasive species such as Old-World bluestems. One question facing the coastal prairies region is whether native seedings reduce invasive species abundance and keep them from reinvading.

To support native plant establishment at a large scale, the Texas Native Seeds Coastal Prairies region (TNSCP) is developing locally adapted native seed for use in the region. Native seedings can be a costly endeavor for landowners; therefore, suitable native varieties are required to ensure successful plantings. Currently, evaluations of purple lovegrass and yellow puff are being conducted, as these species are early-establishing and capable of supporting wildlife. We might consider these species as “sprinters”—plants that can reach germination and maturity before invasive species dominate. With species development focused on perennial grasslands, we often must look backwards at the unsung heroes before moving to our big four prairie grasses for establishment.

Research plantings done in partnership with the Harris County Flood Control District have yielded results on relationships with native seedings and invasive species. Over the past five years, we have conducted native seedings on several of the Flood



Hayden Taylor

A successfully established native grassland in the bottom of a newly constructed basin.

Control District’s stormwater detention basins. Some basins were newly built and had bare soil; others basins were converted from bermudagrass and Old-World bluestems. As an overarching observation at all experimental basins: where there is bare ground, there will soon be Old-World bluestems. However, in newly built basins where successful seedings have occurred, they appear to prevent the spread of these invasive species into their space.

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In one particular basin, the Aldine Westfield Stormwater Detention Basin, seeded native species of Indiangrass, white tridens, herbaceous mimosa, Indian blanket, and Cajun ashy sunflower comprised 70% of observations. For this planting, Old-World bluestem observations were around 1%, although it surrounds the entire planted area. In contrast, another stormwater detention basin in the Willow Creek watershed had a successful seeding in prior years comprised of little bluestem, Hall's panicum, brownseed paspalum, and white tridens. This basin maintained the integrity of native species densities until frequent mowing occurred, resulting in 30% Old-World bluestem coverage. Although these basins vary widely, our data show that successfully seeded basins will hold their integrity until disturbed by an external force such as mowing.

Going back to our main question, we have concluded that two things go into making a native planting successful and keeping it that way:

- Use proven, local seed that's adapted to the site.
- Follow-up management is just as important.

Every acre established with proven native varieties is one less acre that invasive species can dominate. Native seed development is the main priority of TNSCP, driven by commercial demand for varieties that germinate quickly, cover ground fast, and fit local climates. As unpredictable as grassland restoration can be, the better our seed sources are, the more predictable it becomes. When we pair proven seed with consistent management, we have found that we can turn restoration from a gamble into a proven success.

Hayden Taylor is Texas Native Seeds, Assistant Director - Coastal Prairies, Dr. Anthony Falk is the Dan L Duncan Endowed Director of Texas Native Seeds, and Kory Nickell is Turf Establishment Coordinator at Harris County Flood Control District. ~



Drill rows of new seedlings 30 days following seeding in the same basin as the picture on page 1.

CKWRI News

Conservationist of the Year

CKWRI's very own Caroline Cage, Director of Donor Relations, is being honored as the 2026 Harvey Weil Professional Conservationist of the Year by the Corpus Christi Rotary Club. For over 20 years, Caroline has engaged donors and raised money in support of Texas Wildlife Association and the CKWRI. Everyone who works in conservation or who cares about wildlife and its habitat in Texas has benefitted from Caroline's efforts.



Caroline Cage

Intern News

Thanks to generous support from H-E-B, interns Riley Griffin and Rebekah McPeck were able to conduct ocelot research for CKWRI. We thank H-E-B for investing in ocelot conservation while providing meaningful and hands-on experience for future leaders in wildlife conservation. We look forward to hosting additional interns through the H-E-B Ocelot Intern Program.



What Do They Eat?

In Texas, red foxes (*Vulpes vulpes*) eat primarily rabbits, hares, and mice, and they also consume fruits and berries. (Hall, S. 2020. Texas Wildlife Identification Guide. Red fox. Texas Parks & Wildlife Department.).

C-SALT

by Aditya Singh

South Texas is a unique ecological crossroads, a vast landscape of thornscrub and rangelands that is home to nearly 70% of Texas' vertebrate species, from the northern bobwhite to the endangered ocelot. The sheer scale of this region makes traditional, ground-based research difficult, expensive, and logistically complicated. To meet these challenges, the CKWRI is embracing a new generation of high-tech tools to map and understand the landscape like never before.

At the forefront of this change are unmanned aerial vehicles (UAVs), or drones. These agile “eyes in the sky” can safely access remote terrain and capture ultra-high-resolution imagery, offering a level of detail far greater than satellites. Drones are more cost-effective and flexible than manned aircraft, allowing scientists to conduct rapid, repeatable surveys to track environmental changes, such as vegetation regrowth after a prescribed burn. Mounted on these drones, advanced sensors provide data beyond the limits of human vision. Light Detection and Ranging (LiDAR) sensors mounted on CKWRI's newly-acquired heavy lift drone functions like sonar, but uses laser pulses to create stunningly detailed 3D maps of the environment. LiDAR's most powerful feature is its ability to penetrate vegetation canopies, mapping both the treetops and the bare ground beneath. This reveals the true three-dimensional structure of an animal's habitat, a primary factor in its survival and well-being.

Another key technology being explored, hyperspectral imaging (HSI), captures information across hundreds of narrow bands of light, many invisible to the human eye. Every material, from a specific plant



Aditya Singh

CKWRI's newly-acquired heavy-lift UAV can carry 15 lbs of instrumentation payload and fly for 45 minutes, enabling research using LiDAR and hyperspectral sensors

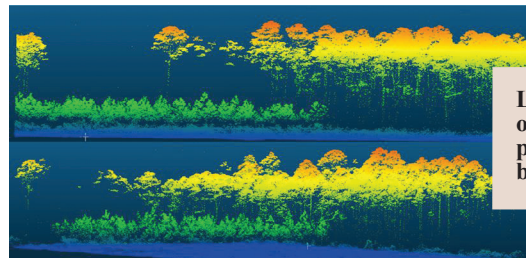
Did You Know?

The Neches River Rose-Mallow (*Hibiscus dasycalyx*) is a federally and state threatened species. It is also a Texas endemic species, only known to occur in Cherokee, Trinity, Harrison, and Houston Counties. (Texas

Parks & Wildlife Dept. Listed Plants of Texas. Neches River Rose-Mallow. https://tpwd.texas.gov/huntwild/wild/wildlife_diversity/nongame/listed-species/plants/neches_river_rose_mallow.phtml).



species to a type of soil, reflects light in a unique way, creating a distinct “spectral signature.” By analyzing these signatures, researchers can identify plant species with high accuracy, map the spread of invasive plants, and even detect vegetation stress from drought or disease long before it becomes visible. The true potential of these new remote sensing technologies is unlocked when these technologies are fused. Combining 3D LiDAR with HSI can create a synergistic, multi-layered view of the ecosystem—a “digital twin” of the habitat. LiDAR acts as the architect, building the 3D model, while HSI acts as the inspector, “painting” it with rich details like species identification and health.



LiDAR imagery of a southern pine forest taken by Dr. Singh.

CKWRI's Spatial Analytics Laboratory and Technology hub (C-SALT) is pioneering the use of these fused data streams to understand wildlife habitat and landscape resilience. The ultimate goal is to translate these complex data into actionable knowledge for the private landowners who are the primary stewards of South Texas' wildlife. These tools have the potential to provide property-specific information to guide decisions on brush management, grazing, and habitat restoration. By creating dynamic digital models of the landscape, researchers can shift conservation from a reactive to a proactive and predictive approach, ensuring this vital ecosystem thrives for generations to come. ~

Dr. Aditya Singh is Assistant Professor of Geospatial Ecology at the CKWRI. ~

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

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Meredith Long Intern

Presley Griffin recently completed her Meredith Long Wildlife Internship with CKWRI. Her research focused on attaching backpack-style GPS transmitters on adult great egrets, reddish egrets, and tricolored herons. Transmitters will show which habitats birds prefer during the breeding season, and describe wintering behavior after migration.

By The Numbers

54 - 59

The average wingspan in inches of the black vulture (*Coragyps atratus*). (Cornell Lab. All About Birds. Black Vulture. https://www.allaboutbirds.org/guide/Black_Vulture/id).

The CKWRI Science Team members on day two of their fall faculty meeting with their haul after a fun day of fishing in Port Mansfield.



Advisory Board

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

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