SOUTH TEXAS WILDLIFE

A publication of the Caesar Kleberg Wildlife Research Institute
at Texas A&M University-Kingsville

Fall 2018
Volume 22, No. 3

Pipeline right-of-way restoration is a major source of demand for native seeds. © Keith Pawelek

DEMAND FOR NATIVE SEEDS SHAPES TNS GROWTH

by Forrest S. Smith

Texas Native Seeds (TNS) recently expanded efforts to develop native seed supplies to the whole state. What conservation needs are we seeking to meet with this expansion? This is best answered by a "trip across Texas," outlining demand for native seeds. First lets look at where our work with native seeds started—South Texas.

South Texas is the epicenter of restoration efforts using native seeds because of the long running *South Texas Natives* Project. Native seed applications are increasingly related to energy exploration, development, and production. Demand for Eagle Ford Shale-related restoration has slowed, though previous surface use agreements dictating use of native seeds remain.

Other energy-related seed use is associated with wind farms and electric line right-of-ways. Lately, pipelines are the largest demand driver. Often, these projects are measured in scales of hundreds of acres or more. Other seed demand in South Texas is from wildlife habitat restoration projects, notably for quail, but also, increasingly to benefit pollinators and monarchs. Native seed mixes for range restoration in South Texas are desired, though use of cheaper non-native grasses, namely buffelgrass and Kleingrass, remains an obstacle. Finally, use of native seeds by the Texas Department of Transportation (TxDOT) is a steady source of year-to-year demand in South Texas.

In West Texas and the Permian Basin, the explosive increase in oil and gas production and construction of pipelines underlies the majority of current native seed demand. Native seed use in tandem with renewable energy production, particularly solar farms, is also apparent. Focused conservation efforts in previously undisturbed locations of the Trans-Pecos, particularly in the Alpine High, have recently put a spotlight on the need for greater seed provision for restoration needed to prevent energy sprawl impacts on habitats.

Editor's Note: Mr. Forrest Smith is the Dan L Duncan Endowed Director of the *South Texas Natives* Project and is the Texas Native Seeds Program Director at the Caesar Kleberg Wildlife Research Institute.

This Issue

© Forrest Smith

Native seeds are being required by TxDOT for right-of-ways throughout parts of Texas.

Several challenges must be addressed to realize widespread use of native seeds for rangeland restoration in West Texas. Foremost, cost of restoration on land with low productivity potential and modest per acre value is hard for some to reconcile. Additive to cost, aridity of the region results in a widely-held perception that range reseeding cannot be done in West Texas. Our research so far indicates seed-based restoration may actually be very successful in some areas, in part, because of the lack of competition from non-native grasses. In the rest of Texas, stands of non-native grasses are a significant hurdle to overcome. We think lower costs for rangeland restoration projects will eventually be achieved by market growth to meet the needs of the energy industry.

In Central Texas, native seed demands are closely related to the rapidly developing and fragmenting landscape. Even though restoration efforts are often small in scale compared to West or South Texas, the large population of conservation-minded landowners and higher land values associated with recreational land use results in significant demand for native seeds. Related to development, we have fielded requests for native seed mixes from golf courses, resorts, housing subdivisions, and wineries. TxDOT's demand for seeds in this region is also significant because of expanding transportation networks.

The Central Texas region is also impacted by energy development, directly from wind farms and some mineral exploration, but especially from right-of-ways connecting West Texas energy production to population centers. Finally, prairie restoration on former croplands in the blackland prairie and North Texas also is a driver of seed use.

In East Texas, interest in understory restoration of longleaf and shortleaf pine stands is occurring and represents a major need for native seeds for the Pineywoods region. Other major seed needs are for conversion of bermudagrass pasture to native prairie, for energy and transportation right-of-ways, and for mine reclamation.

Coastal Prairie needs are lately focused on suburban projects, especially for flood mitigation in the greater-Houston area. Other demands for native seeds mirror those apparent in Central Texas, with a particular focus on restoration of green infrastructure on public lands. Interest in restoration of former croplands and flood mitigation is also significant. TxDOT has been extremely supportive of our expansion into East Texas and the Coastal Prairies, as few reliable, large-scale native seed options are available for either region.

© Forrest Smith

Use of native seeds in restoring former oil and gas pad sites is driving demand in many regions of Texas.

Underlying the TNS mission is the realization that native seed supply is a major limiting factor to restoration efforts throughout much of Texas. We are thankful for the opportunity to work each day to reduce this constraint and are grateful for your support to do so. ~

By The Numbers

4–5	number of eggs in a clutch of the Bullock's oriole (Handbook of Birds of the World, Vol. 16, del Hoyo et al., Lynx Edicions)
9.5–11.2	length range in inches of adult Laredo striped whiptails (A Field Guide to Texas Reptiles & Amphibians, R.D. Bartlett and P.P. Bartlett, Gulf Publishing Co.)

CKWRI NEWS

New Memorial Fund Established

We are pleased to announce the creation of the *Holt/Atherton Memorial Fund for Wildlife Research and Education* through a gift from the **William Knox Holt Foundation**. The new fund is in memory of **William Knox Holt**, **B. D. Holt**, and **Holt Atherton** and celebrates their historic connections to the King Ranch, where their caterpillar tractors, adorned with the famous "Running W" brand, cleared brush for early wildlife management beginning in the 1950s. William Knox Holt Foundation president **Geary Atherton** told **Dr. Fred Bryant** that the collaboration in South Texas 60 years ago resulted in a new tractor and root plow combination for clearing brush that is still used today.

When Atherton's great-grandfather **Benjamin Holt** invented the continuous-track caterpillar tractor in Stockton, California in 1904, he was looking for a way to farm peat bogs in the Central Valley. The inventor's son, **William Knox Holt**, brought the W. K. Holt Machinery Company to Texas in 1933, and his 2 nephews, **B. D. Holt** and **Holt**

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

Atherton, joined him in the 1950s. "They enjoyed hunting in South Texas with many close friends from the King Ranch," Atherton explained, "and they all shared an interest in wildlife management. There were no peat bogs, but there was lots of brush. To meet the challenge, a special 'Super Dozer' was developed. It was a double tractor, the Twin D8, equipped with a special funnel blade that forced the brush into the center of the machine, and it was fitted with an extra-wide Holt root plow that was cable operated."

"Those friendships have continued with my generation," Atherton explained, "and they extend today to the next generation of family

© Catherine Cooke Atherton

The old Holt caterpillar tractor adorned with the "running W" brand.

members, including **Corrina Holt Richter** and **Peter John Holt**, who operate San Antonio-based HOLTCAT. The William Knox Holt Foundation is excited about this new memorial fund that honors this rich history and supports the amazing work of the Caesar Kleberg Wildlife Research Institute."

Graduate Student Recognized

Nicole Traub, Ph.D. student working with **Dr. Alan Fedynich** on a quail parasite project in South Texas, was awarded the 2018 Southwestern Association of Parasitologists Student Research Award for $250 at the society's 51st Annual Meeting held April 19–21, 2018 at the University of Oklahoma Biological Station at Lake Texoma, Oklahoma. Congratulations, Nicole! ~

Did You Know?

Paired Montezuma quail are involved in raising their brood. (Chapter 3: Montezuma Quail Ecology and Life History by Harveson et al. In Texas Quails Ecology and Management, L.A. Brennan editor, Texas A&M University Press)

Most toads have a gland on their shoulder that secretes venom to discourage predators. (A Field Guide to Texas Reptiles & Amphibians, R.D. Bartlett and P.P. Bartlett, Gulf Publishing Co.)

THE DANGER OF SUMMERTIME HEAT FOR QUAIL

by Timothy Fulbright

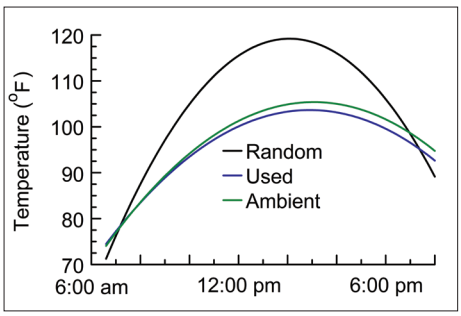
Wildlife live outside where there are no air conditioners. You might think hot days are no problem for them. After all, they should be well adapted to heat. In reality, extreme heat is dangerous for many wildlife species just as it is for us. For bobwhites and scaled quail, heat stress reduces reproduction and survival.

Both species of quail experience hyperthermia around 102°F. Hyperthermia, or elevation of metabolism and heart rates in response to heat, partially helps to offset the negative effects of high temperatures. However, increased metabolism alone is insufficient to tamp down core body temperatures as the environmental temperature increases. Quail lack sweat glands and their feathers impede evaporation from their skin. The only way they can take advantage of evaporative cooling is to open their mouth and "flutter" their neck muscles, which promotes heat loss through evaporation of moisture.

A problem with using evaporative heat loss to stay cool is that water availability may be restricted during hot summers in South Texas. In addition, temperatures may simply get too hot for fluttering to be effective. According to data compiled by Dr. Fred Guthery, exposure to 113°F for as little as 1 hour can be fatal to bobwhites. Consequently, an important means by which quail avoid excessive temperatures is to seek the shade of woody plants. In particular, they look for areas of shade where temperatures are within their thermal neutral zone. In many cases, the only place within this zone during the middle of the day is in the shade provided by plants such as mesquite, spiny hackberry, and Texas persimmon.

The thermal neutral zone of animals is the range of temperatures within which animals do not have to increase their heart rate to increase body temperature when it is cold outside or reduce their body temperature when it is hot outside. For bobwhites, this is about 86–95ºF; for scaled quail, it is about 77–95ºF.

At first blush, it would appear that quail might experience heat stress only on the hottest days since



Locations used by bobwhites had operative temperatures 102°F or slightly higher from about 1:00 pm to almost 5:00 pm, but used locations were much cooler than locations chosen at random.

summertime temperatures exceed 95ºF only during the hottest part of the summer. However, when a weather reporter gives the high for the day, it is the ambient temperature, which is different from the temperature an animal actually feels. Operative temperature is

Editor's Note: Dr. Timothy Fulbright is the Meadows Professor and a research scientist at the Caesar Kleberg Wildlife Research Institute and Regents Professor at Texas A&M University-Kingsville.

the temperature animals feel and includes effects of direct sunlight, heat from the air, and convective cooling from wind. A quail standing in the open, for example, will heat up much more than a quail in the shade. When we talk about quail trying to remain in the thermal neutral zone, we need to think in terms of operative temperature rather than ambient, or air temperature.

Operative temperature can be indexed using instruments called black globes. We have used black globes to estimate the temperature bounds above and below which quail seek cooler or warmer locations. We found that the lower and upper operative temperature selection bounds were 76ºF and 109ºF for bobwhites and 73ºF and 102ºF for scaled quail.

During summer near Cotulla, Texas, operative temperatures at randomly selected locations exceeded 109ºF by 11 am and did not cool below 109ºF until after 5:30 pm. On average, locations used by bobwhites had operative temperatures 102°F or slightly higher from about 1 pm to almost 5 pm. Locations cool enough to be below the temperature at which bobwhites begin to experience hyperthermia appeared to be unavailable during midday, but the birds were able to avoid potentially lethal temperatures.

Maintaining adequate thermal cover should be a priority in quail management. This may become more challenging if the climate continues to warm. Researchers in Oklahoma predicted that continuation of climate warming may cause temperatures of current bobwhite thermal refuges to approach temperatures that the birds will avoid. Ensuring that quail have plenty of woody vegetation cover in the form of trees and shrubs with overlapping canopies to provide dense shade may become even more critical in the future. ~

© Timothy Fulbright

A quail standing in the open will heat up much more than a quail in the shade where it is not absorbing direct solar radiation.

What Do They Eat?

Cedar waxwings are frugivores, foraging on various fruits and berries including crabapple, cherries, service berries, cedar berries, and mulberries. (https://birdsna.org/Species-Account/bna/species/cedwax/foodhabits#diet)

Squirrel tree frogs are insectivores, "eating termites, beetles, spiders, crickets, and ants." (http://frogs.cc/squirrel-tree-frog-hyla-squirella/)

Consider giving a tax-deductible donation to CKWRI

TEXAS A&M UNIVERSITY KINGSVILLE

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

Editor: Alan Fedynich, Ph.D.

SOUTH TEXAS WILDLIFE is printed on recycled paper