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## SEASON OF BURNING AND LARGE MAMMAL USAGE OF GULF CORDGRASS

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Providing high-quality forage for  
cattle and large wildlife species can  
be challenging on some rangelands

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when vegetation becomes mature and too coarse to be eaten. This is a common problem in gulf cordgrass communities. Gulf cordgrass is a highly productive perennial grass native to the Texas Coastal Prairies. When young, gulf cordgrass can provide high quality forage for cattle. However, as it matures the leaf blades become stiff and spine-like with low nutritional value.

Prescribed fire has been used as an effective way of removing the standing old growth of gulf cordgrass and replacing it with more palatable and nutritious forage. Ranchers have often burned gulf cordgrass in the fall to improve its quality and to

use it as a reserve source of forage for cattle during winter dormancy or drought. The optimal season for burning gulf cordgrass to improve nutritional value for wildlife and domestic animal usage, however, is still unclear.

To determine the best time of year to burn gulf cordgrass, we began applying prescribed fire during winter and summer on the East Foundation's El Sauz Ranch in Willacy County, TX. Each winter (January–February) and summer (July–August) for 2 years we are burning 2 pastures that are at least 500 acres each. We have completed 2 winter and 1 summer burn seasons, and we will conduct our last set of summer burns this year.

We have also been tracking the movements of 30 head of cattle using GPS collars, and we have been conducting vehicle counts of large ungulates—cattle, white-tailed deer, and nilgai. GPS collar data have shown that cattle spend more

### This Issue

Burning Gulf Cordgrass.....	1
By The Numbers.....	2
CKWRI News.....	2
Did You Know?.....	3
Quail Parasite Studies.....	3
What Do They Eat?.....	4
Advisory Board.....	4

## By The Numbers

- 19 length in inches (1.6 ft) of the longest Mexican hook-nosed snake recorded in Texas (Texas Snakes: Identification, Distribution, and Natural History, J.E. Werler and J.R. Dixon, University of Texas Press)
- 41–47 range in days of the gestation period of the black-tailed jackrabbit (The Mammals of Texas - Online Edition, W.B. Davis and D.J. Schmidly, Texas Tech University)

time in the burned areas during the 90 days following the burns than they do before those areas were burned, regardless of burning season. Observations conducted by vehicle are also indicating more use by cattle, white-tailed deer, and nilgai within recently burned areas than in non-burned areas.

To understand better why animals are more attracted to recently burned areas, we collected forage samples on a weekly basis for 90 days following the first summer and winter burns. These forage samples allowed us to analyze and monitor fluctuations in crude protein and fiber levels.

In general, crude protein contributes to increased nutritive value, and higher crude protein values result in higher quality forage. On the other hand, fiber is difficult to digest and contributes to a decline in quality.

Our forage analyses determined that for roughly 90 days following both winter and summer burns crude protein levels within regrowth



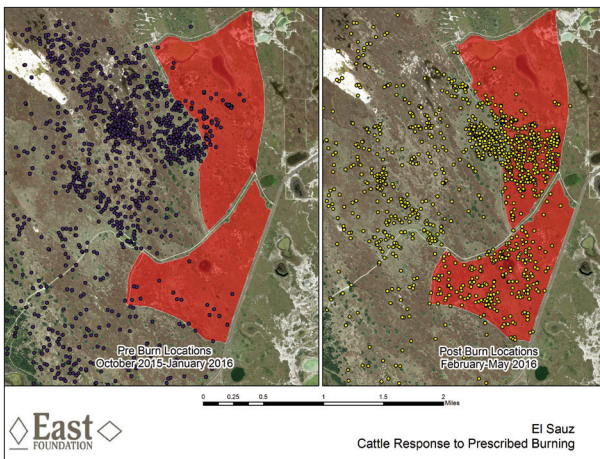
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**A winter prescribed fire burning with high intensity in gulf cordgrass fuels.**

were maintained above 7%. This is an important finding because rumen microbial activity is severely impaired when protein levels fall below 7%. Fiber content was reduced following both burns for 90 days, resulting in higher intake and digestibility. The continued utilization within the burned plots contributes to maintenance of high crude protein and low fiber in the forage as the continual grazing is slowing plant maturation.

Gulf cordgrass has the potential to be a valuable grazing forage if properly managed to maintain an active growth stage. When applied properly, prescribed fire is a tool that can greatly improve the forage value of gulf cordgrass.

As we complete this project, we will be able to give natural resource managers recommendations for optimal burning season and cattle stocking rates to combine in a patch burning and grazing scenario for maintaining gulf cordgrass at its highest quality. ~



The locations of GPS collared cows 4 months prior to our late winter 2016 burn (left image; dark dots) and 4 months following the burn (right image; yellow dots). This figure displays the heightened use of cordgrass rangelands following a late winter burn.

## CKWRI NEWS

### Researcher Honored

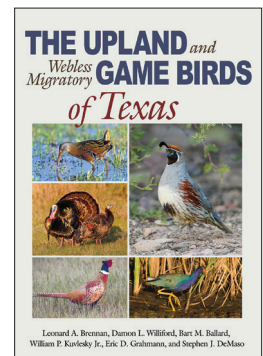
**Dr. Mike Tewes** received the *Honorary Membership Award* from the Texas Society of Mammalogists at this society's 35th annual meeting, which was held February 10–12 at Texas Tech University Center in Junction, TX. The award is given to individuals for their distinguished service within the society. Scientists and students from 14 institutions covering 5 states participated in the annual conference.

### Grad Student Recognized

Master of Science student **Daniel Taylor** received the distinguished *Vernon Bailey Graduate Award* for his poster presentation at the 35th annual meeting of the Texas Society of Mammalogists. His presentation "Evaluation of Non-Invasive Fecal Sampling for Monitoring Bobcats and Ocelots in South Texas" was coauthored by **Drs. Randy DeYoung, Mike Tewes (CKWRI), and Terry Blankenship** (Rob and Bessie Welder Wildlife Foundation).

### New Books Published

The book *The Upland and Webless Migratory Game Birds of Texas*, published in February by Texas A&M University Press, was written by CKWRI researchers **Drs. Lenny Brennan, Damon Williford, Bart Ballard, William Kuvlesky, Jr., Eric Grahmann, and Dr. Steve DeMaso** (USFWS Gulf Coast Joint Venture). The book contains a wealth of up-to-date information on 21 gamebirds within Texas, and includes range maps, habitat and management requirements, and research needs.



*The Upland and Webless Migratory Game Birds of Texas* is available for purchase in hardcover.



Another book, scheduled to be published in September, is *Becoming a Wildlife Professional*, and was edited by **Dr. Scott Henke** (CKWRI) and **Dr. Paul Krausman** (University of Arizona). The book is “...the essential guide for anyone planning a career in wildlife management and conservation.” It will be published by Johns Hopkins University Press and be available in hardcover and e-book.

### Monarch Butterfly Symposium

Several of our scientists participated in the South-Central Monarch Butterfly Symposium, held at the Lady Bird Johnson Wildflower Center, May 31–June 1 (<http://texanbynature.org/symposium/south-central-monarch-symposium/>). At the symposium, **Mr. Forrest Smith** made a presentation titled “Texas Native Seeds and South Texas



© Mike Quinn

**Mr. Forrest Smith** talking about projects being conducted by *Texas Native Seeds and South Texas Natives* at the South-Central Monarch Butterfly Symposium.

Native Projects,” and was part of the session called “Availability and Distribution of Milkweed and Nectaring Resources in the South-Central Region: Milkweed and Nectaring Resources Seed Availability.” In addition, **Dr. April Conkey** participated in the working group discussions. The symposium was hosted by the organization Texan by Nature and **First Lady Laura Bush** made the keynote address. ~

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

## LONG-TERM STUDY OF QUAIL PARASITES IN SOUTH TEXAS

by *Nicole Traub and Alan Fedynich*

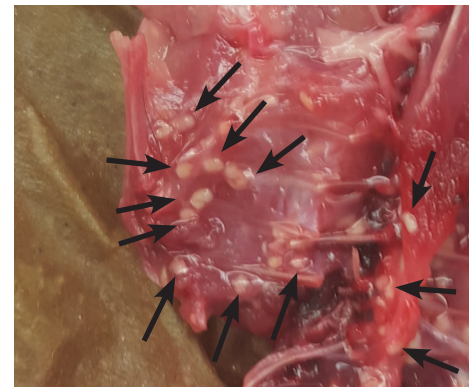
As many know, bobwhites and scaled quail are extensively studied at the CKWRI. To help bridge some gaps in our understanding of parasites infecting these gamebirds, students in Alan Fedynich’s lab have spent the last 4 years gathering information on helminth parasites in South Texas. Two M.S. students who have since graduated, Andrew Olsen and Stephanie Shea, examined hunter-shot quail for internal parasites—studies that updated our knowledge (the most recent previous study was conducted over 3 decades ago). We found 12 helminth species, including the super abundant cecal worm (78–81% of quail infected). The eyeworm also was found, but it seemed to rarely occur (4–9% of the quail were infected), unlike findings from the Rolling Plains where more than 50% of the quail are infected. Both students assessed variation in parasite load by quail age, quail sex, and collection year.

Ph.D. student Nicole Traub will continue adding to the long-term database. She has already found a parasite that has not been reported from South Texas. From this past hunting season, Nicole found a scaled quail from Zapata County infected with a tapeworm in the genus *Mesocestoides*, which

Editor’s Note: Ms. Nicole Traub is a Ph.D. student at Texas A&M University-Kingsville; Dr. Alan Fedynich is a research scientist at the Caesar Kleberg Wildlife Research Institute and professor in the Department of Animal, Rangeland and Wildlife Sciences at Texas A&M University-Kingsville.

has an indirect life cycle using 3 hosts: insect, quail, and carnivore (coyote, ocelot, or another carnivorous mammal). First, an insect eats tapeworm eggs deposited into the environment via an infected carnivore’s feces, then a quail eats the infected insect. While in the quail, the immature tapeworm migrates to the lining surrounding the heart, crop, and body cavity. There it waits for the quail to be eaten by a carnivore so it can develop into an adult, reproduce, and release eggs back into the environment.

Unfortunately, humans can also become infected by ingesting the worm in its larval stage. As of 2016,



© Nicole Traub

A new finding from the South Texas long-term parasite study is the immature tapeworm from the genus *Mesocestoides* within the body cavity of an infected bird. Because the live larval stage of *Mesocestoides* spp. is infective for humans and hunting dogs, caution is warranted if this worm is found in scaled quail or northern bobwhites.

the CDC estimates 30 cases of human infections with adult *Mesocestoides* tapeworms have been documented worldwide, 10 of which occurred in the United States. We urge hunters to use caution when cleaning quail. If the quail has wet-looking white or cream colored oval spots on the

### Did You Know?

The Mexican duck is considered to be a subspecies of the mallard. (<https://www.allaboutbirds.org/guide/Mallard/id>)

The fungus that causes white-nose syndrome in hibernating bats, which often leads to death of the infected bat, has been found in 6 counties in North Texas. (<https://www.whitenosesyndrome.org/partner/texas-parks-wildlife-department>)

flesh or organs (see photo), we suggest the quail be discarded and not eaten by human or animal. Discard the carcass in a place where other carnivores, including your hunting dogs, cannot eat it, and be sure hunters and carcass cleaning personnel thoroughly wash their hands after touching an infected quail.

In addition to the long-term parasite survey data being collected, Nicole's study also will focus on factors that potentially influence the quail-parasite relationship, factors which we know very little about, such as interactions between rainfall, quail density, and parasites. Because rainfall is integral to quail population dynamics, we will be examining the relationship between rainfall, insect abundance, and quail population density spanning a 7-year period (2012–2019), hopefully capturing an entire boom-and-bust cycle.

This year, we are planning to examine the population dynamics of insects that serve as food for quail

**Advisory Board**

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

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**Our research is focusing on how parasite infections are influenced by rainfall, insects, and bobwhite population density.**

as well as intermediate hosts for parasites. We are partnering with

several ranches to collect insects. We want to track insect abundance to (1) determine which insects are available as food for quail, (2) determine which insect species are being used as intermediate hosts, (3) estimate the percentage of the insect population infected by larval stages of parasites, and (4) examine the relationship between insect abundance and rainfall.

Holistic studies like ours are needed to understand interrelationships among host, parasite, and the environment. Thus far, we have learned what helminth parasite species occur in South Texas. Now, we are taking the next essential step to see what environmental factors are influencing the dynamics of the quail-parasite system occurring in South Texas. ~

**Consider giving a tax-deductible donation to CKWRI**

**What Do They Eat?**

The snowy egret feeds on "shrimps, small fish, frogs, snakes, and grasshoppers." (Handbook of Birds of the World, Vol. 1, del Hoyo et al., Lynx Edicions)

The Merriam's kangaroo rat is considered a granivore, dining almost exclusively on seeds from "mesquite, creosote bush, purslane, ocotillo, and grama grass." (The Mammals of Texas - Online Edition, W.B. Davis and D.J. Schmidly, Texas Tech University.)



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