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CKWRI Quail eNews

News from the Richard M. Kleberg, Jr. Center for Quail Research at the Caesar Kleberg Wildlife Research Institute

Richard M. Kleberg, Jr. Center for Quail Research

Caesar Kleberg Wildlife Research Institute

CKWRI Quail eNews - May/June 2012

In this issue of the eNews, graduate student Eric Grahmann and Dr. Timothy Fulbright discuss their research on the exotic grass rangelands of south Texas and lessons in managing the habitat for northern bobwhite.

Special note: In March of this year, the South Texas Chapter of the Quail Coalition graciously donated \$70,000 to the Caesar Kleberg Wildlife Research Institute for research and student scholarships. Recipients of the South Texas Chapter of the Quail Coalition Scholarship in Wildlife Management for 2012 are Brian Bielfelt, Brandi Crider, Stephen Goertz, Kristan Jenschke, Katherine Miller, Chad Parent, Whitney Priesmeyer, Ian Trewella, and Dean Wiemers. Remaining scholarship money was used to support graduate students Jennifer Korn, Eric Grahmann, Justin Folks and Kory Gann. Congratulations to the recipients!

Over the last decade the South Texas Chapter of the Quail Coalition has donated more than \$400,000 to our institute. We are very grateful for their continued support to our research, and we look forward to many more years of cooperation between our organizations to benefit quail management in south Texas.

MANAGING EXOTIC GRASS DOMINATED RANGELANDS FOR NORTHERN BOBWHITES

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***Providing the science
behind quail
conservation and
management.***

May/June 2012

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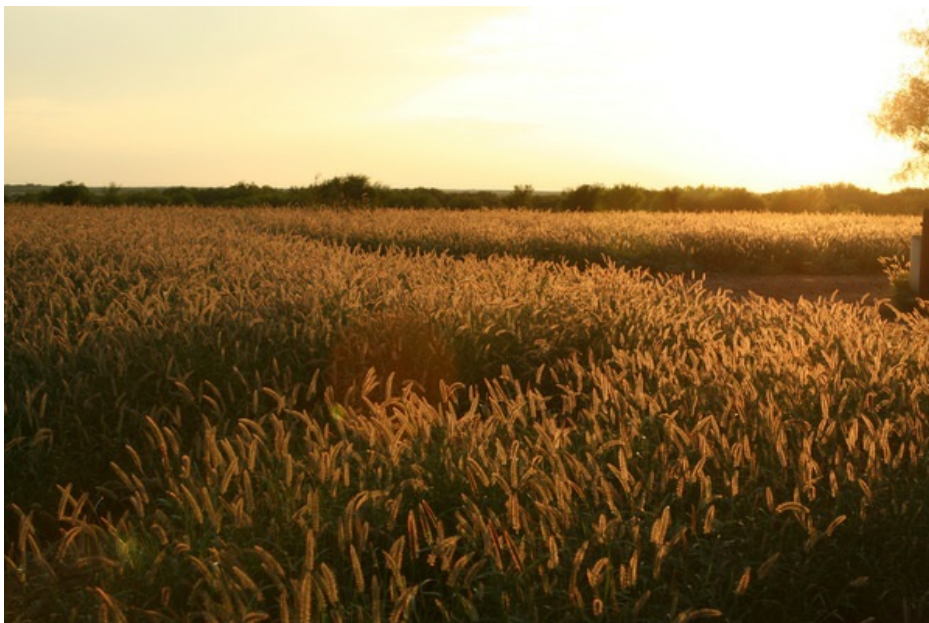
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Quail managers and hunters have long noted the population decline of northern bobwhites across their range. South Texas has mostly been an exception to this rule as bobwhites and hunting opportunities have remained abundant because of large tracts of relatively contiguous native habitat in the region. However, over the past 50 years or so, more than 10 million acres have been converted to exotic grass pasture through planting, soil disturbance, and prescribed fire, among other factors. Exotic grasses introduced to south Texas include, buffelgrass, old world bluestems (Kleberg and King Ranch bluestems), Guineagrass, Bermudagrass, Lehman's lovegrass, Kleingrass, Wilman's lovegrass, and blue panicgrass, just to name a few. Most exotic grass species were introduced to prevent erosion and supply cattle with forage, but they have spread beyond where they were planted and continue to spread across the landscape.



Exotic buffelgrass dominates the landscape (Grahmann 2012).

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CKWRI Quail eNews:

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Native vegetation provides excellent habitat for northern bobwhite (Grahmann 2012).

Exotic grass dominated rangeland generally equates to poor wildlife habitat in south Texas. Northern bobwhites nest in exotic grasses such as buffelgrass, Kleberg bluestem, Guineagrass, and Kleingrass, but the positives gained from increased nesting resources may be outweighed with the subsequent loss in usable space. Former CKWRI student, Dr. Joseph Sands noted that bobwhite abundance was roughly cut in half in areas dominated by buffelgrass, and forb abundance decreased with increased exotic grass canopy cover. Forbs, or broadleaf herbaceous plants, form the backbone of quail food sources. Bobwhites depend on seeds produced by forbs, and quail chicks must have access to insects for the first few weeks after hatching. Insect species richness and abundance increases with increasing numbers of native forb species and forb abundance. Exotic grasses also reduce the overall heterogeneity or patchiness of the landscape. Quality bobwhite habitat is renowned for having high patch diversity with suitable areas of bareground, woody, grassland, and forb cover interspersed across the landscape. Along with degradation of heterogeneous native plant communities (bobwhite habitat), researcher Aaron Tjelmeland found that bobwhite use of buffelgrass dominated rangeland was restricted to the peripheries adjoining native brushlands. Bobwhite use of interior exotic grassland was restricted to edges created by the introduction of caliche roads and oil pads.



Heterogenous habitat created by patch-burning (Grahmann 2012).

Before we began our project, researchers had not tackled the problem of learning how to manage exotic grass stands for bobwhites. Using information gained from Dr. Sands and Aaron Tjelmeland's research, in our ideas for managing grasslands for diversity, we started an exotic grass management project on the Hixon Ranch in LaSalle County using the technique of patch-burning and grazing. The patch-burning and grazing concept was made popular by Oklahoma State University rangeland ecologist Dr. Sam Fuhlendorf. In his research, Dr. Fuhlendorf found that using relatively small burns across the landscape in Oklahoma tall grass prairie, coupled with cattle grazing, increased landscape scale heterogeneity, increased plant species richness, and increased grassland bird species richness and abundance.



Cattle grazing on a patch-burn site on the Hixon Ranch (Grahmann 2012).

Similar to many ranches in south Texas, portions of the Hixon ranch had been converted to exotic grass dominated rangeland during the past 40 years. We applied patch-burning and grazing on exotic grass monocultures on our study site. Since 2009, we burned approximately 25% of the exotic grasslands in small, irregularly shaped burns (0.2 – 8 acres in size) during January. When grass reached approximately 6 inches in height on burned patches, we stocked pastures with 500 – 600 pound steers until half of the unburned exotic grass had been consumed.



Eric Grahmann monitors a burn on the Hixon Ranch (2012).



Patch-burns on the Hixon Ranch observed from above (Grahmann 2012).

In 2010, patch-burning and grazing exotic grass monocultures resulted in a

patchwork of relatively lightly grazed (43% utilization), moderately grazed, and heavily grazed (91% utilization) patches across the landscape and increased forbs in some burned areas. During the study, bobwhites used exotic grasslands during the nesting season after significant rainfall events (>1 inch). Most exotic grass use by bobwhites was restricted to areas with woody plant cover. As in Aaron Tjelmeland's study, bobwhites remained partial to the edges of native plant communities. At this point, it is unclear whether patch-burning and grazing increased habitat quality or bobwhite population density. At any rate, it is clear that the preservation of native plant communities remains the most important practice managers can do to ensure bobwhite population persistence.



A bobwhite hen incubates her nest on the Hixon Ranch (Grahmann 2012)

Regardless of the outcome of our research, there are several lessons we have learned for maximizing wildlife habitat in exotic grass dominated rangeland, especially for quail:

- Preservation of remnant native plant communities should be the highest priority to wildlife managers in south Texas. Ecologically harmful practices such as root-plowing and other mechanical brush treatment practices should be avoided in historically untreated areas. Mechanical brush treatment may decrease perennial plant species richness and facilitate the invasion of bufflegass and other exotic grasses.
- Land managers should incorporate cattle grazing into their management strategy if exotic grasses are prominent. Dense stands of exotic grass greatly simplify plant diversity and may inhibit bobwhite travel. Cattle inventory has been steadily decreasing while exotic plant abundance has been increasing in south Texas. A hypothesis that we have not tested yet is that grazing during the growing season while stocking conservatively during winter and spring may give native plants a competitive advantage.



- Proceed with caution when considering disturbance based management of bobwhite habitat in predominately native plant communities. For example, although important food plants can be stimulated and increased in many soil types with practices such as disking, soil disturbance exacerbates invasion of exotic grasses in soils where they are adapted (almost every soil series in south Texas). Conversely, disking in exotic grass dominated communities may greatly enhance plant diversity in the short-term (<1 year).





Disking can provide greater diversity in the short term, however exotic grasses thrive on this soil disturbance when applied repeatedly (Grahmann 2012).

In addition to soil disturbance, prescribed fire increases exotic grasses especially when exotic grasses are not grazed. On some ranches in south Texas, the use of sparse native plant communities as “fire guards” to stop exotic grass fueled fires has resulted in increased exotic grass coverage and reduced native plant dominated communities. We recommend avoiding the use of fire as a management tool in areas where exotic grasses are present, but not dominant, for landowners who wish to maintain huntable quail populations. Fire likely increases exotic grass dominance in south Texas where seed sources are present (almost all soils). However, where exotic grasses dominate (>90% cover), fire can be used to manage stands for plant and structural diversity.



Refrain from burning grasslands dominated by ungrazed exotic grasses. These grasses will thrive on fire disturbance (Grahmann 2012).

Exotic grass invasion is projected to continue well into the future. If we are concerned about keeping quail abundant throughout the south Texas landscape,

we must take this invasion seriously and refine our management techniques. If you have any additional questions regarding exotic grass management or would like to make a donation to exotic grass research, please contact Eric Grahmann at (361)522-9868, eric.grahmann@students.tamuk.edu, Dr. Timothy Fulbright at (361) 593-3714, timothy.fulbright@tamuk.edu, or Forrest Smith at (361) 593-4525, forrest.smith@tamuk.edu



Native grassland on the Hixon Ranch (Grahmann 2012).

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The mission of the Richard M. Kleberg, Jr. Center for Quail Research is to develop a scientific basis for the sustainable management and harvest of wild quail populations throughout South Texas and elsewhere.



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