Caesar Kleberg Wildlife Research Institute's Invasive Grass Research Approach

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Invasive grasses in south Texas

Our primary concern: wildlife habitat quality and wildlife productivity



Invasive grasses in south Texas

Goals

- Are invasive plants positive, negative, or indifferent for wildlife?
- Develop management practices to deal with invasive plants that negatively impact wildlife



Areas of concentration in invasive grass research at CKWRI

Effects on wildlife, native plants, and biodiversity



Native plants to replace invasive grasses Management practices to deal with invasive plants

What we have done so far





Completed theses and dissertations: 11 since 2003



Current research: 11 ongoing projects; 10 graduate students



Published papers

- 4 peer reviewed journal articles
 - Impacts on breeding birds (Auk)
 - Restoring natives in buffelgrass-dominated sites (Restoration Ecology)
 - Disturbance and buffelgrass increase (J. Arid Environments)
 - Buffelgrass and forbs (Invasive Plant Science and Management)
- 2 conference proceedings
 - Impact of invasive grasses on quail (Quail V: The 5th National Quail Symposium)
 - Fire and guineagrass (Tall Timbers Fire Ecology Conference Proceedings)

Selected Findings to Date



Effects on wildlife, native plants, and biodiversity

Non-native grass sites vs. native grasses

 Northern bobwhite densities 50% less
 Arthropod abundance 60% less
 Songbirds less abundant

 Bobwhites

 nest in buffelgrass clumps
 avoid foraging in gross with > 20% buffelgrass

 avoid foraging in areas with >30% buffelgrass canopy cover

Effects on wildlife, native plants, and biodiversity

- Plots with 0-5% buffelgrass canopy cover, vs. >25% buffelgrass
 - -73% less native forb canopy cover
 - 64% less forb species richness
 - -77% less native forb density



Effects on wildlife, native plants, and biodiversity

Guineagrass seeds are palatable to bobwhites Seeds too small to be of benefit nutritionally Bobwhites avoid areas dominated by guineagrass for resting and feeding



Management practices to deal with invasive plants

Patch burning and grazing
 – reduces guineagrass
 – increases native forbs





Restoration techniques

 Tebuthiuron application

 temporarily reduces buffelgrass
 Chloris spp. increases

 Reducing soil N did not reduce guineagrass



Native plants to replace invasive grasses

 Windmillgrasses provide similar canopy cover to bermudagrass in roadside plantings
 South Texas Natives/ USDA-NRCS Kika de la Garza Plant Materials Center releases

- -7 grasses
- -4 forbs



Ecology and physiology

- Shoot tissues of buffelgrass decompose twice as fast as tanglehead
- Buffelgrass shoots have 63% lower C:N ratio than tanglehead
- Soil adaptation of tanglehead vs. buffelgrass
 - averaged across soils from Texas to Arizona
 - slightly lower pH
 - 13% more sand

Summary

Invasive grasses threaten wildlife productivity and diversity in south Texas

- CKWRI has a broad-based research program
 - Impacts of invasive grasses
 - Management of invasive grasses
- Formation of partnerships to help find solutions
 - soil microbiology
 - plant physiology

Funding

- Betty Kelso
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- Exxon
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- Hixon Ranch
- Houston Livestock Show and Rodeo
- Houston Safari Club
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- South Texas Natives
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- Texas Department of Transportation
- Texas Parks and Wildlife Department
- USDA, Natural Resources Conservation Service