

Fire and Cattle Grazing to Manage Exotic Grass Stands

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Introduction

- Exotic grasses dominate millions of acres in southern Texas
- Buffelgrass (*Pennisetum ciliare*)
Kleberg Bluestem (*Dichanthium annulatum*)
Guineagrass (*Urochloa maxima*)



Introduction

- Overgrazing has been largely responsible for vegetation community simplification in southern Texas
- Most exotic grasses were introduced to increase biomass production for cattle
- Cattle continue to influence the spread of exotic grasses

Introduction

- Most exotic grasses respond well to fire, especially warm-season burning
- In many cases Kleberg bluestem and buffelgrass are invigorated more than natives following fire especially if soil moisture is limited



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Photos by: Michael Hehman

Introduction

- Protection from excessive grazing reduces the rate of spread by exotic grasses into predominately native areas
- Most exotic grasses are more adapted to disturbances than natives
- Exotic grasses have the ability to spread with or without disturbances such as grazing and fire

(Bock et al. 2007. Spread of non-native grasses into grazed versus ungrazed desert grasslands. Journal of Arid Environments. 71:229-235.)



Southern Texas

- Cattle have been removed from many properties in southern Texas because of a land use shift targeting wildlife
- Cattle inventory has decreased about 5% in the last 10 years



Photo by: Poncho Ortega

The Result

- Areas planted with or invaded by exotic grasses are no longer kept in check
- Most areas dominated by exotic grasses have become floral monocultures
- Exotic grasses produce so much biomass that it suppresses native herbaceous vegetation and results in a loss of plant biodiversity
- Southern Texas is considered “hyperdiverse” ... for now



Photo by: Michael Hehman



Photo by: Poncho Ortega







What should we do?

- It is unlikely that exotic grasses will be eradicated from southern Texas
- The Caesar Kleberg Wildlife Research Institute is focusing on the management and control rather than the elimination of exotic grass stands
- i.e. integrating fire and grazing in combination to manage exotic grasses

Burning and Grazing

- The same factors that have led to our exotic grass problem can be used to remediate it
- Cattle grazing led to homogeneity within a prairie dominated by tallgrasses in Oklahoma
- Moving cattle with the use of small burns concentrated cattle resulting in a heterogeneous plant community

(Fuhlendorf et al. 2006. Should heterogeneity be the basis for conservation? Grassland bird response to fire and grazing. Ecological Applications. 16:1706-1716.)

Burning and Grazing

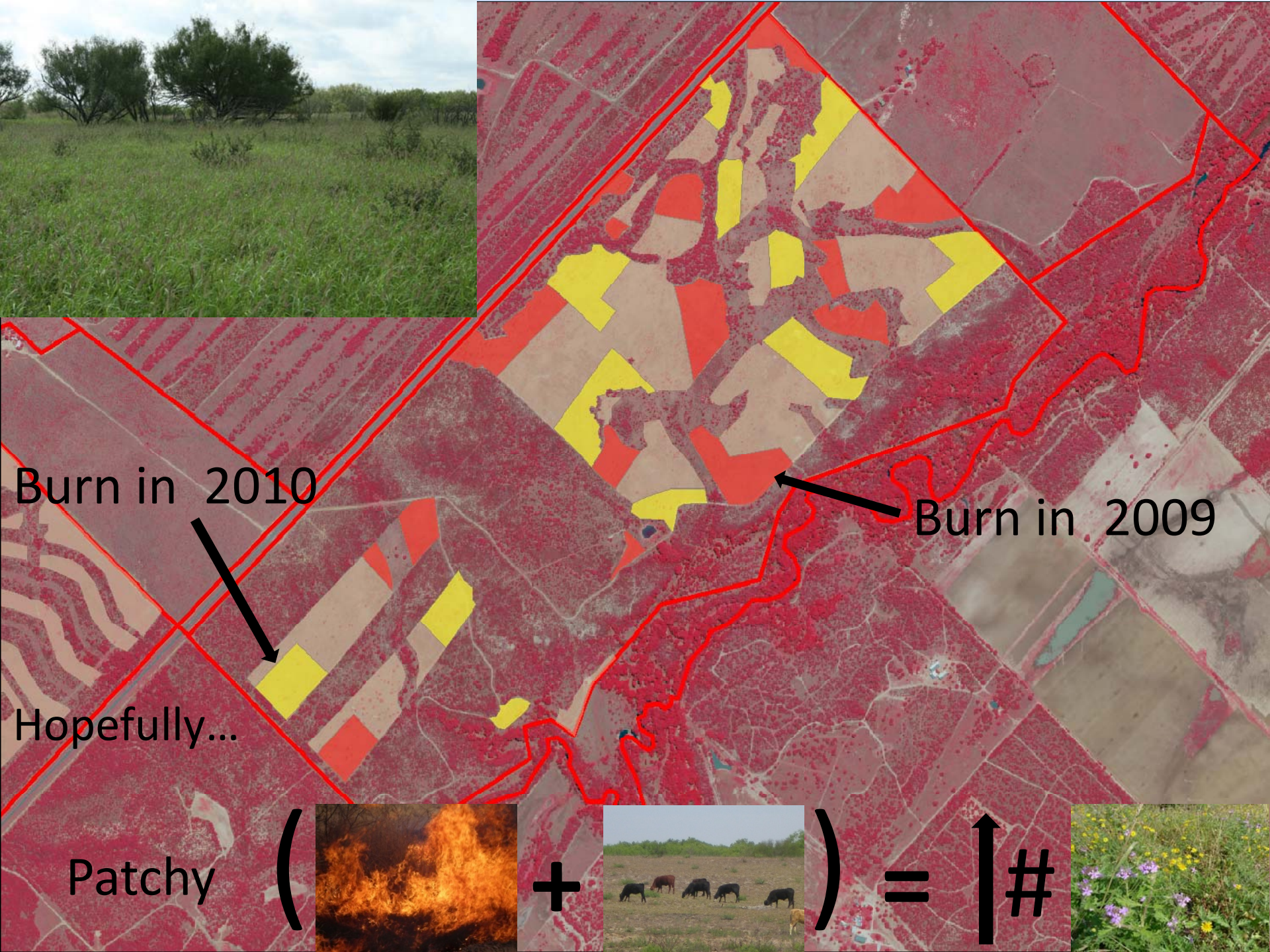
- Burning grass generally increases their palatability
- Cattle overgraze grasses and reducing their health and competitiveness while promoting the growth of other species



Burning and Grazing

- Guineagrass density decreased following summer burning and native plant density increased
- Native plant species increased from 1 to 4.3 species/0.25m², an increase of 330%
- 16 species were newly recorded post treatment

(Ramirez-Yanez et al. 2007. Use of prescribed fire and cattle grazing to control guineagrass. Proceedings of the 23rd Tall Timbers fire ecology conference.)



Burn in 2010



Burn in 2009



Hopefully...

Patchy

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Buffelgrass

0 other herbaceous species



8 other herbaceous species

Conclusion

- Exotic grasses were planted to supply cattle with an abundance of biomass
- Cattle have been removed from many properties in southern Texas
- The reduction of grazing pressure and use of prescribed fire generally benefits native plant community diversity in southern Texas

Conclusion

- But, in areas where exotic grass species are dominant, disturbances such as fire in combination with concentrated grazing are needed to maintain plant biodiversity
- Problem: It is challenging to keep proper stocking rates in combination with the right timing
- i.e. not enough water, supply of stockers not large enough

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Questions or Comments?