

Slender Rush-pea (*Hoffmannseggia tenella*): Conservation through Management— A Case Study



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Slender rush-pea

- Herbaceous perennial legume with a woody taproot (Fabaceae)
- Leaves are alternate
- Bipinnately compound with 5 to 7 leaflets
- Stem is often reddish
- Flowers are yellow-pink to orangish-red



Background

- Remnant short-grass prairie sites
 - blackland clays
 - coarser texture and lighter colored than a clay
- Often found with South Texas ambrosia (*Ambrosia cheiranthifolia*)
- Endemic to Kleberg and Nueces counties

Current status

- Endangered (1985)—
without critical habitat
- Destruction of native
Gulf-coastal prairies
 - Agricultural expansion
 - Invasive grasses
 - Kleberg bluestem
(*Dicanthium annulatum*)
 - Bermudagrass (*Cynodon
dactylon*)

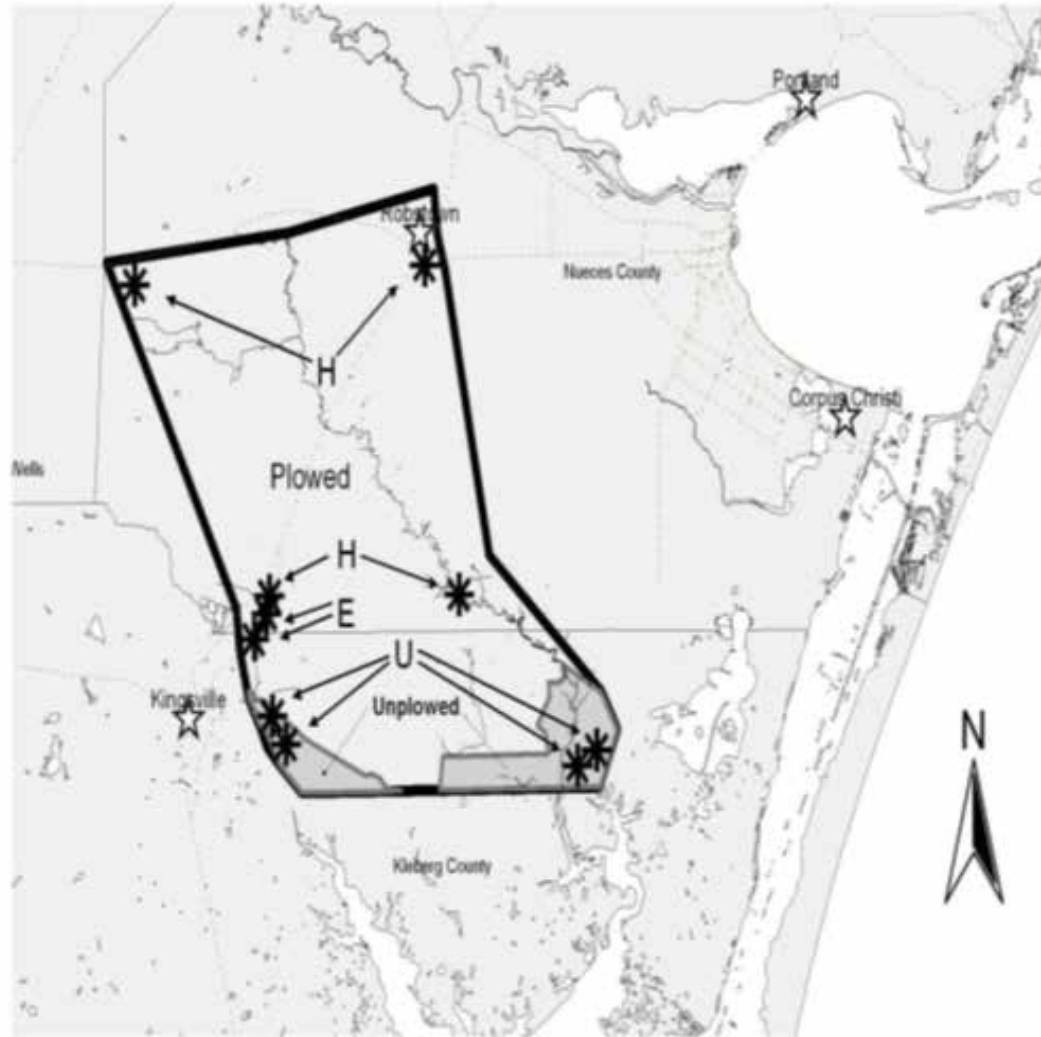


Known populations

Major Land Use/Land Cover
Within Slender Rush Pea's
Range in Nueces and Kleberg
Counties, Texas



- Known Populations
- Cities / Towns
- Drainage Areas
- Major Roads
- Unplowed Areas
- Range
- Counties



Status: H = Historical E = Extant U = Unknown

Recovery Plan (1988)

- U.S. Fish and Wildlife Service
- “to develop and implement habitat management practices that will enhance the populations”
- No peer-reviewed literature on experimental studies



Study Area

- St. James Cemetery
- Bishop, TX (southern Nueces County)
- 8 ha (20 ac)
- Victoria Clay, 1 to 3 % slope
- Adjacent to Carreta Creek
- Jackie Poole (1985)
- Largest population known to exist
- Invaded by Kleberg bluestem and bufflegrass (*Cenchrus ciliaris*)



U.S. Fish & Wildlife Service.

Objectives

- Quantifying competitive effects between slender rush-pea and invasive grasses
- Assess the effects of prescribed burning on slender rush-pea individuals
 - Rx fire has low cost and mimics natural occurrence
 - Effects on slender rush-pea have not been studied at all
- Ecological neighborhood assessment

Methodology

- Treatments
 1. weed-eat neighboring plants
 2. herbicide neighboring plants
 - Neighboring plants within a 1-m diameter circle received a treatment
 3. prescribed burning
 - Small plots (roughly 10 m² minimum) including slender rush-pea plants
 - Wright and Bailey. 1982. Fire Ecology of United States and Southern Canada, p. 20



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 4. control (no manipulation)
- These treatments have been maintained since July 2012 and are repeated as necessary with precipitation

CONTROL



HERBICIDE



WEED EATER



BURN



Response Variables

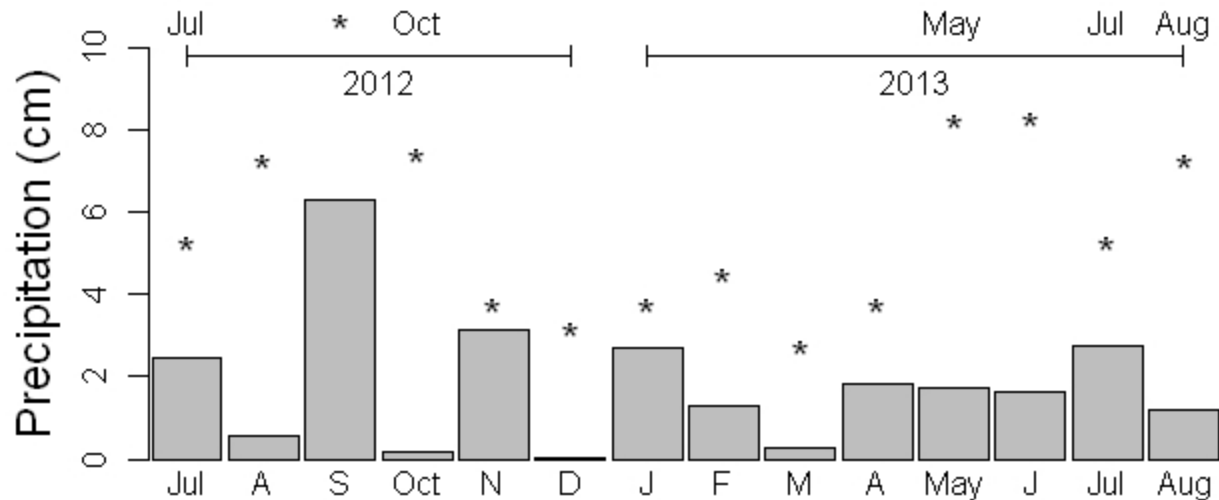
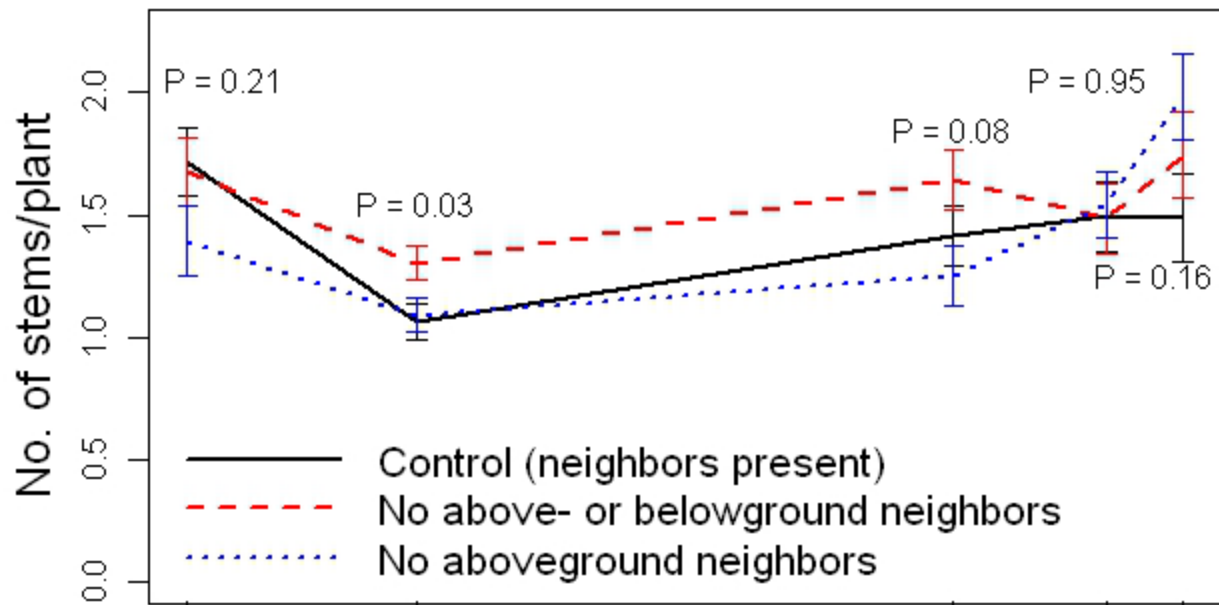
- Number of main stems
- Length of longest stem (mm)
- Number of leaves on longest stem
- Total number of flowers showing color on plant
- Total number of seed pods on plant
- Survival



Statistical Analysis

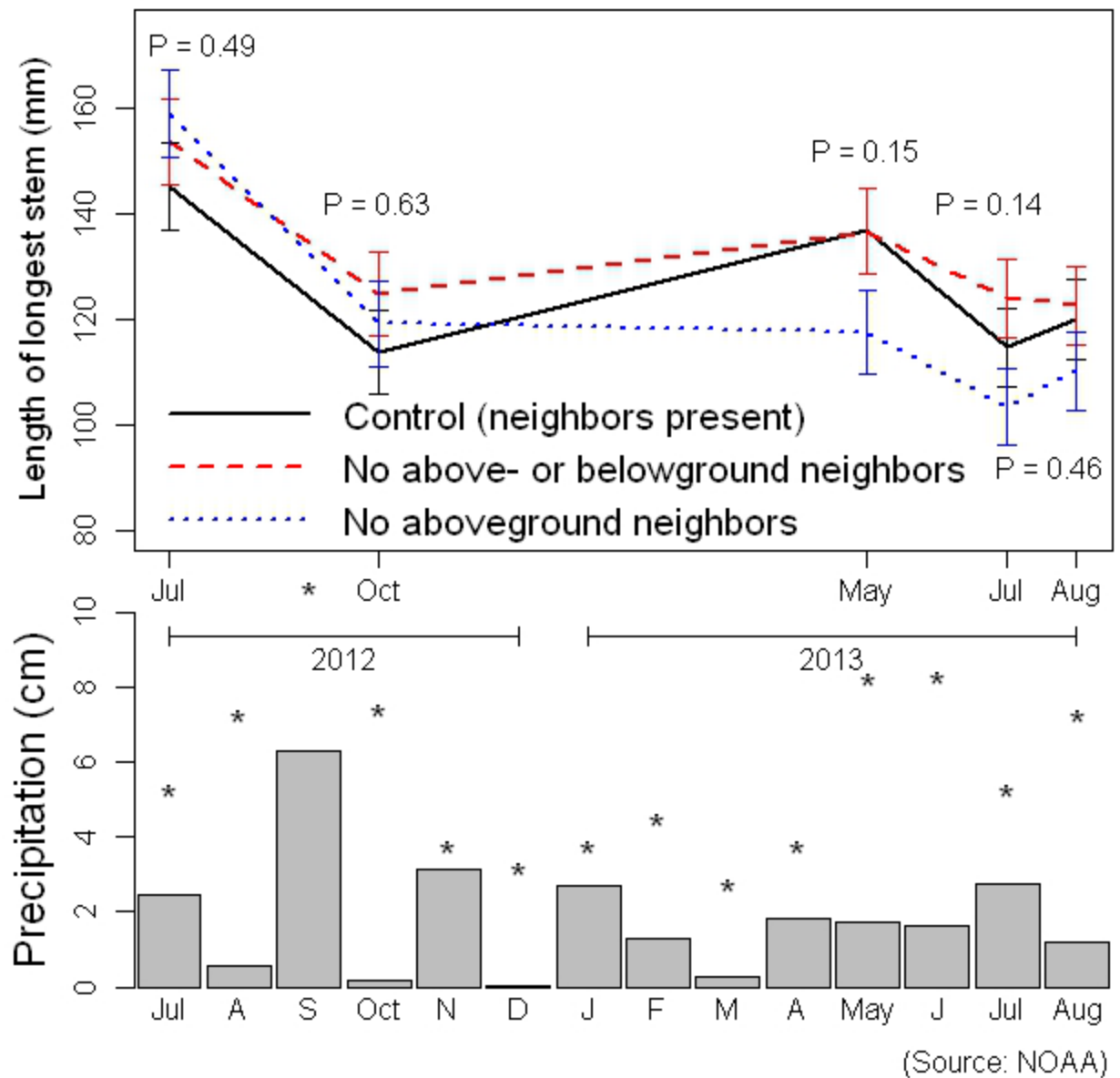
- Count variables analyzed as a negative binomial distribution with a generalized linear mixed model for repeated measures
- Survival analyzed as a binomial distribution with a generalized linear mixed model for repeated measures
- Continuous variables analyzed with a general linear mixed model for repeated measures

Number of Main Stems

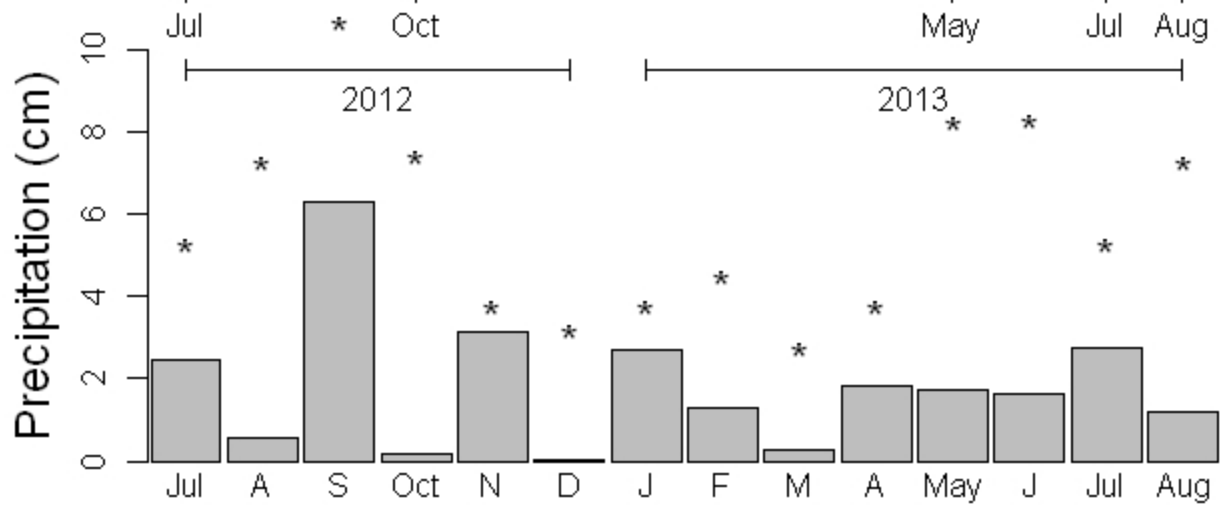
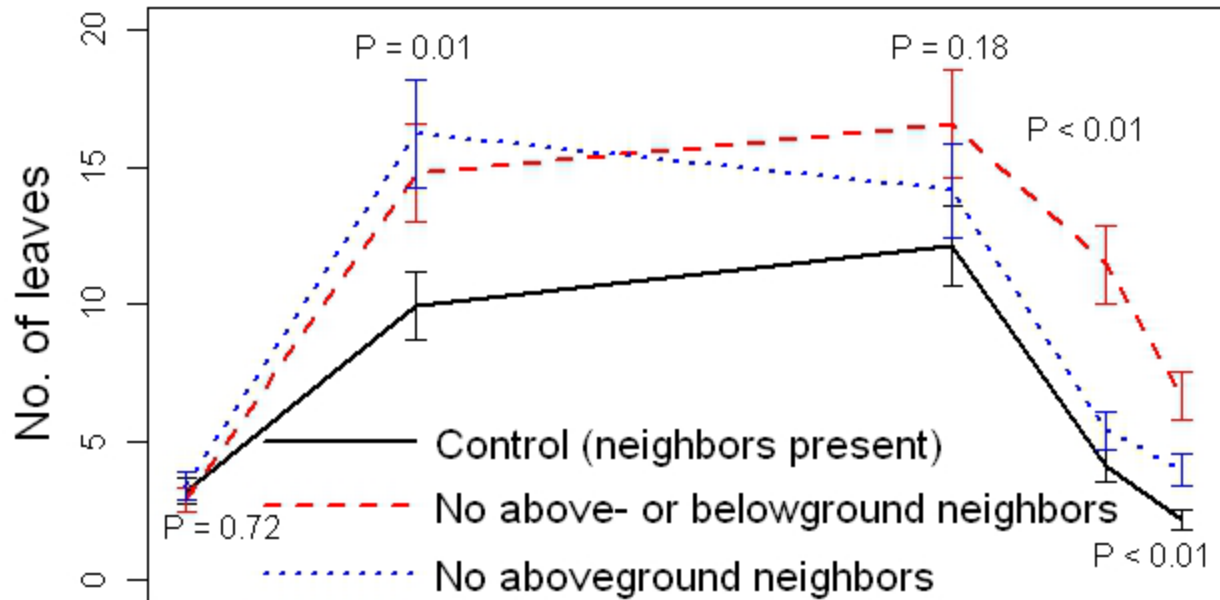


(Source: NOAA)

Length of Longest Stem (mm)

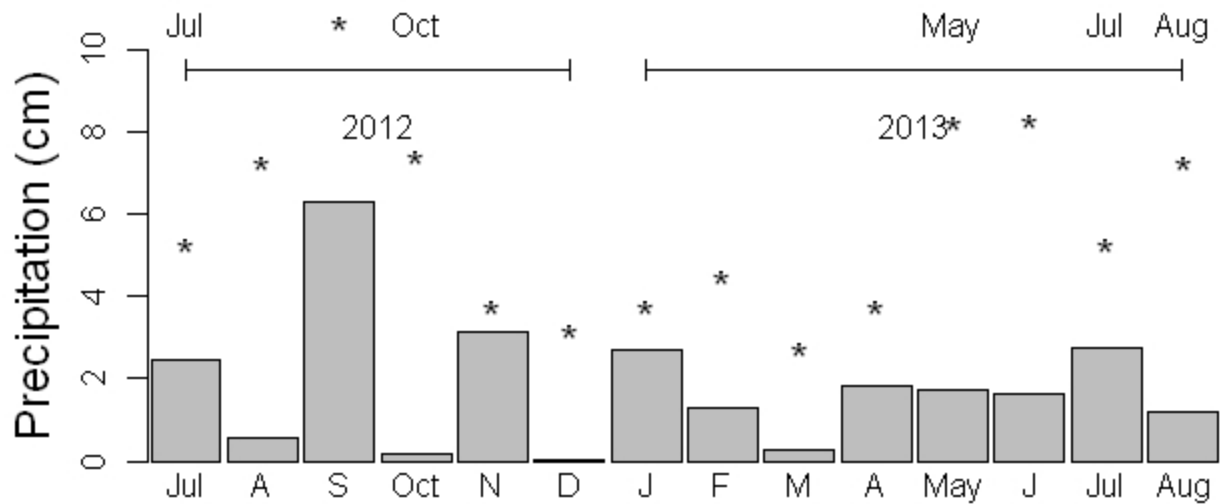
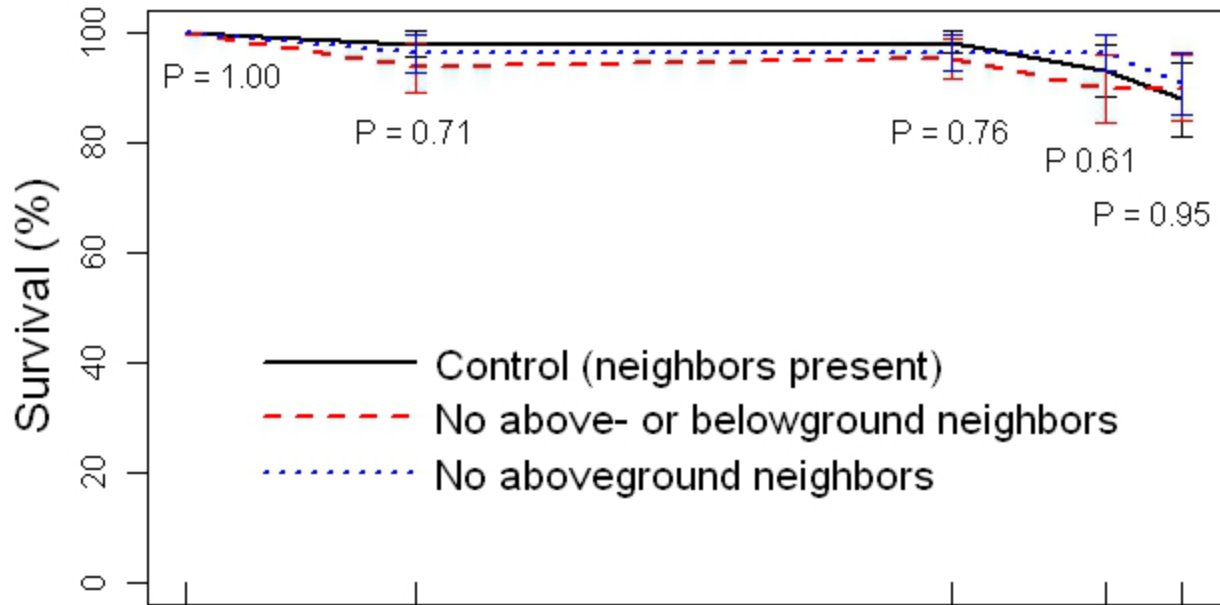


Number of Leaves on Longest Stem



(Source: NOAA)

Survival (%)

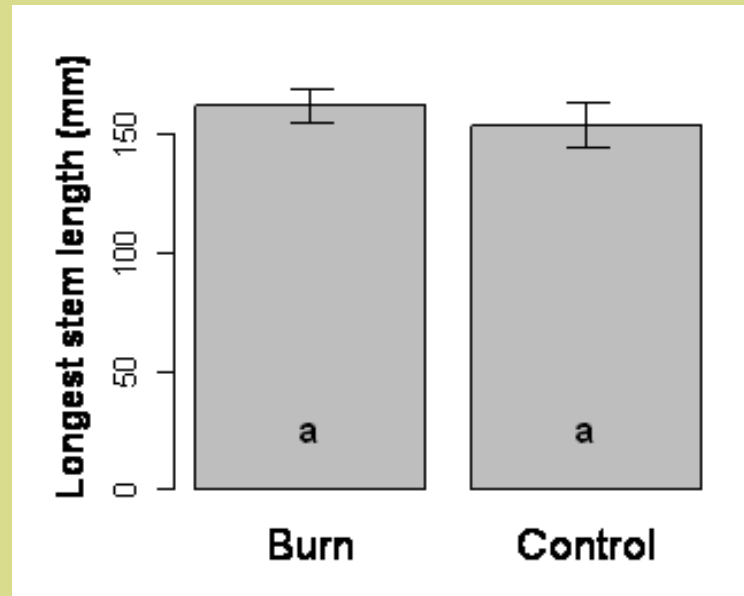
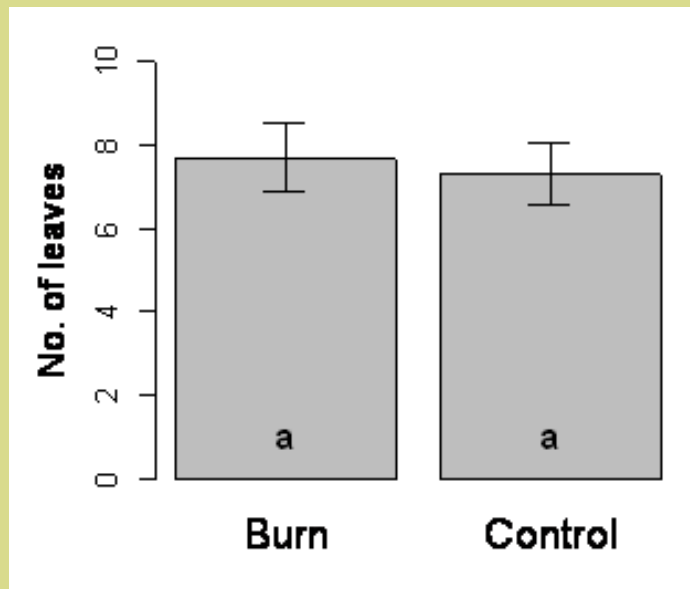
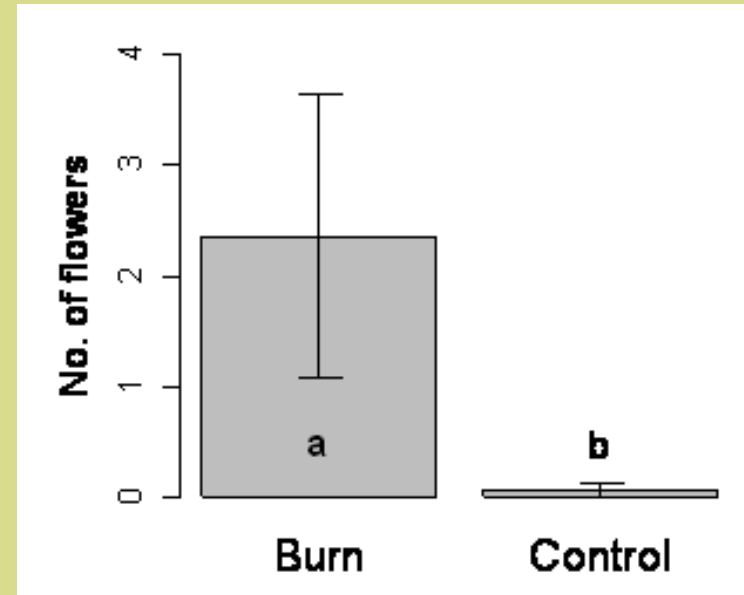
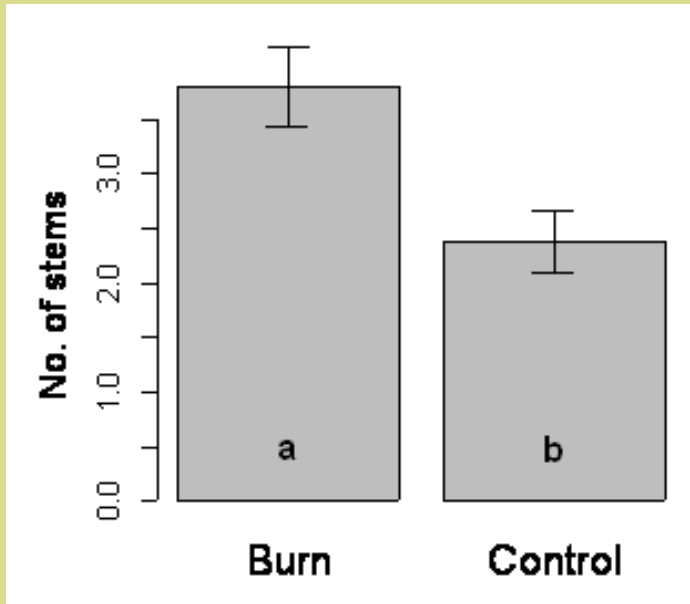


(Source: NOAA)

Fire Effects

Ø Burning took place Aug. 6, 2013

Ø Data for post-fire comparisons were collected in Sep. 23.



Preliminary Conclusions



Morphometric Responses

- Ability to adapt to enhanced resource availability by:
 - growing more leaves
 - growing more stems
- Treatments could result in different responses under different environmental conditions

Management Implications

- Removal or reduction of competition seems to serve as an effective management strategy
- Results are preliminary



Management Implications

Our goal is to create effective management recommendations for survival and encouragement of slender rush-pea populations



References

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Thank You

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Questions?

