Investigating the effects of small mammals and plant competition on native and exotic species within annual grassland communities.

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Exotic Species

- High germination
- High establishment
- High seed production







Invasion process

• Exotics establish

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- Outcompete natives



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Fast growth rate = increased competition for natives



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Understanding invasion: Plant functional traits



Understanding invasion: Consumer – plant interactions



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Impacts of consumers and plant competition



Research questions



- 1. Do plant competition &/or small mammals influence grassland community composition?
- 2. Do effects differ between exotic and native species?
- 3. Do plant functional traits mediate the effects?

Specific questions

Does competition & small mammals impact:

1) Probability of recruitment?



Specific questions

Does competition & small mammals impact:

1) Probability of recruitment?

2) Density of established stems?



Specific questions

Small mammal treatment

Competition treatment

Seed provenance: natives vs. exotics

Exotics seed mix Native seed mix

Functional traits

- Seed mass germination
- **Specific leaf area** resource acquisition
- **Leaf water content** resource acquisition
- Maximum height competition
- **Leaf Nitrogen** herbivory preference

Probability of recruitment

- Exotic species higher recruitment
- Native species lower recruitment in presence of competition
- No effect of small mammals

Probability of recruitment

Larger seeded species -higher recruitment

Establishment density

- Exotic species higher establishment densities
- Natives higher densities in absences of competition
- Small mammals increased density of native species in the presence of competition

Reproduction

- Exotic species higher number of stems that reproduced
- Competition decreased reproduction of native species
- No effect of small mammals

- Small mammals = no overall preference
- Exotic species are dominant

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- Competition dictating native species success
- Seed mass influenced establishment
- Small mammals benefit native establishment under competition

Management implications

- Targeted management of exotic species
- Remove or heavily thin vegetation
- Plant larger seeded native species to improve recruitment

Future questions

- Composition of the resident vegetation
- Seed size preference of mammals
- Competition and small mammals effect on functional diversity

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Recruitment in control plots

Reproduction in control plots

Recruited and reproduced

SpeciesCode