LARGE SCALE RESTORATION OF NORTHERN BOBWHITE HABITAT ON A RANGELAND DOMINATED BY NON-NATIVE GRASSES

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The Problem

• Non-native invasive grasses
  • Buffelgrass (*Pennisetum ciliare*)
  • Old World bluestems (*Dicanthium annulatum, Bothriochloa ischaemum var. songarica*)
• Competition with native plants
• Adverse effects on native wildlife
Restoration Area

- La Salle County, Texas
- ~270 acres in size
- Long term disturbance
- Unknown if buffelgrass was sown
Pilot Studies

- Pilot studies were done from 2008-2013
- Conducted experiments using many different combinations of herbicide, disking, burning, mowing, and planting native seeds.
Restoration Techniques

- Prescribed burn
  - To remove standing crop
- Remove unwanted brush
  - Some mesquite motts were left for thermal and predator cover
- Repeatedly disk
  - Every major rain event with non-native grass growth
  - Until seed bank is depleted of non-native grass seeds
Restoration Techniques

• Seed restoration area
  • Use native seeds that are ecotypic to the planting site
  • Use a wide variety of species to protect against future non-native invasions as well as changes in climate

• Plant woody plants/cacti
  • Provides cover for wildlife species, specifically for thermal and predator cover for bobwhites
My Role

• Document the following
  • Vegetation community
  • Soil nutrient characteristics
  • Soil seed bank characteristics
• All sampling is done in restoration area as well as a control site
Methods

• Above ground sampling methods
  • Daubenmire frames
  • Line intersect
• Soil sampling methods
  • Use same transects as Daubenmire
  • Seed bank sampled in two layers
• Seedling emergence
Results

Above Ground Composition

<table>
<thead>
<tr>
<th>Composition (%)</th>
<th>Buffelgrass</th>
<th>Old World Blestem</th>
<th>Lambs Quarter</th>
<th>Plains Bristle</th>
<th>Sand Dropseed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>60</td>
<td>20</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
Results

Below Ground Composition

Composition (%)

<table>
<thead>
<tr>
<th>Plant Type</th>
<th>Composition (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual Lazy Daisy</td>
<td>18</td>
</tr>
<tr>
<td>Jamaican Nama</td>
<td>16</td>
</tr>
<tr>
<td>Pimpernel</td>
<td>14</td>
</tr>
<tr>
<td>Buffelgrass</td>
<td>8</td>
</tr>
<tr>
<td>Texas Vervain</td>
<td>4</td>
</tr>
</tbody>
</table>
Results
Results
Conclusions

- Above ground invasive dominance
- Suppressing native growth?
- Long term vegetative monitoring
Acknowledgements

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Questions?