BOSQUE ECOLOGY AND WILDFIRE

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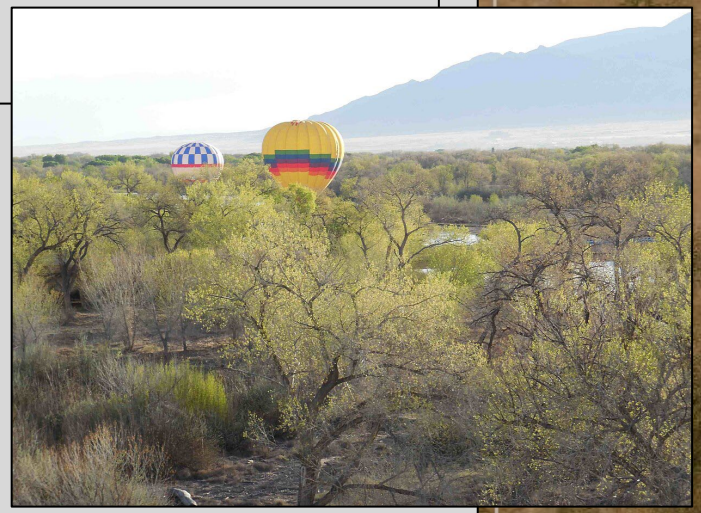
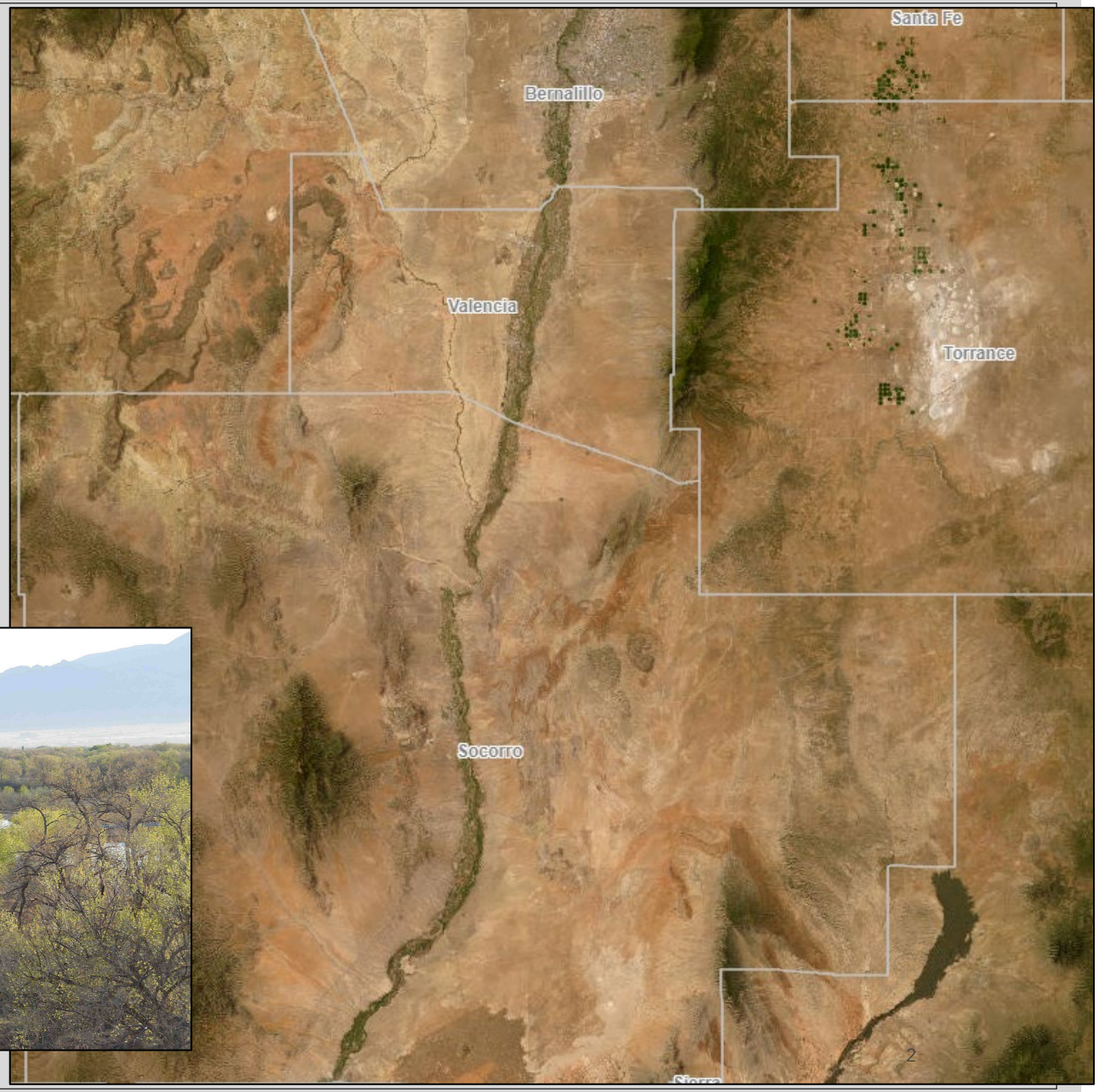
Welcome to the Bosque

- Bosque = unique riparian habitat
- Riverside ecosystem along Middle Rio Grande
- Reliant on available groundwater and flooding



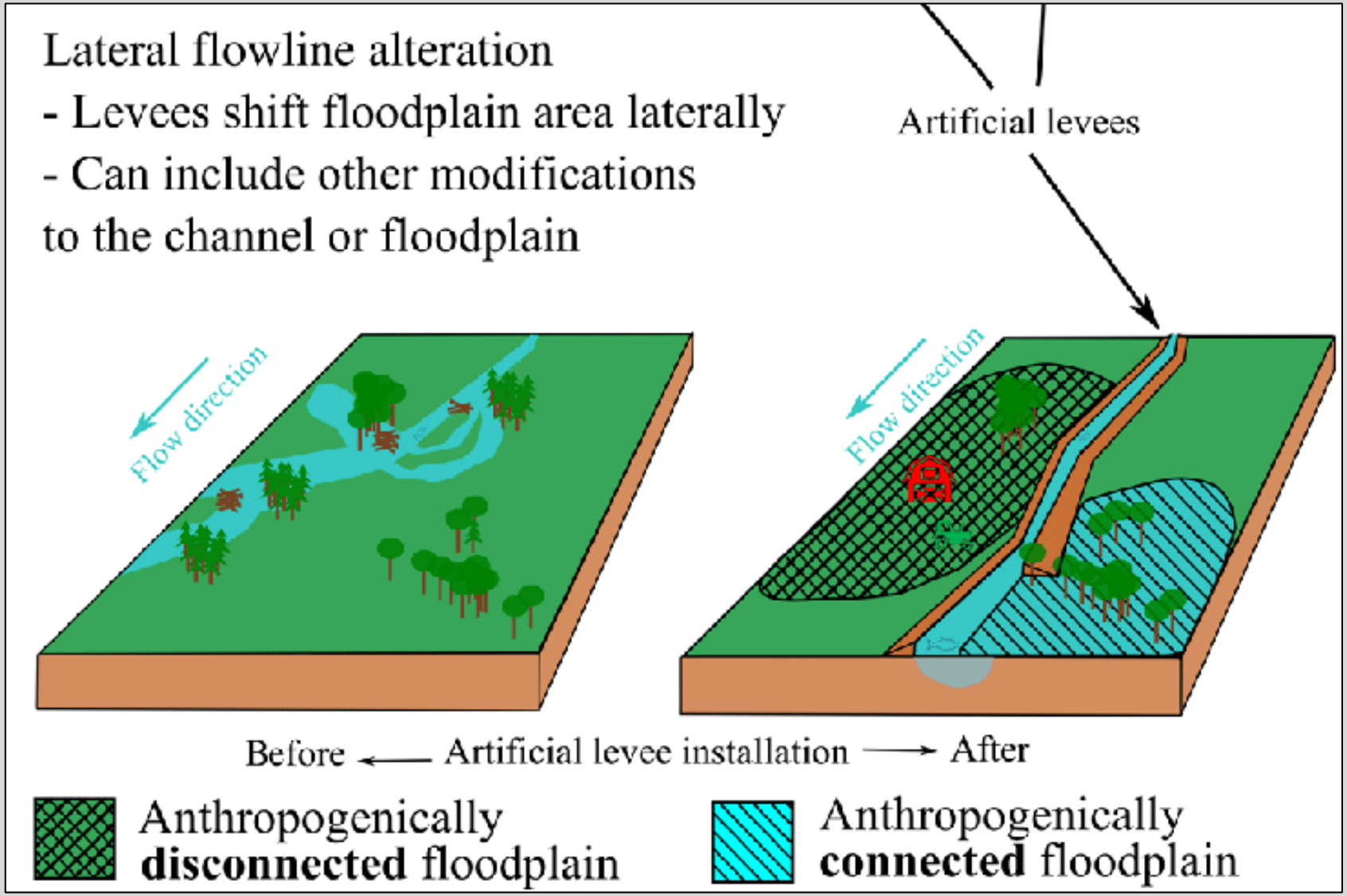


A Healthy Bosque has:

1. Galleries of Rio Grande cottonwood or Gooddings willow
2. Overhead canopy
3. Developed understory of shrubs, small trees, and forbs
4. Floodplain connectivity

Floodplain

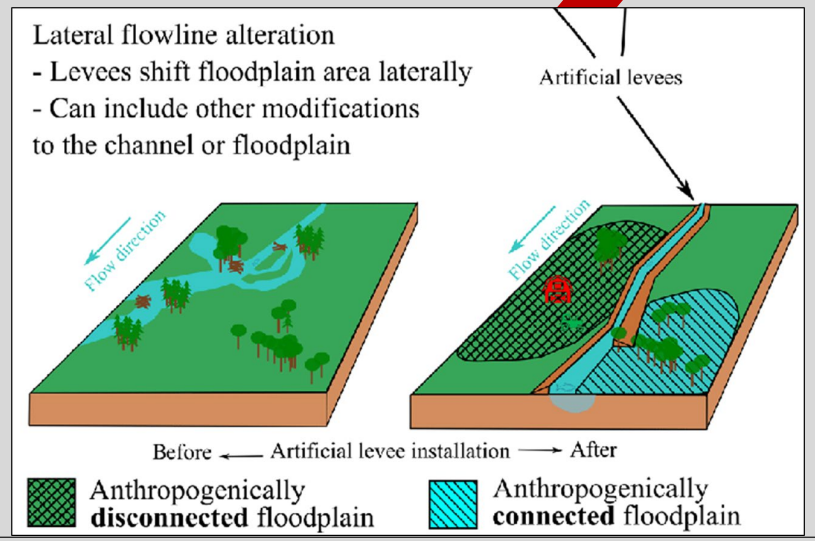
- Bosque species adapted to historic flooding regimes
- Disruptions to flood regime cause response in native vegetation

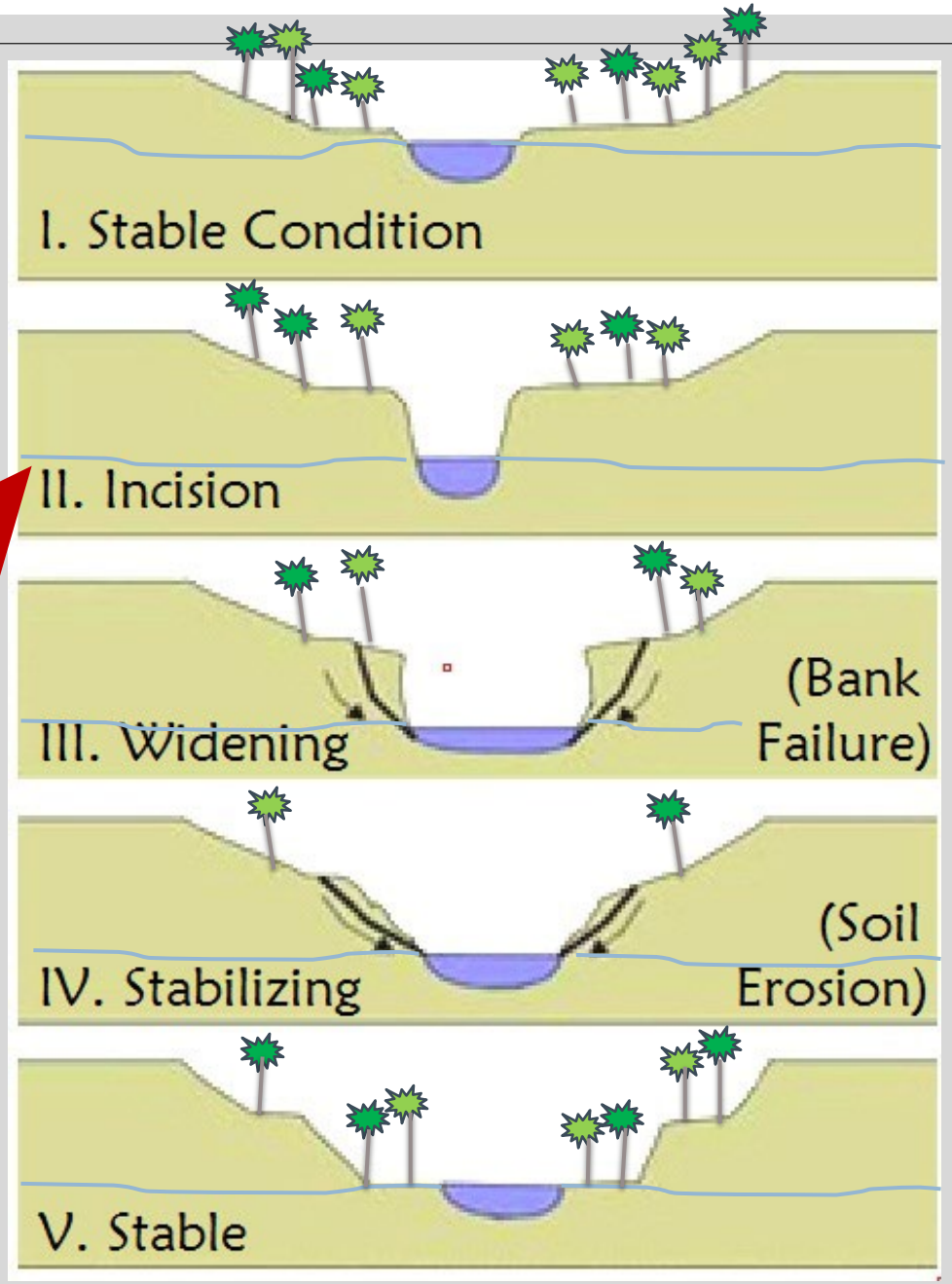


Knox et al., 2022

River Channelization

- Rio Grande has undergone intense channelization in the last century
- Floodplain disconnection increases distance to water table
- Channelization via levees has made disconnect semi-permanent





Invasive Species

Invasive Species: Russian Olive

- *Elaeagnus angustifolia*
- Europe, Asia origins
- No forage value
- 23 BTU

Ponderosa Pine ~21.7 BTU
Cottonwood ~ 16.8

Invasive Species: Saltcedar

Ponderosa Pine ~21.7 BTU
Cottonwood ~ 16.8

- *Tamarix chinensis/ramosissimus*
- Mediterranean/Asia origins
- Poor forage
- Seasonably variable BTU's

Both

- Introduced as ornamental wind break/ bank stabilizer
- High fecundity
- High tolerance for drought, degraded soils
- Long-lived (~100 years)
- Form *dense* monocultures
- Wildfire concern
- Wildfire can promote growth, respro

Focus on SaltCedar: Ecology

- Similar water demand as cottonwood
  - But grows more densely
- Concentrates salts in leaves
- Leaf litter increases soil salinity
- Changes to soil microbiome
- Dissuade growth of native species

- Estimated economic impact of ~$3.8-$11.2 billion if eradicated over the next 55 years

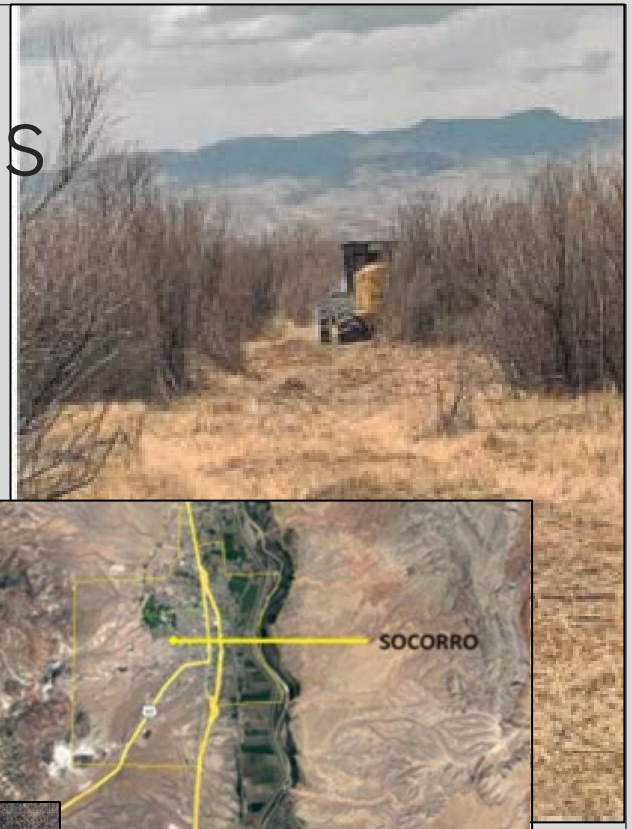
Focus on SaltCedar: Wildfire Concerns

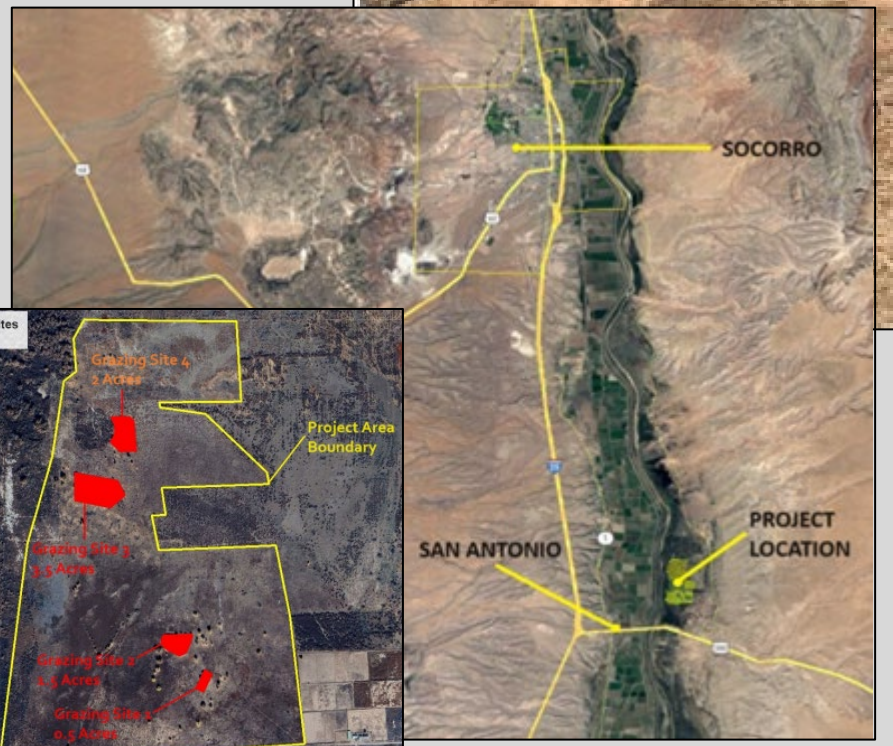
- Fast growth
- Ladder fuel
  - Extreme flame lengths up to 140 ft
- Burns HOT
  - Can ignite fuels not otherwise available
- Better post-fire recovery than native species

Local Efforts

County Saltcedar Management Efforts

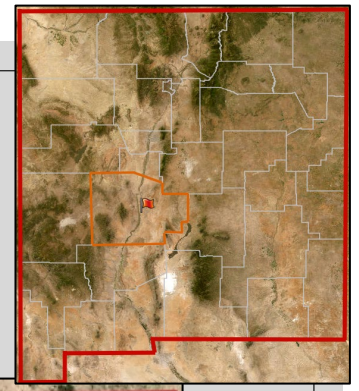
- Socorro County
  - Bosque fuel breaks in ~5 mile intervals
  - Soil Remediation Pilot project
  - Historic fuels reduction projects





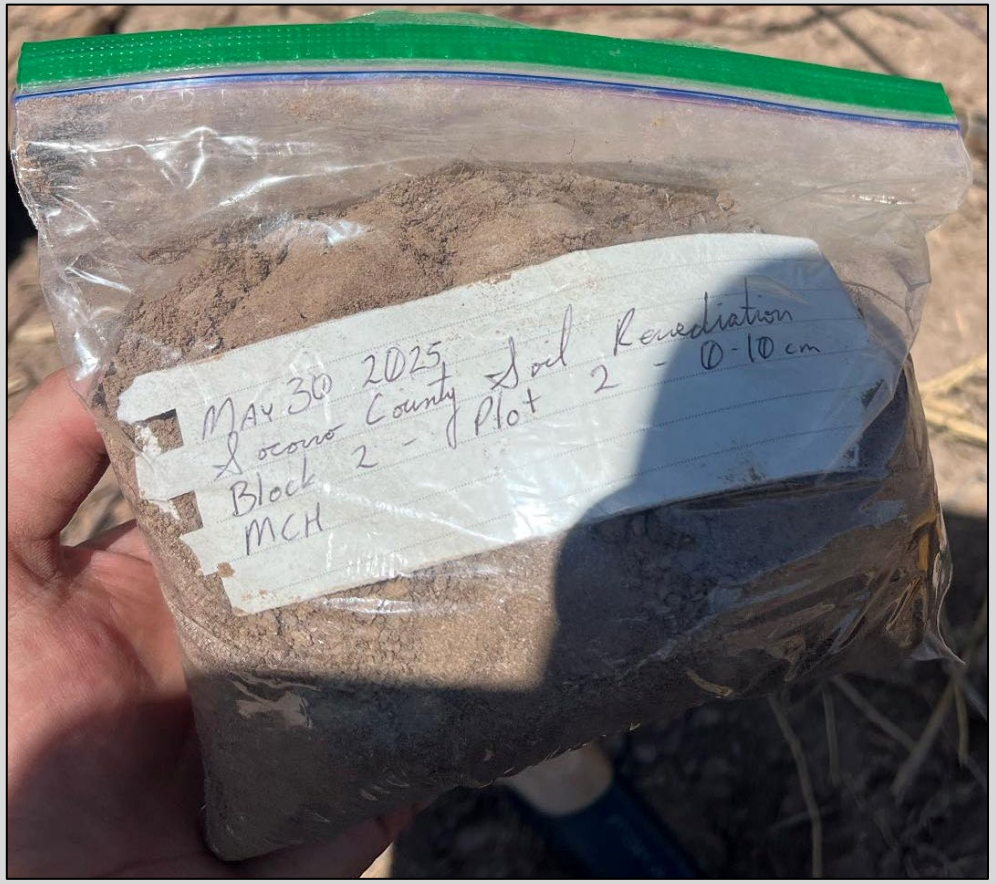
Pilot Study:
Bosquecito Soil Remediation

- 10 acres
- 4 plots
- All 4 treatments tested per plot
  - A – Soil bacteria
  - B – Mycorrhizal fungi
  - C – Mycorrhizal fungi
  - D – Control (no treatment)



Evaluation Criteria

- Best response in soil quality
- Sapling recruitment
- Most cost effective
- Can implement at a large scale



Questions?

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