

# Long Term Recovery of Native Perennial Grasslands

Utilizing Scraping, Seeding and Hydromechanical  
Obliteration Treatments: **A 5-Year Report**



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Central Coast - SFBR

Google earth

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Data CSUMB SFML CA OPC



# Environmental Conditions

- Grassland surrounded by coast live oak forest
- Average Annual precipitation 23"
- Soils: Silty loams, some clay fractions



# Site Constraints

- Multiple use facility with emphasis on equestrian
- Regular waves of invasion
- Regular soil disturbance
- Sheet flow
- Tenant interest
- Cost effective



Photo: Liz Hall

# Stewardship Goals

- Increase percent of native cover
- Control and/or eradicate select weed populations
- Reduce erosion
- Aesthetics



Naturalized grasslands  
≠  
Native grasslands





# The Scrape





# Rice Straw and Wattles



# Seed Rain



Photo: S&S Seeds

*Bromus carinatus*, *Stipa pulchra*, *Elymus glaucus*

*Clarkia purpurea*,  
*Achillea millefolium*,  
*Sisyrinchium bellum*,  
*Lupinus nanus*,  
*Lasthenia californica*,  
*Eschscholzia californica*



12 weeks later





# Track Revegetation [SS1]: Pilot Study

September 2008





December 2008



# SS1: December 2008





# SS1: April 2009





SS1: April 2010



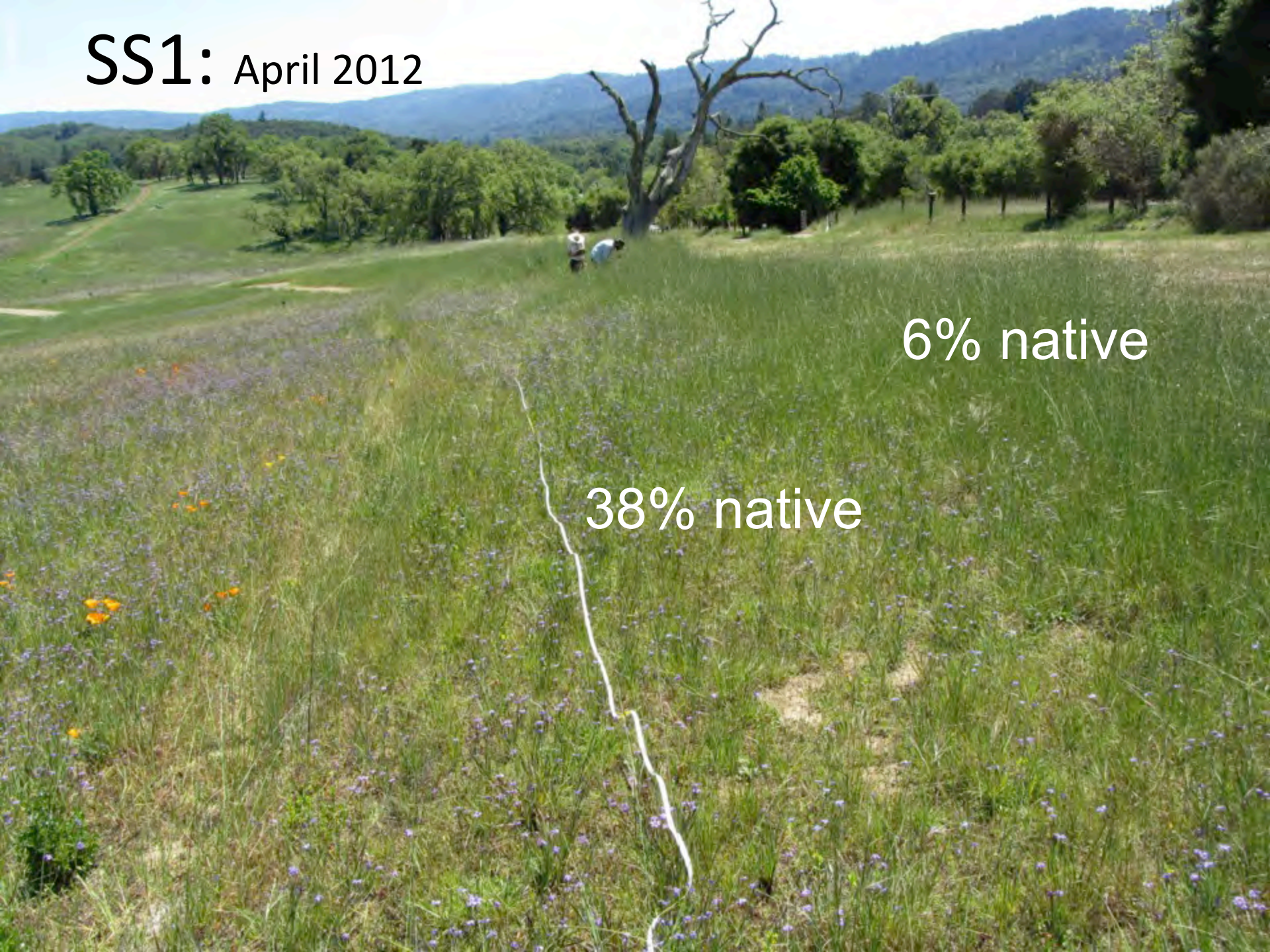


SS1: May 2011





SS1: April 2012



6% native

38% native



SS2: April 2013





We handpulled were thistles: *Carduus pycnocephalus*, *Cirsium vulgare*,  
*Silybum marianum*



Estimated person hours:

30 year 1

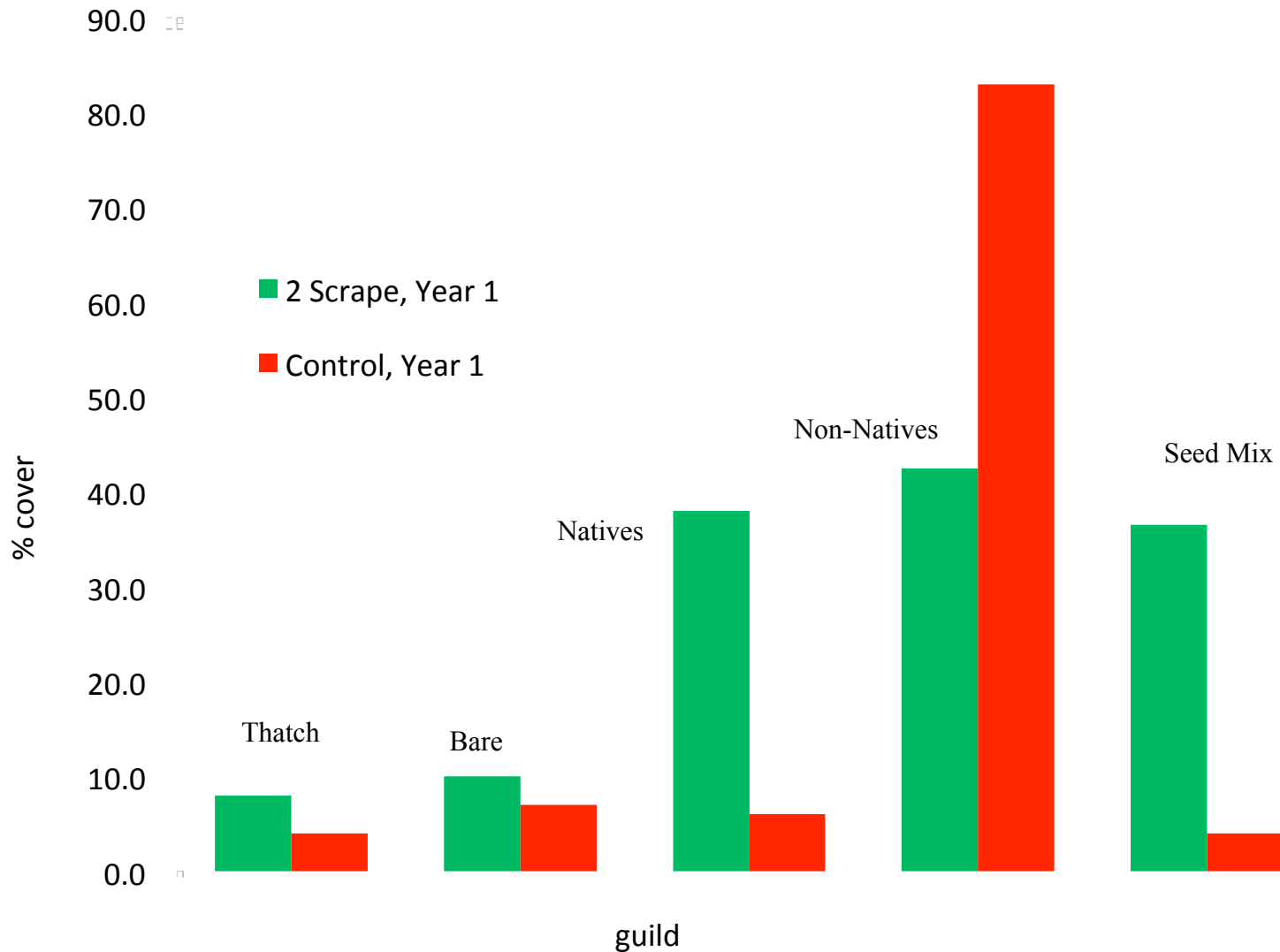
3 year 2

1-2 year 5



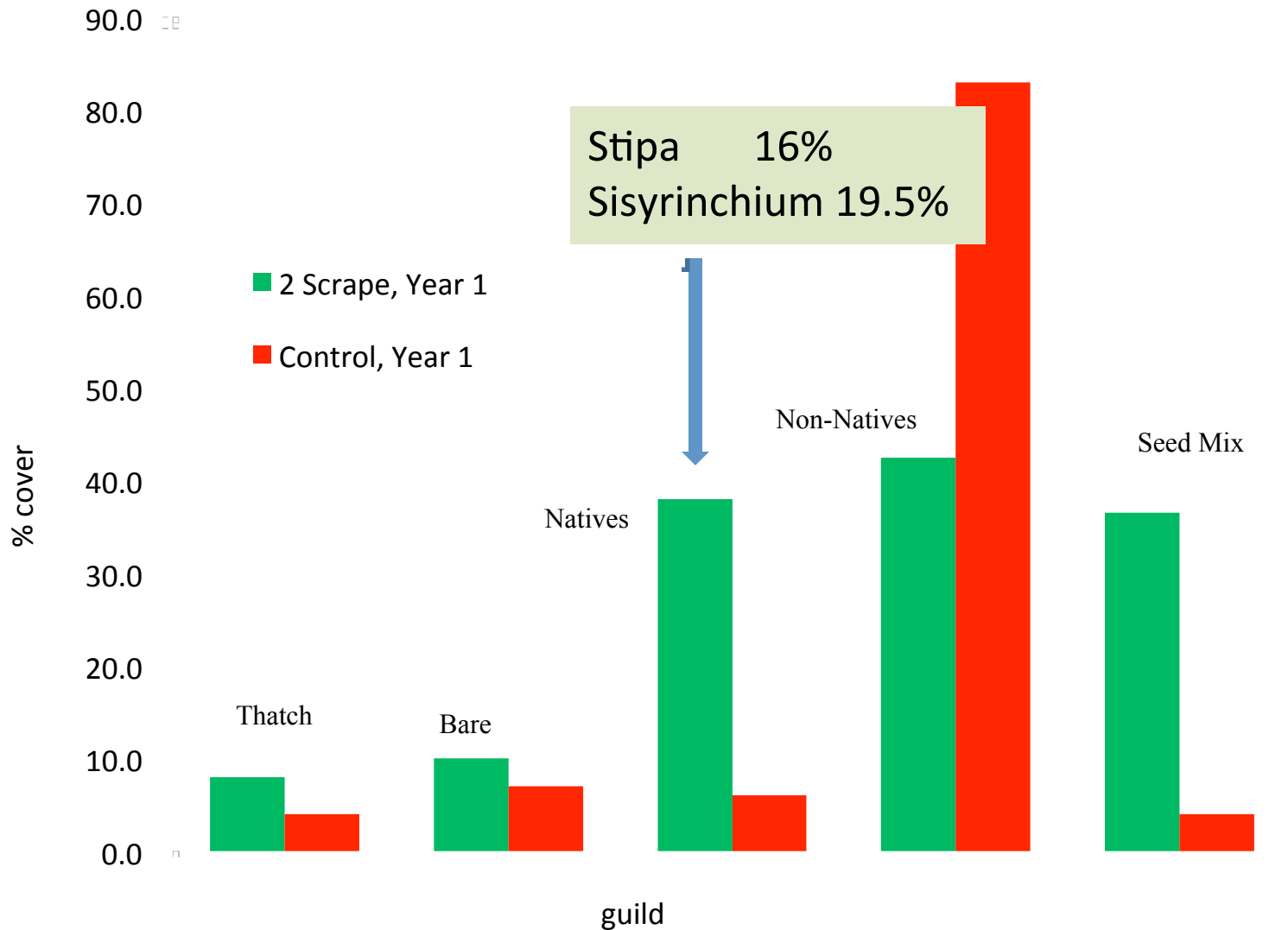
# Year 1 Scrape and Seed (2009) VS. Control in 2013

- 5 growing seasons later



# Year 1 Scrape and Seed (2009) VS. Control in 2013

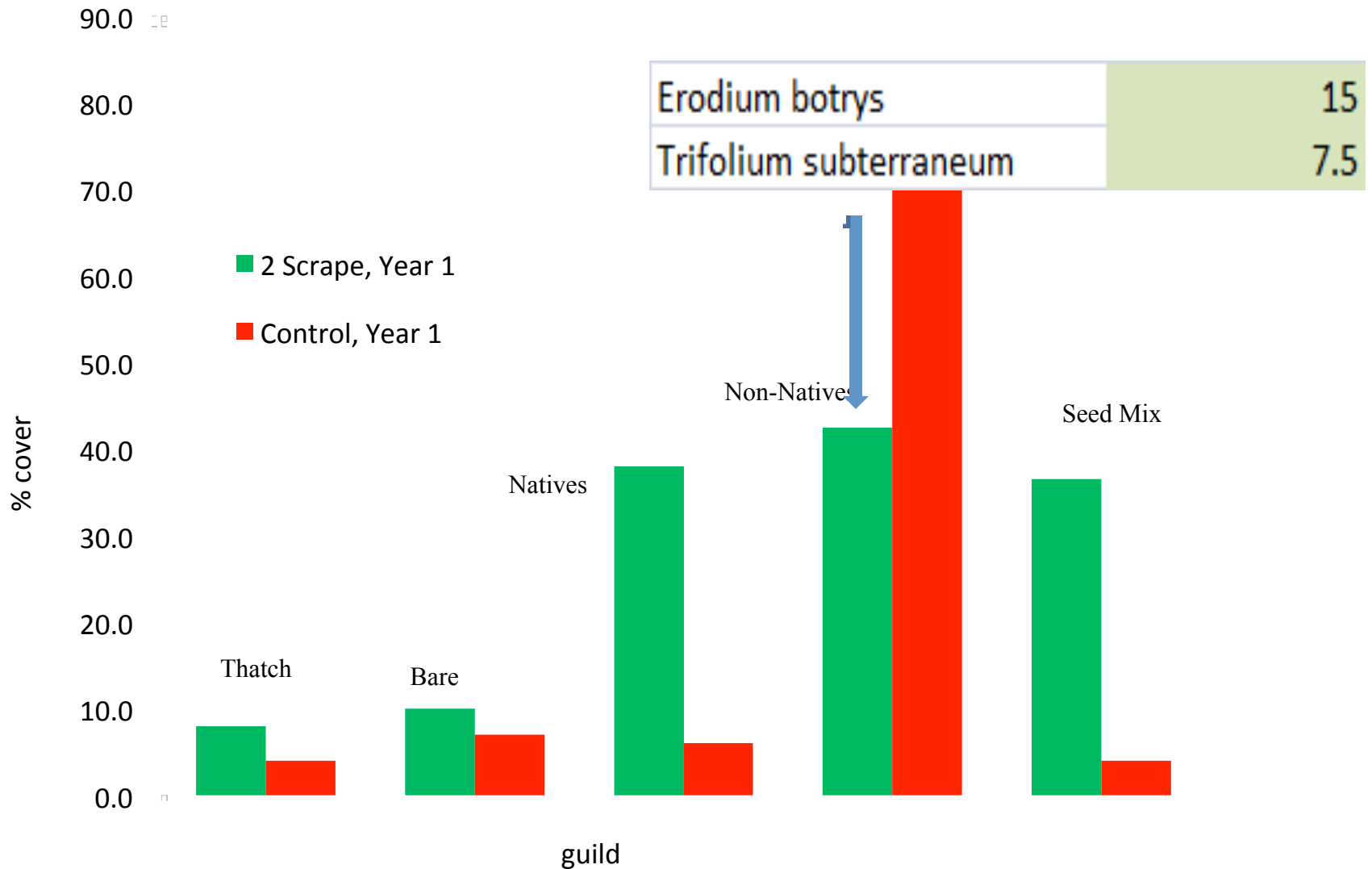
- 5 growing seasons later



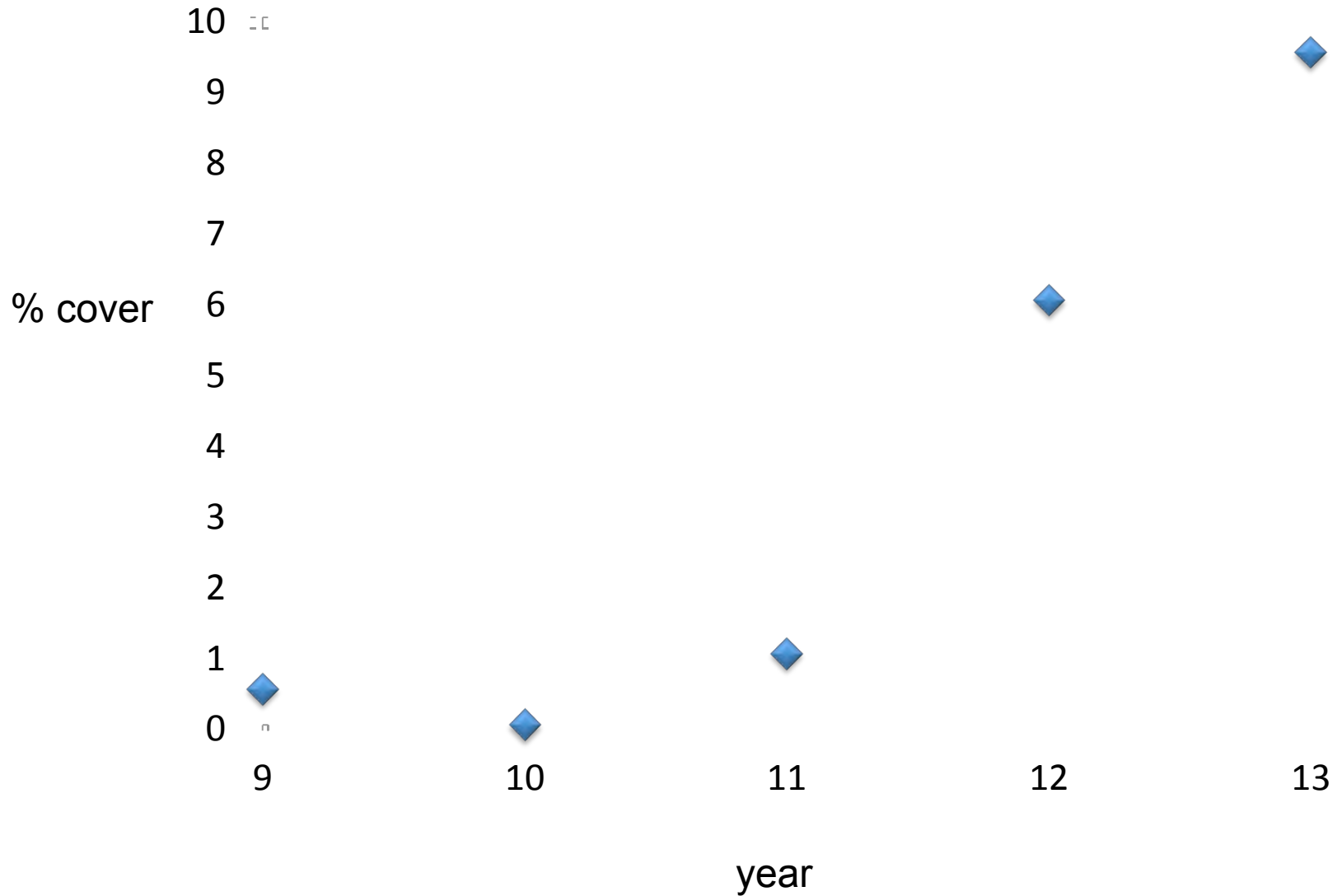


# Year 1 Scrape and Seed (2009) VS. Control in 2013

- 5 growing seasons later



# *Avena* invasion





# HMO

hydromechanical obliteration





HMO December 2010 – Year 2 after treatment





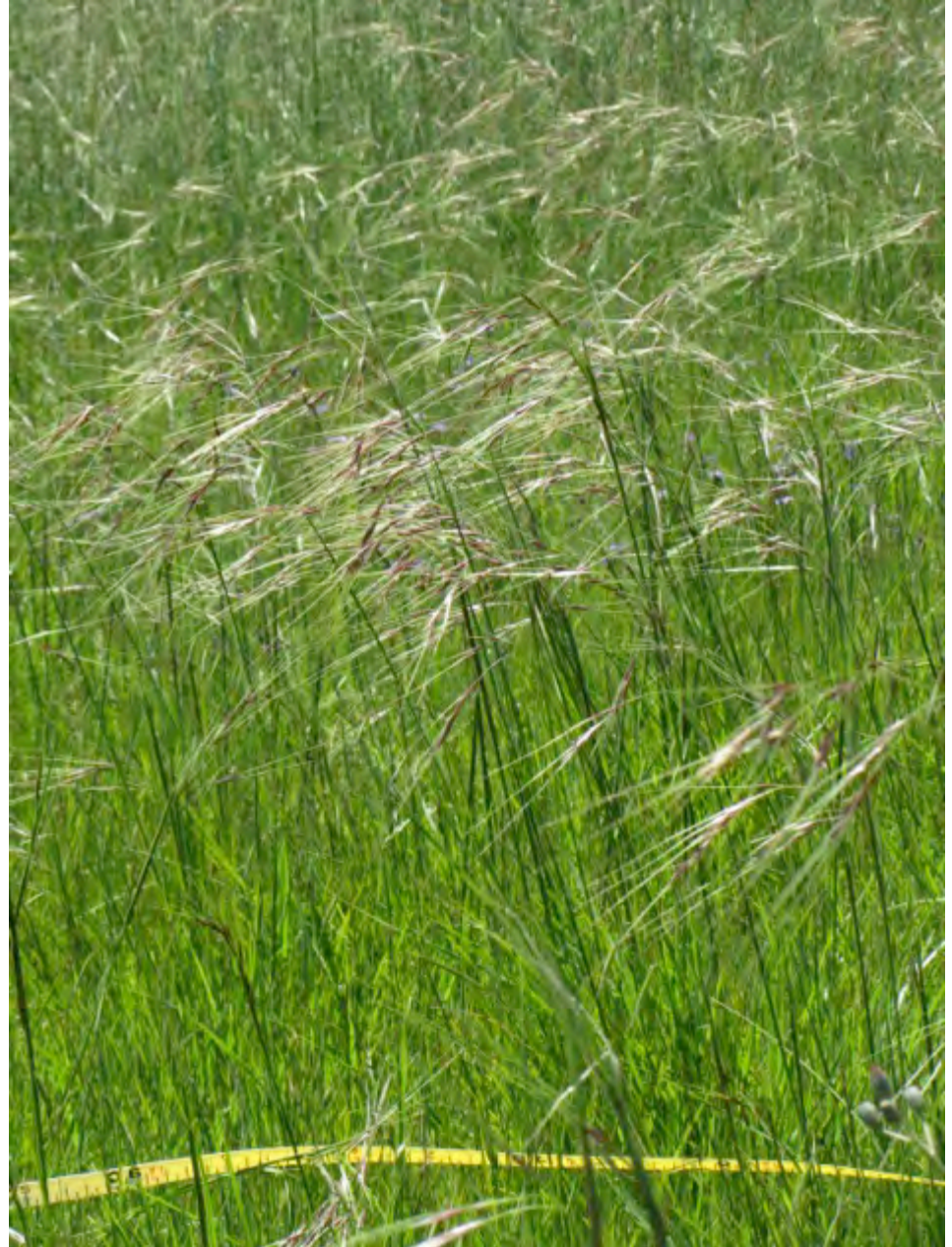




2013  
monitoring:  
(3 years post  
treatment)

38% Native  
perennial  
grasses (up from 15%)

10.5% Blue-  
eyed grass





# Results

- Non-native grasslands can be converted if the existing non-native seed bank is removed.
- Removal of a portion of the A layer of the soil will remove majority of viable non-native seeds.
- If scrape is done at proper depth, native grassland establishment can occur in 2-3 years.
- Native grasses remain dominant component of system for at least 5 years.
- Most non-native invasions are trivial

# Applications

- Ruderal
- Roadside
- Impacted & Disturbed areas





# Costs

- Equipment (\$1000/ac)
  - Seed (\$1000/ac)
- Wattles and Erosion Control (\$400/ac)
  - Labor (16 hours)

# The Next Step: Seed collection for Scrape and Seeding







SS4 scraped in December 20  
April 2013