

Towards Eradication of *Lepidium latifolium* at Paramount Ranch:

control methods and a test of
restoration treatments

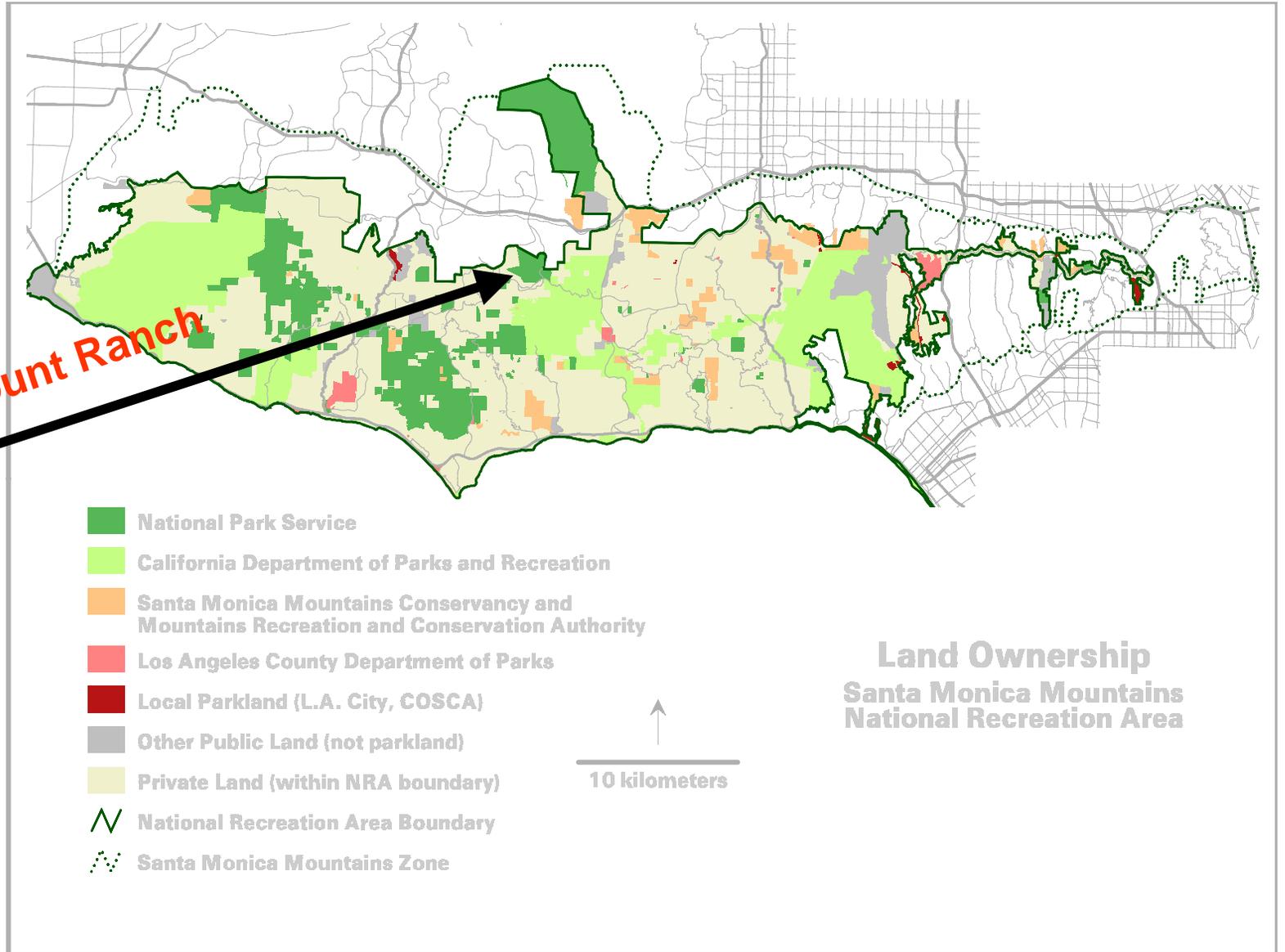
Christy Brigham, PhD
National Park Service



Overview

- Background
- Initial treatments
- Restoration Experiment
 - Methods
 - Results
- Conclusions

Project Location



Background

- Lepidium relatively uncommon in southern California (only 132 occurrences in SMMNRA map)
- Approx. 10 acre infestation at Paramount Ranch
- Prior to treatment, cover was 95-100% Lepidium in infested area
- Impacts of Lepidium

Initial Treatment

- Spring of 2002, California EPMT brushcut approx. 1 acre
- In Spring 2003, treated with 2% glyphosate
- September 2003, surveyed area
 - 70% control (Lepidium cover at site = 30%)
- September 2003, cut all re-growth
- November 2003, initiated restoration experiment

Lepidium after initial treatment



Photo taken November 2003

Restoration Experiment:

- No reference condition
- Does diversity matter in suppressing weeds?



Restoration Experiment: Design

- Square meter plots
- 25 one gallon plants per plot
- Control (5 plots)
- Dig only (5 plots)
- Shrub monoculture (10 plots)
- Grass monoculture (10 plots)
- 5 species (10 plots)
- 10 species (10 plots)

Restoration Treatment Details

- Shrub Monocultures
 - *Artemisia californica* (5 plots)
 - *Rosa californica* (3 plots)
 - *Malocathmus fasciculatus* (2 plots)
- Grass Monocultures
 - *Muhlenbergia rigens* (5 plots)
 - *Nassella pulchra* (5 plots)



Multi-species Plots

- 2 five species mixes
- 2 ten species mixes



The California EPMT using pulaskis to excavate plots



The plants just before installation.
This is a 10 species mix.



Planting



Immediately after planting



Plots at Time of Sampling

Control plot



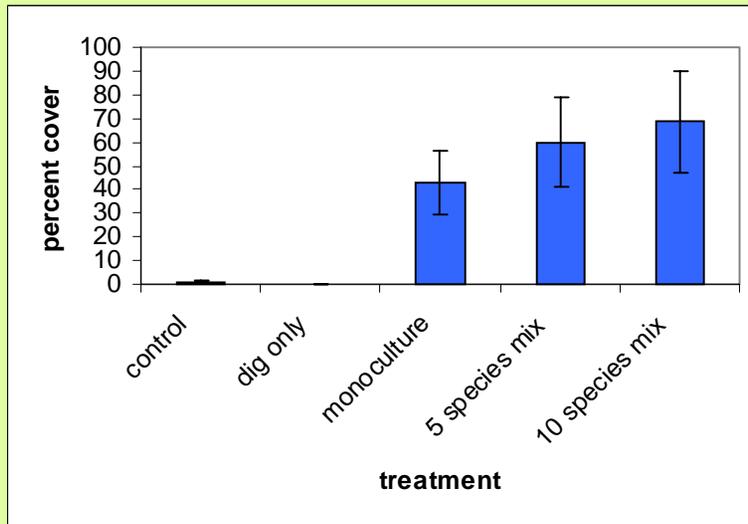
10 species mix plot



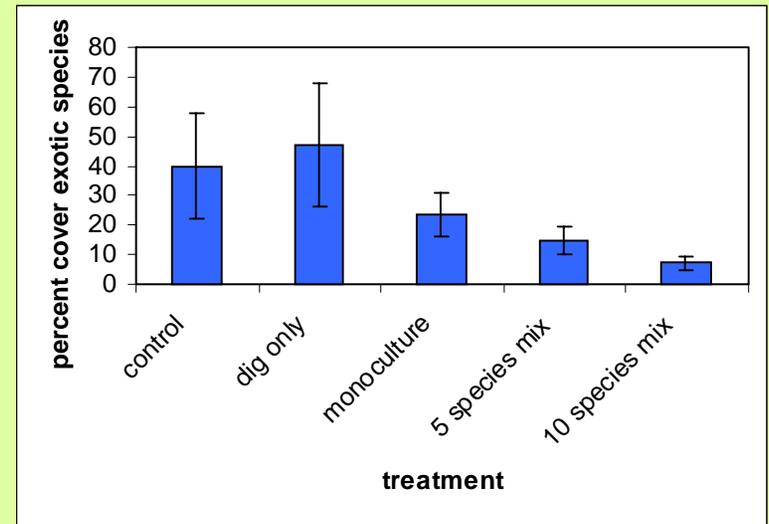
Note Lepidium in plots

Results of Restoration Treatments

Effects on native species cover

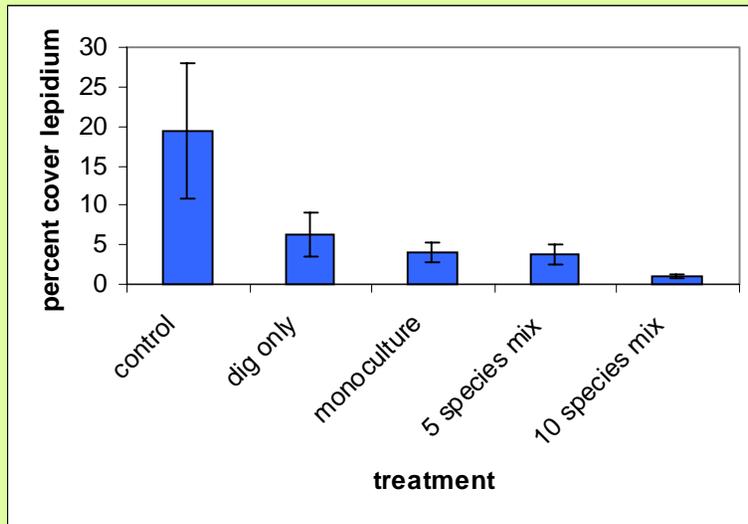


Effects on exotic species cover

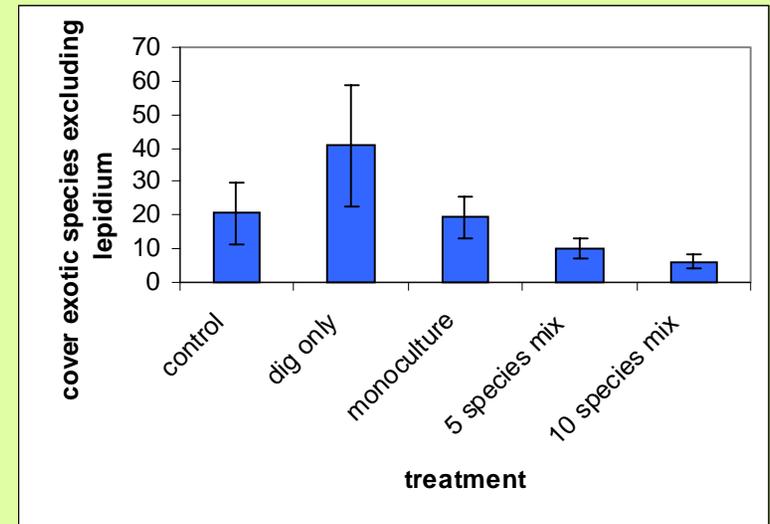


Results: Lepidium vs. Other Exotics

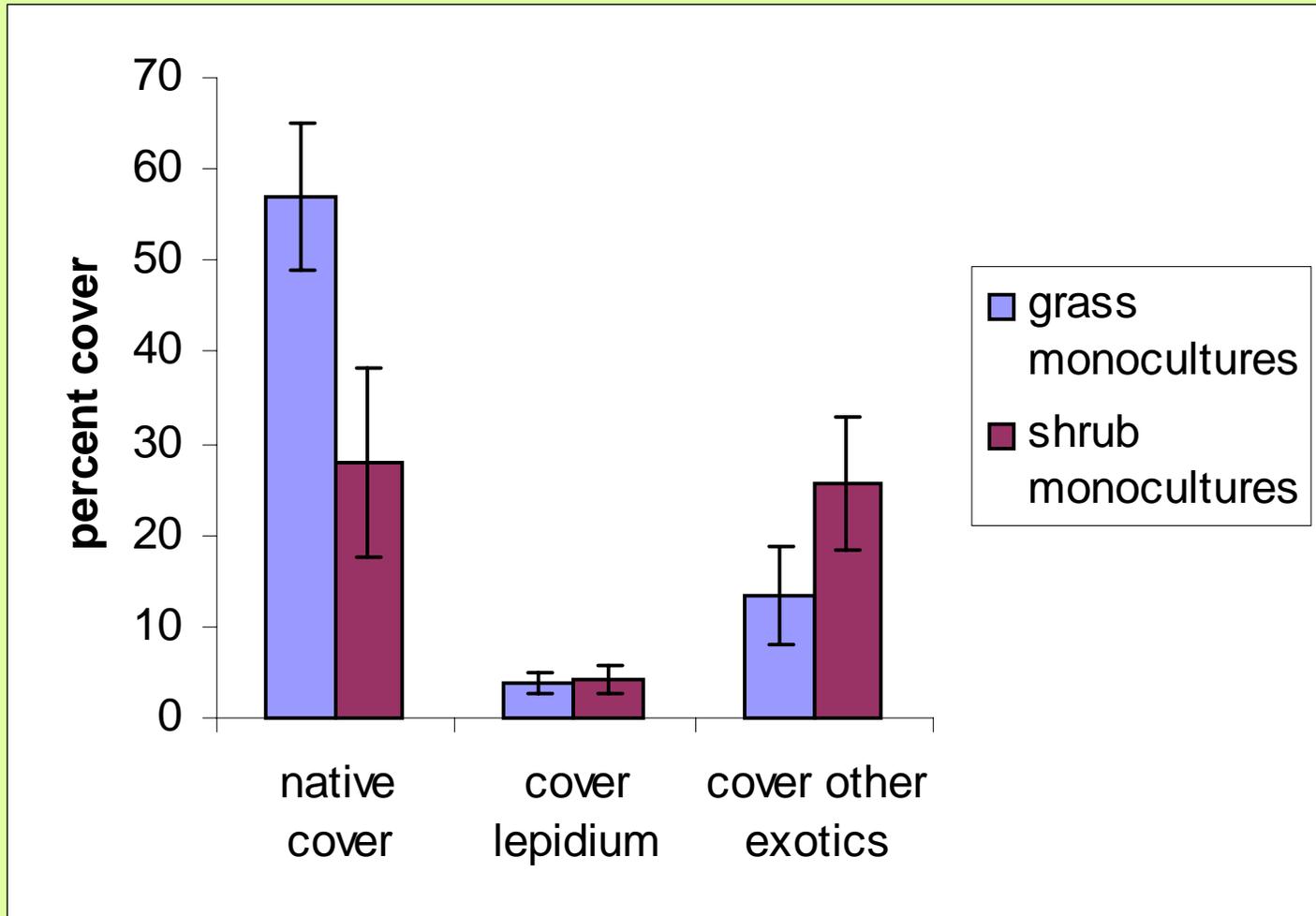
Effects on Lepidium cover



Effects on exotics other than Lepidium

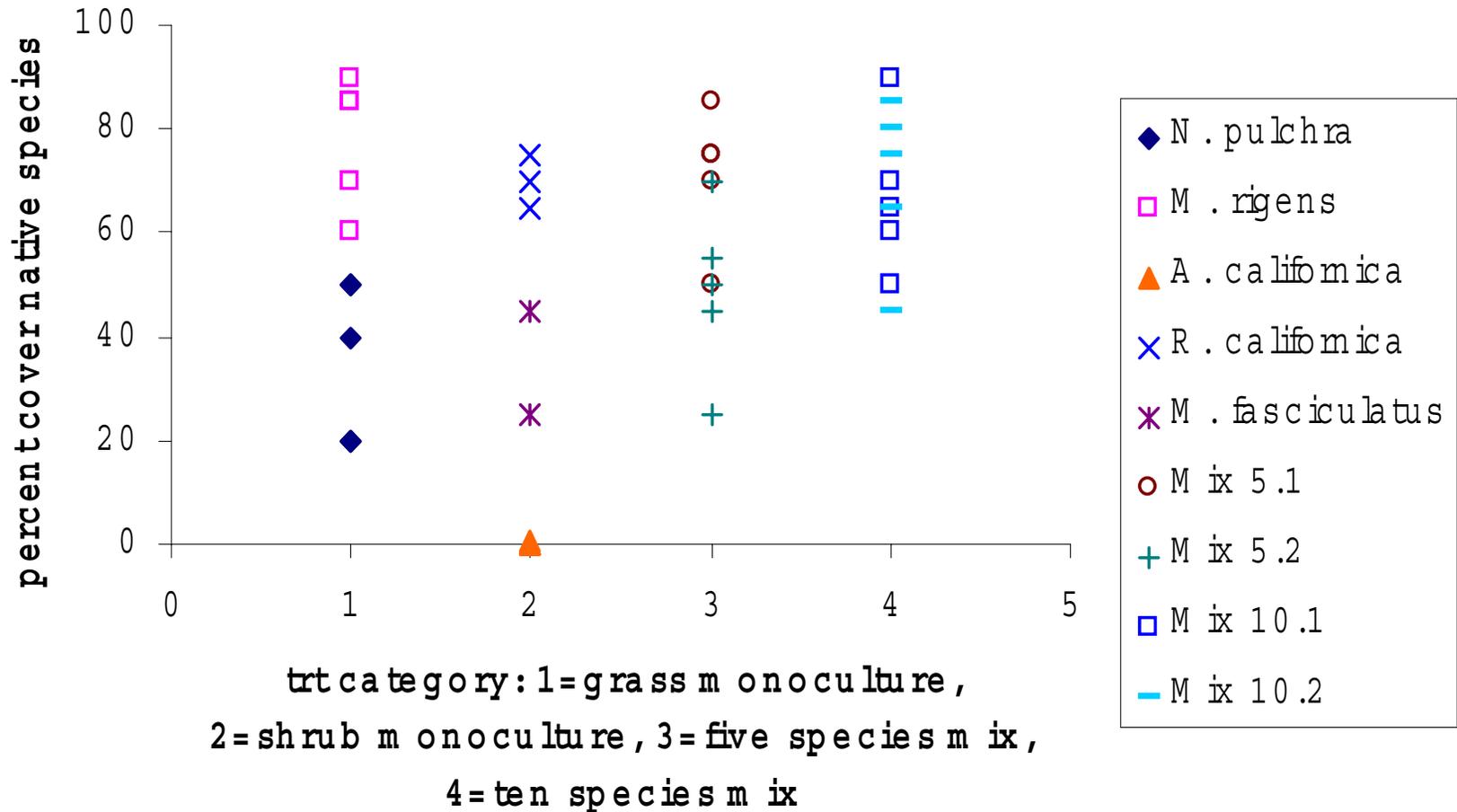


Results: Grasses vs. Shrubs



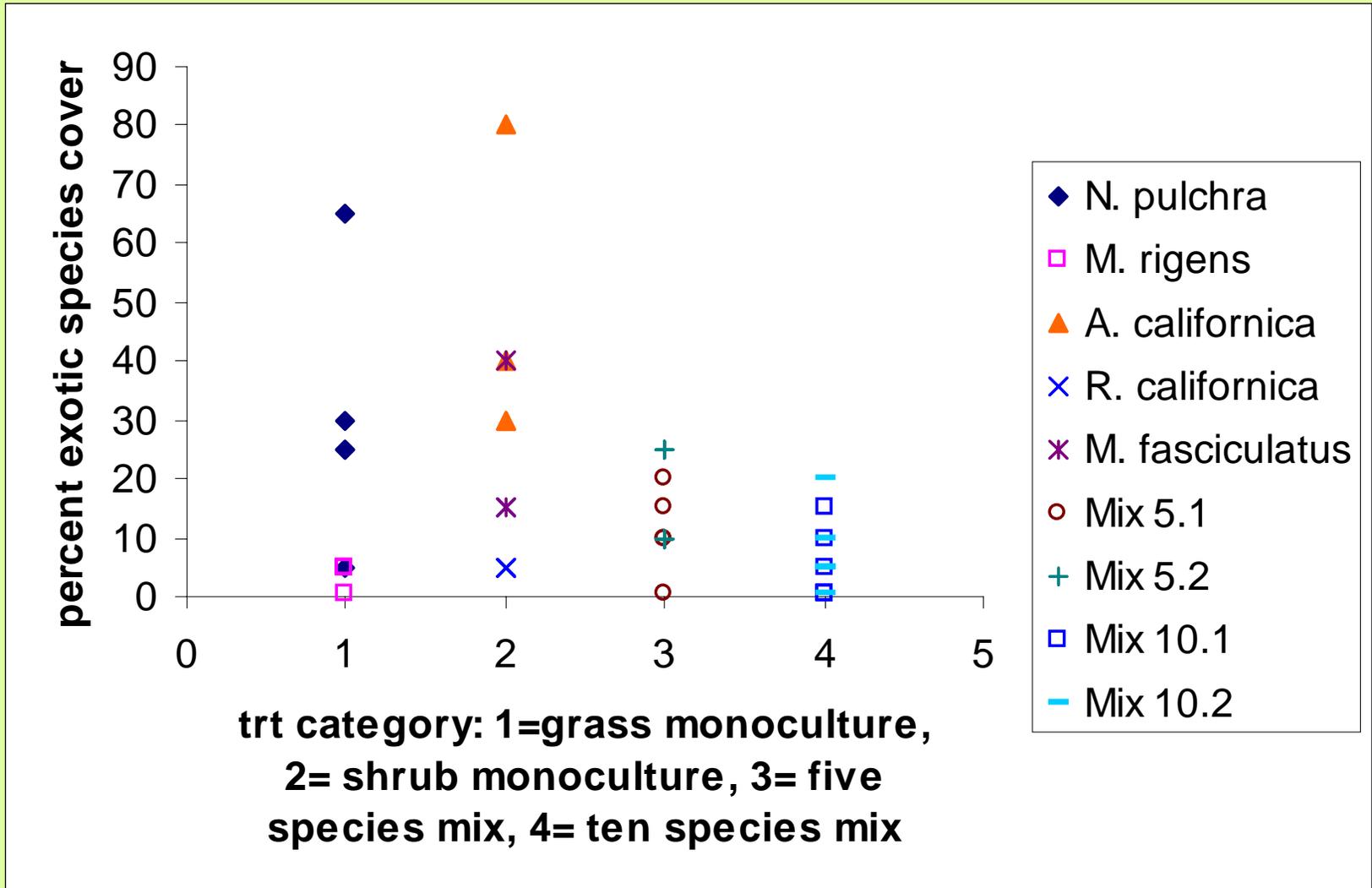
Results: Comparison of Plantings

Effects on native cover



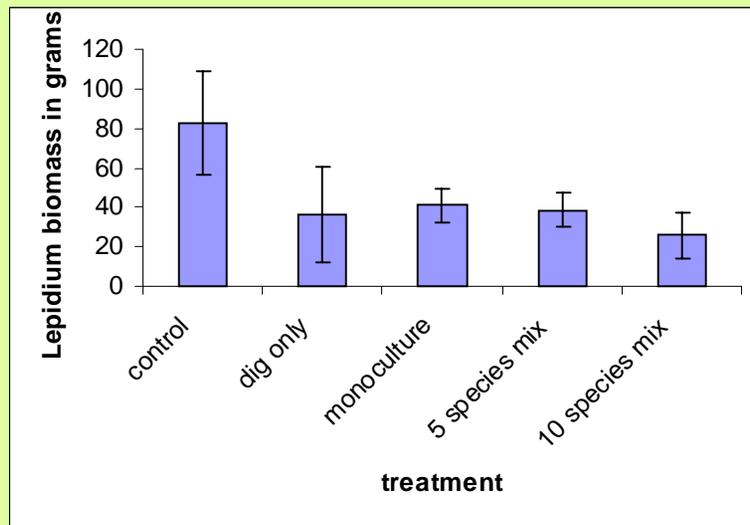
Results: Comparison of Plantings

Effects on exotic species cover

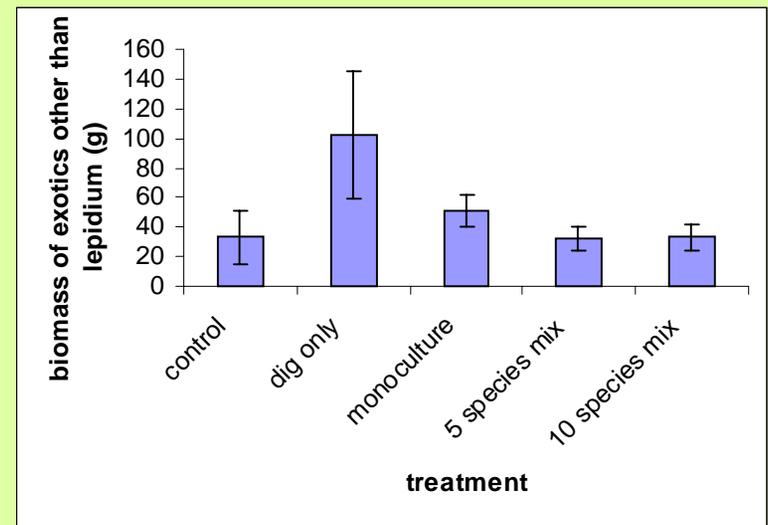


Results: Exotic Species Biomass

Effects on *Lepidium* biomass



Effects on other exotic species biomass



Results Summary: Native Cover

- Treatment had a significant impact on native species cover ($F = 12.51$, $p = 0.000$)
 - High diversity plots had highest native cover
 - 5 and 10 species not different
 - 5 and 10 species higher than monocultures, control, and dig only

Results Summary: Lepidium

- Treatments had significant impact on Lepidium cover ($F=7.176$, $p=0.000$)
- Dig only, monocultures, 5 species, 10 species not significantly different

Results Summary: Total Exotic Species Cover

- Treatments had a significant effect on total exotic species cover ($F=5.598$, $p=0.001$)
- Control and dig only not significantly different
- 5 and 10 species had significantly lower exotic species cover than monoculture, dig only, and control

Current Site Conditions



Conclusions

- Cutting and spraying worked
- No native seed
- Turning the soil impacted *Lepidium*
- Restoration plantings reduced exotics
- No effect of restoration plantings on *Lepidium*

Future Work

- Continue to maintain and monitor plots
- Establish larger plots with restoration plantings
- Try other native species
- Expand project area, alternating planting and control only areas
- Try larger plots with roto-tilling after cutting and spraying

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