Assessing non-target vegetation response in the wake of perennial pepperweed (*Lepidium latifolium*) eradication at the Cosumnes River Preserve

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Perennial Pepperweed Control Project

Determine an effective eradication method while monitoring the effect of experimental treatments on existing plant communities.

Treatment success:

Mow/broadcast spray herbicide application
(Rodeo® and Telar®)

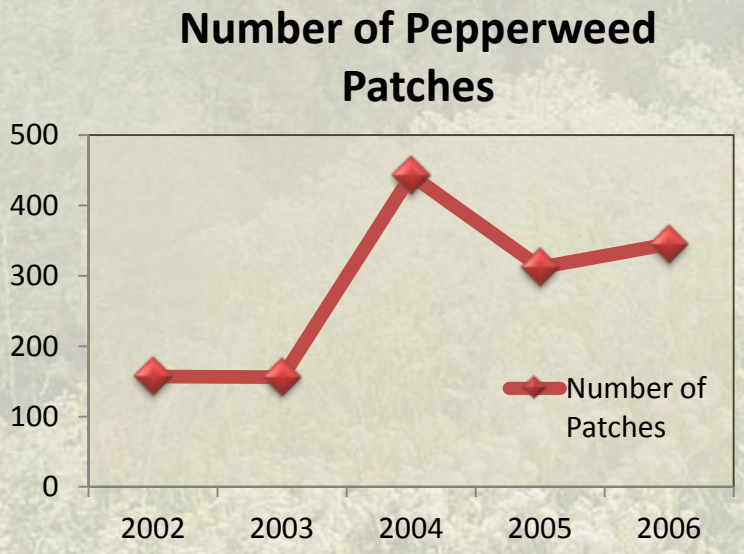
Non-target vegetation surveys:

Riparian Communities: Rodeo®
Grassland Communities: Telar®

Seed bank experiment:

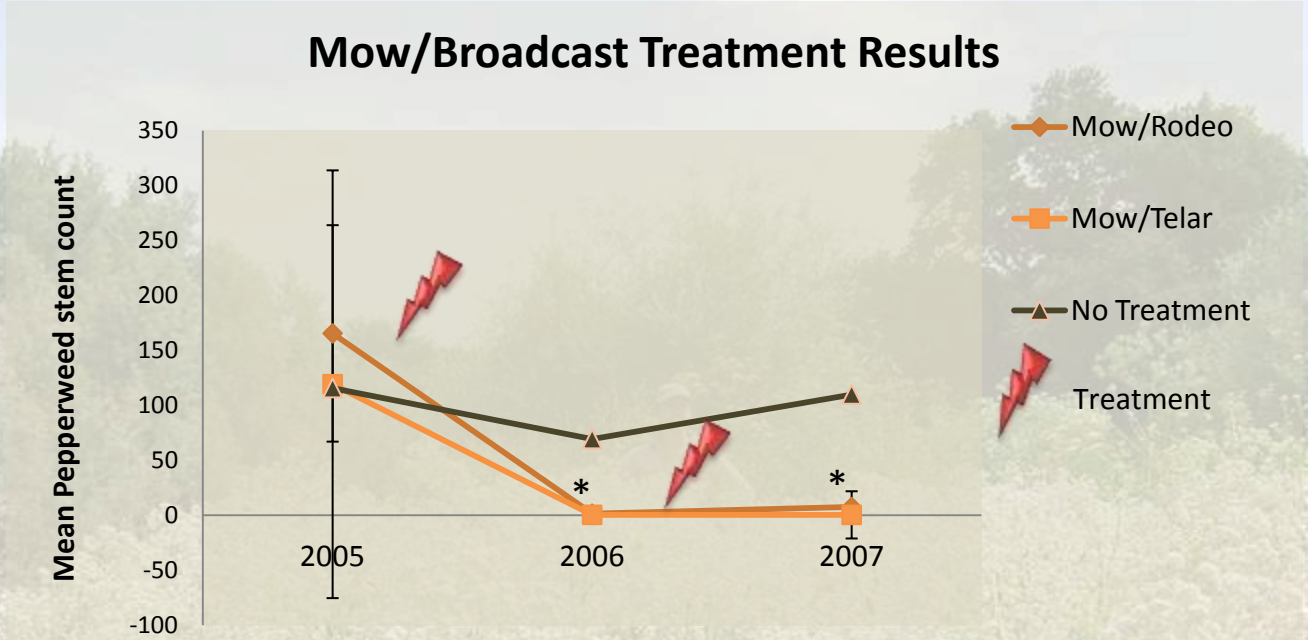
L. latifolium remained in the seed bank post-eradication

Lepidium latifolium at the Cosumnes River Preserve



Perennial Pepperweed Plot Treatments	#of Plots
Controls -28 Pepperweed-Control -24 No Pepperweed -Control -16 Mow-Control -16 Cut-Stem-Control	84
Mow/Broadcast -16 Mow+Broadcast Telar® -16 Mow+Broadcast Rodeo®	32
Cut-Stem -16 Telar® (low concentration treatments only) -32 Rodeo® (low and high concentration treatments)	48
Tarp sites -12 mow+tarp -12 mow+rototill+tarp	24
TOTAL	188

Treatment Results



Both mow/broadcast spray treatments significantly reduced perennial pepperweed populations in all treated experimental plots

Mow treatment

Grassland

Rodeo® Treatment

Riparian

Datura stramonium

Non-target vegetation

Eschscholzia californica

191 Species

100 Native

91 NonNative

(Five on Cal-IPC **High Impact** list)

98 Annual

73 Perennial

9 Tree/Shrub

3 Vine

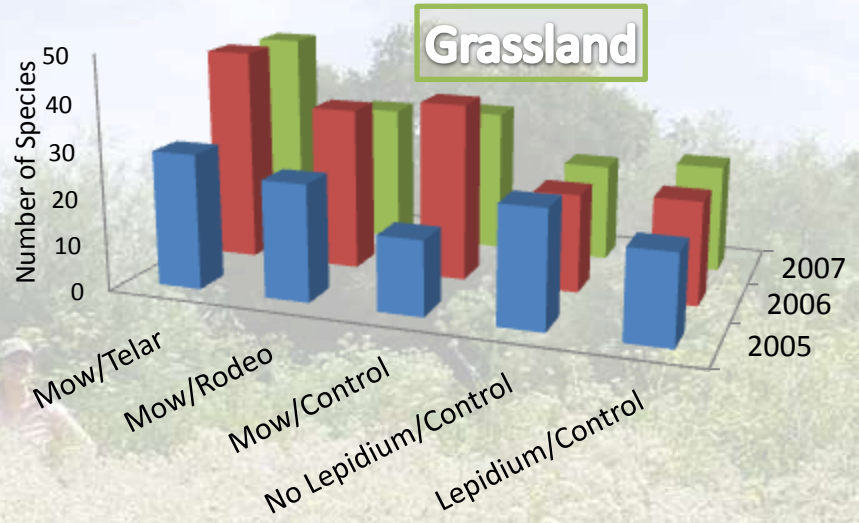
Mimulus pilosus

Triphysaria eriantha

Alpha Diversity

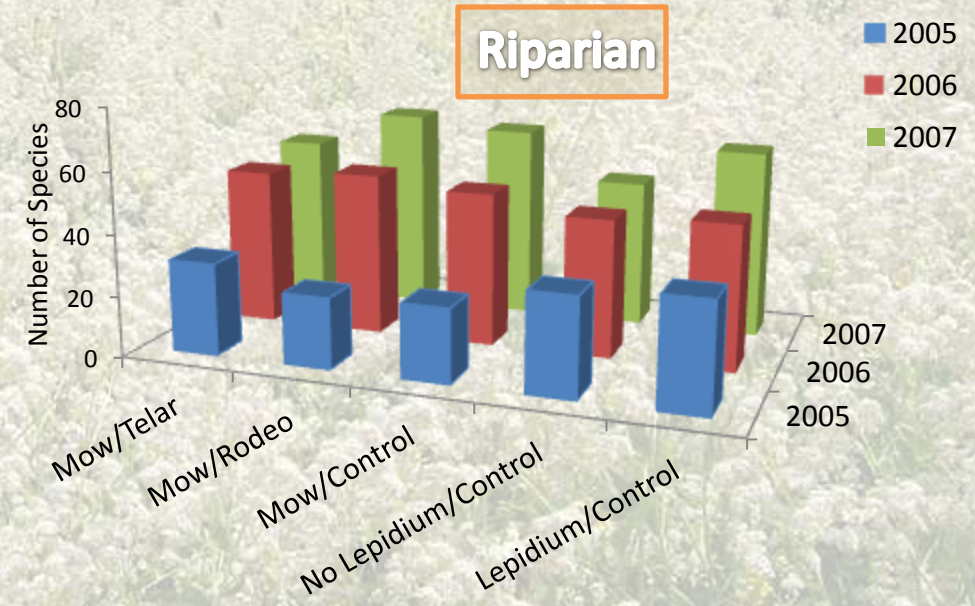
Grassland:

- Species richness increased in 2006 after initial eradication in grassland communities
- Species richness also increased in mow/control plots



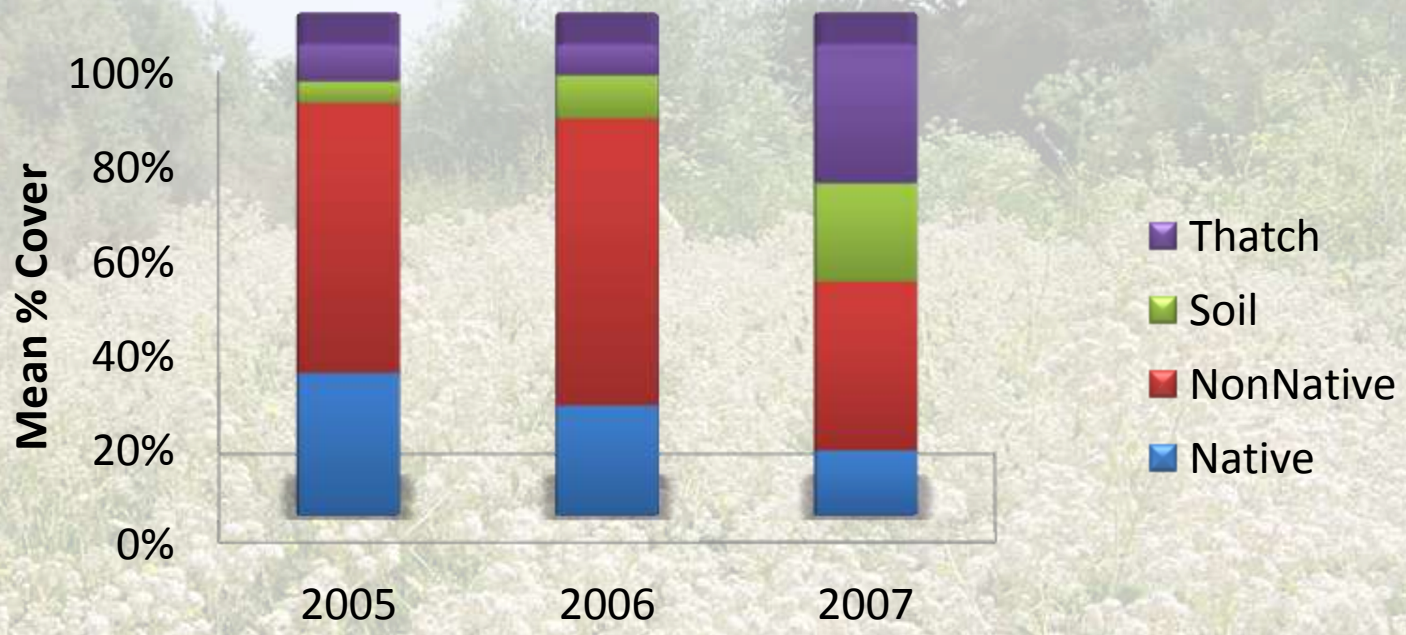
Riparian:

- Species richness increased in 2006 after initial treatment, and continued to increase after two treatment cycles
- Species richness also increased in control plots!!

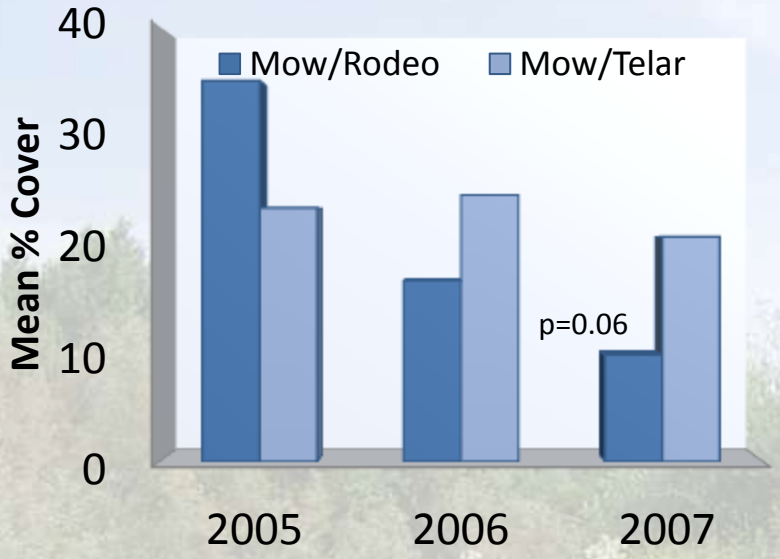


Grassland

% Cover in Mow Treatment Plots



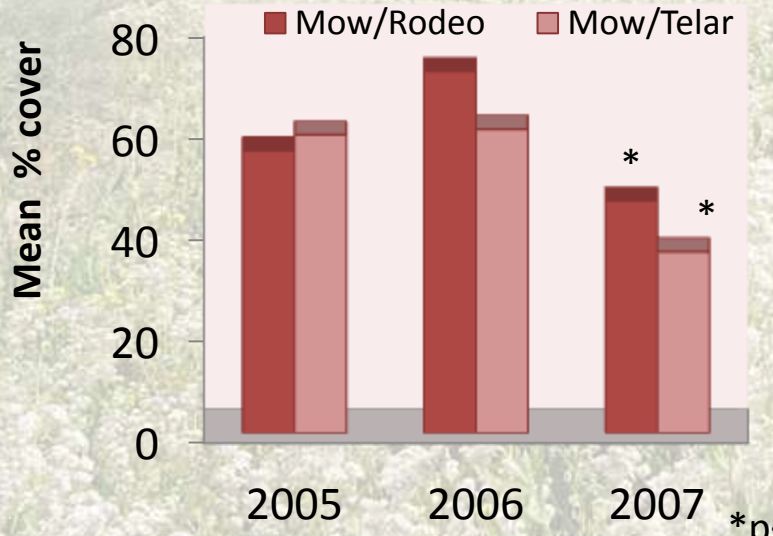
Grassland Native Cover



- Native cover does not change significantly in Mow/Telar® plots

- Native cover decreases (p=0.06) in plots treated with Rodeo® after two years of treatment

Grassland Non Native Cover

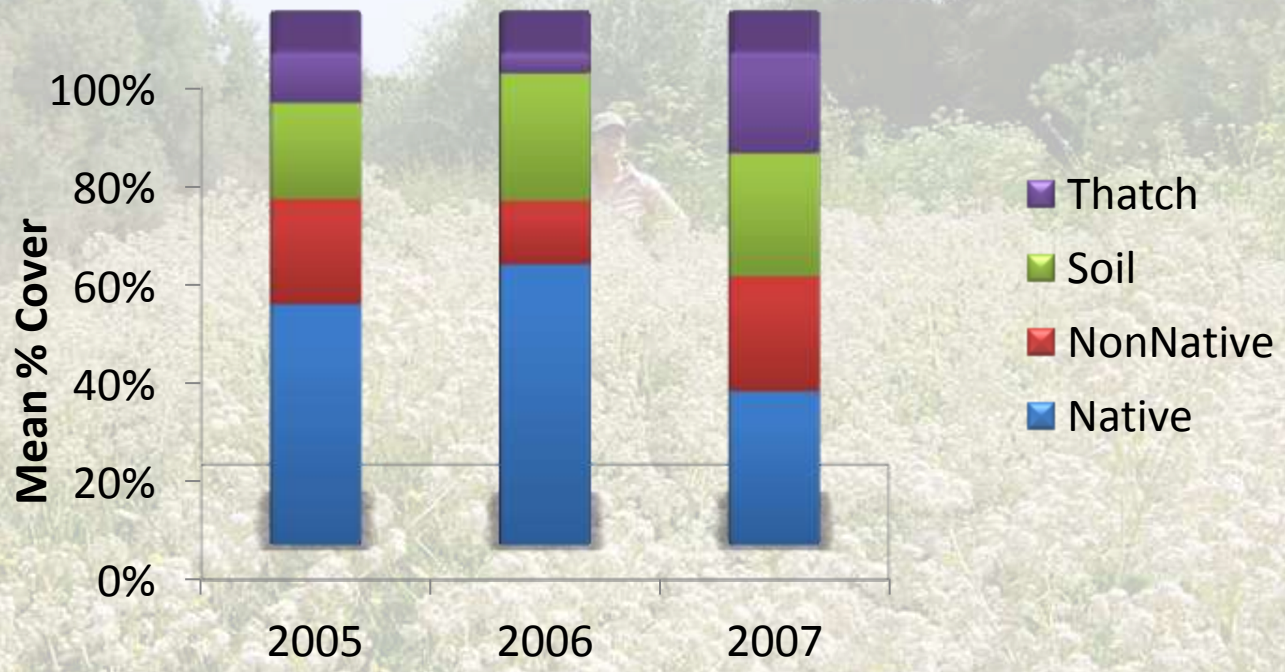


*p<0.05

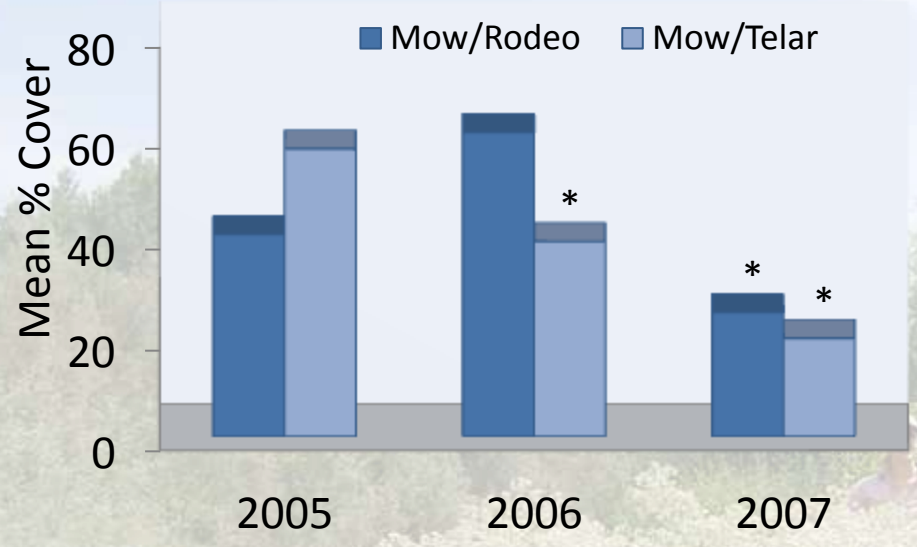
- Non native cover decreases in both Mow/Rodeo® and Mow/Telar® plots between 2006 and 2007

Riparian

% Cover in Mow Treatment Plots



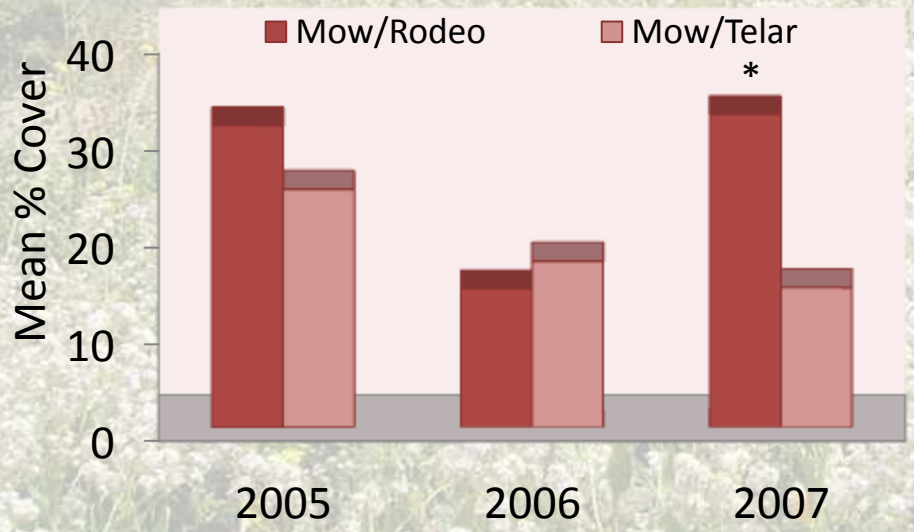
Riparian Native Cover



- Native Cover significantly decreased in Mow/Telar® plots in both 2006 and 2007

- Native Cover significantly decreased in Mow/Rodeo® plots after two years of consecutive herbicide application

Riparian Non Native Cover



- Non Native cover increased in Mow/Rodeo® plots from 2006 to 2007

- Non native cover decreased in Mow/Telar® plots post-treatment

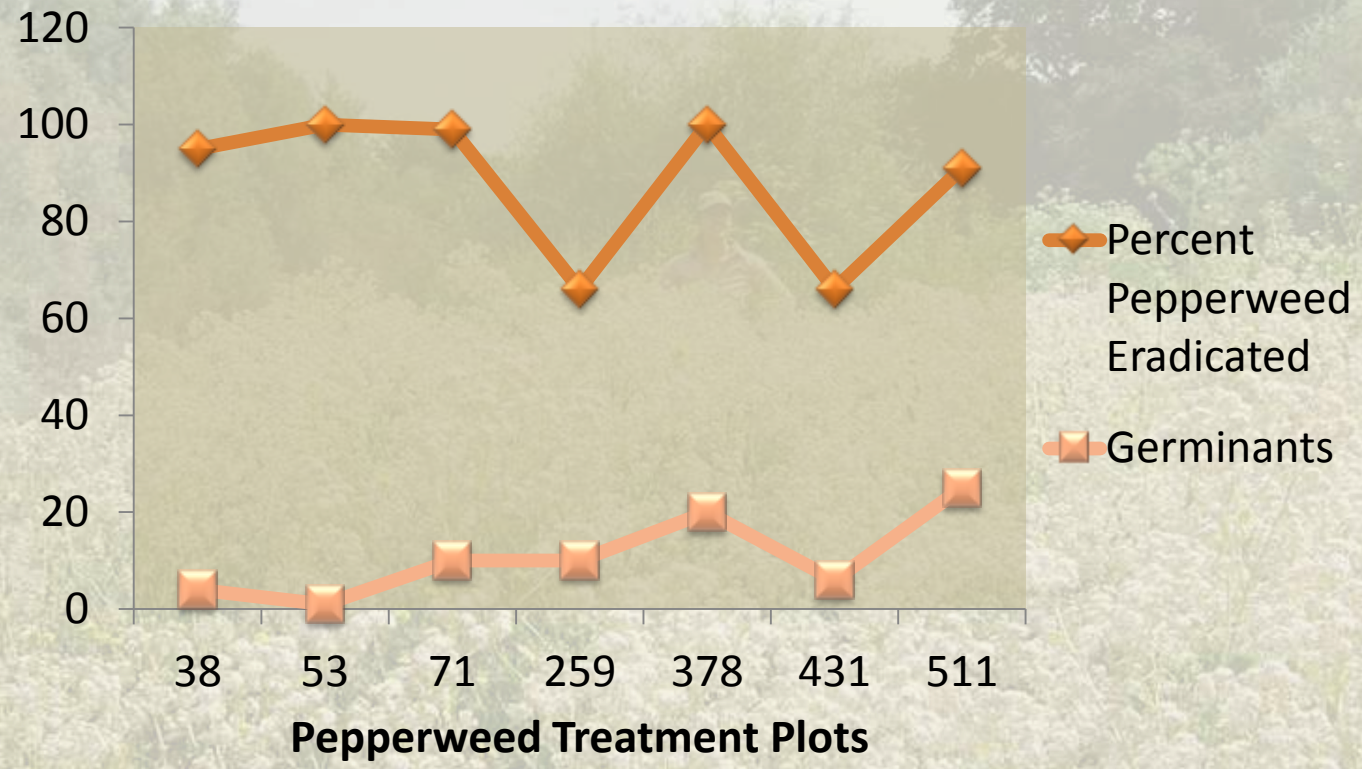
* $p < 0.05$

Seed Bank Experiment

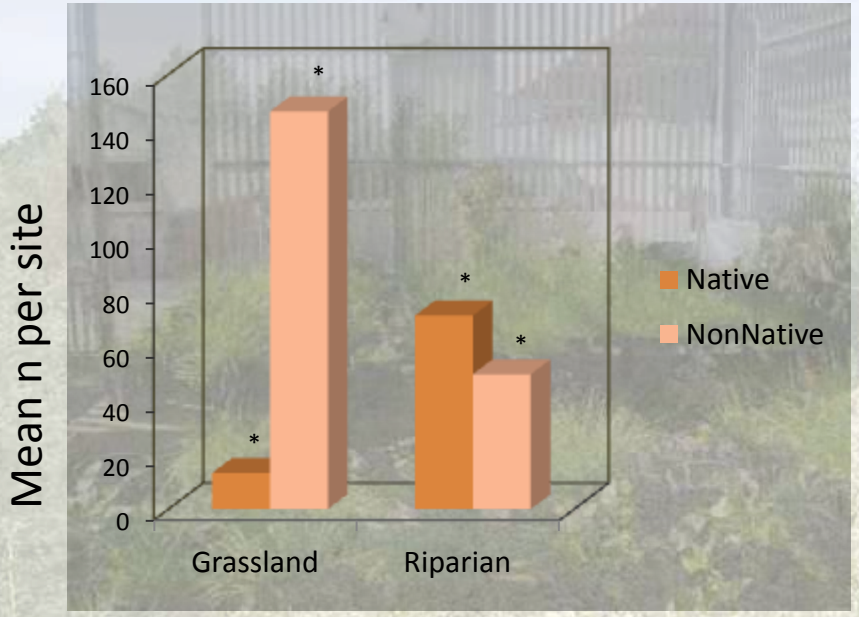
Soil samples were collected in late summer 2006 from experimental treatment plots.

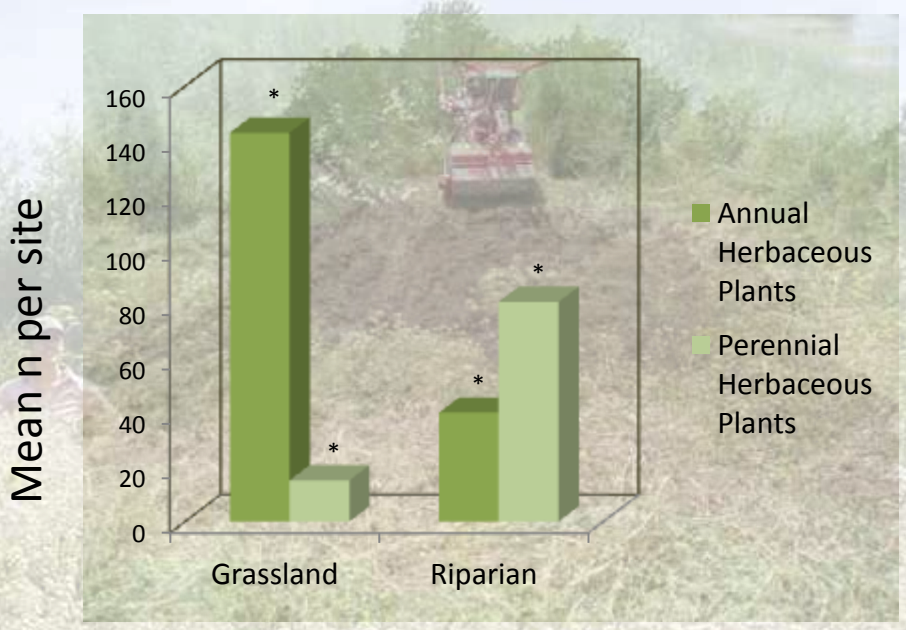
Samples were potted and germinants were identified, counted and removed from pots in a lath house for one year.

Pepperweed in the Seed Bank



Seed Bank Results





Grassland:

A significant proportion of germinants were non-native annual species.

Riparian:

Significantly more native, perennial species germinated in riparian seed bank pots.

* $p < 0.05$

Conclusions

Treatment success:

Mow/broadcast spray treatments

Cut-stem treatments?

Non-target vegetation surveys:

Rodeo® may be a better herbicide to use in riparian communities

Telar® may be a better herbicide to use in grassland communities

Seed bank experiment:

Pepperweed seeds viable in plots where it was “eradicated”

The **Future** of Pepperweed at The Cosumnes River Preserve

Large scale treatment at the preserve to stop spread while reducing *Lepidium* impact

Tarping Results: **June 2008**

Restoration?

Acknowledgements

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The Cosumnes River Preserve

http://baydelta.ucdavis.edu/pepperweed/
(under construction)

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Questions?

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☹ *Ludwigia* growing over tarp installed for pepperweed eradication ☹