



LuninatoR:

Invading California:
Impacts and best
management
practices for the
perennial grass,
Ehrharta erecta

Courtenay Ray

What do land managers want from
invasive species research?

- What methods are most successful
- Trade-offs and costs of those methods



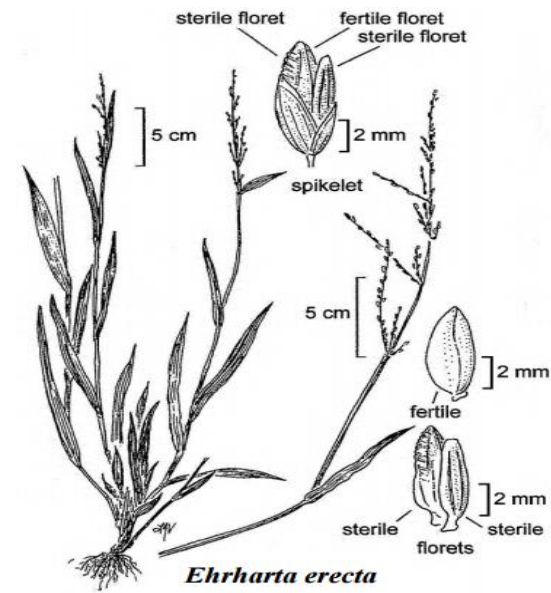
Chemical vs mechanical control

- Most common methods considered and employed
- Both can prove ineffective, exacerbate invasion, or incur additional environmental costs
- Herbicide applications
 - Legacy effects of management
 - Ecological concerns
- Mechanical control
 - Often disruptive to the soil and can damage the roots of non-target species



Ehrharta erecta

- Incipient invader
 - In California since 1930
- Moderate invader- Cal-IPC
- Invasive in: California, Hawaii, New Zealand, China, and across the Mediterranean
- Dispersal vegetative and via seeds
- Highly fecund

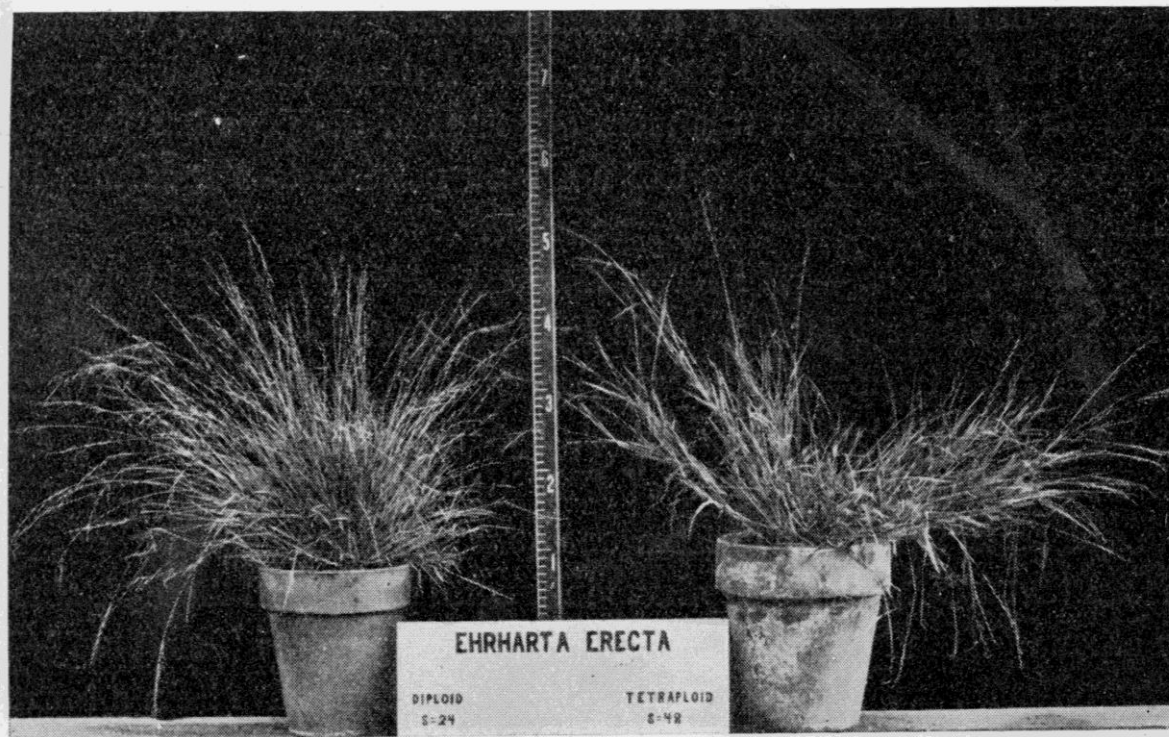


- Can invade a wide range of habitat types including
 - Sand dunes
 - Roadsides
 - Closed canopy forests
- Little known on its impacts or best management practices

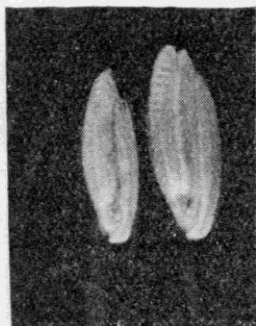




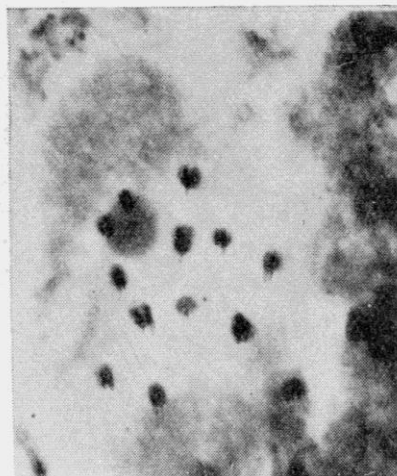
“Many plants (e.g., wheat, cotton, tobacco) evolved suddenly by a process involving the doubling of chromosomes. The same process is artificially induced to create useful new species”



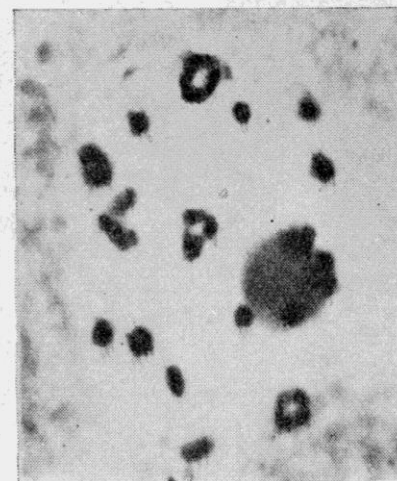
1



2



3



4



PLOT 7C

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PLOT 9B

SANTA CRUZ CAMPUS. EHRHARTA PLANTINGS.

No. 1. Planted December 16, 1964. On north end of campus, in redwoods by spring.

A. West facing slope, in deep leaf mold; with Asarum. Numbered from North to South.

B. Crest of ridge, 100 feet east of A. More open forest, with *Elymus glaucus*, *Galium californicum*, *Rubus ursinus*, etc.

No. 2. On hill above Empire Grade Road, just south of its crossing of creek in ravine.

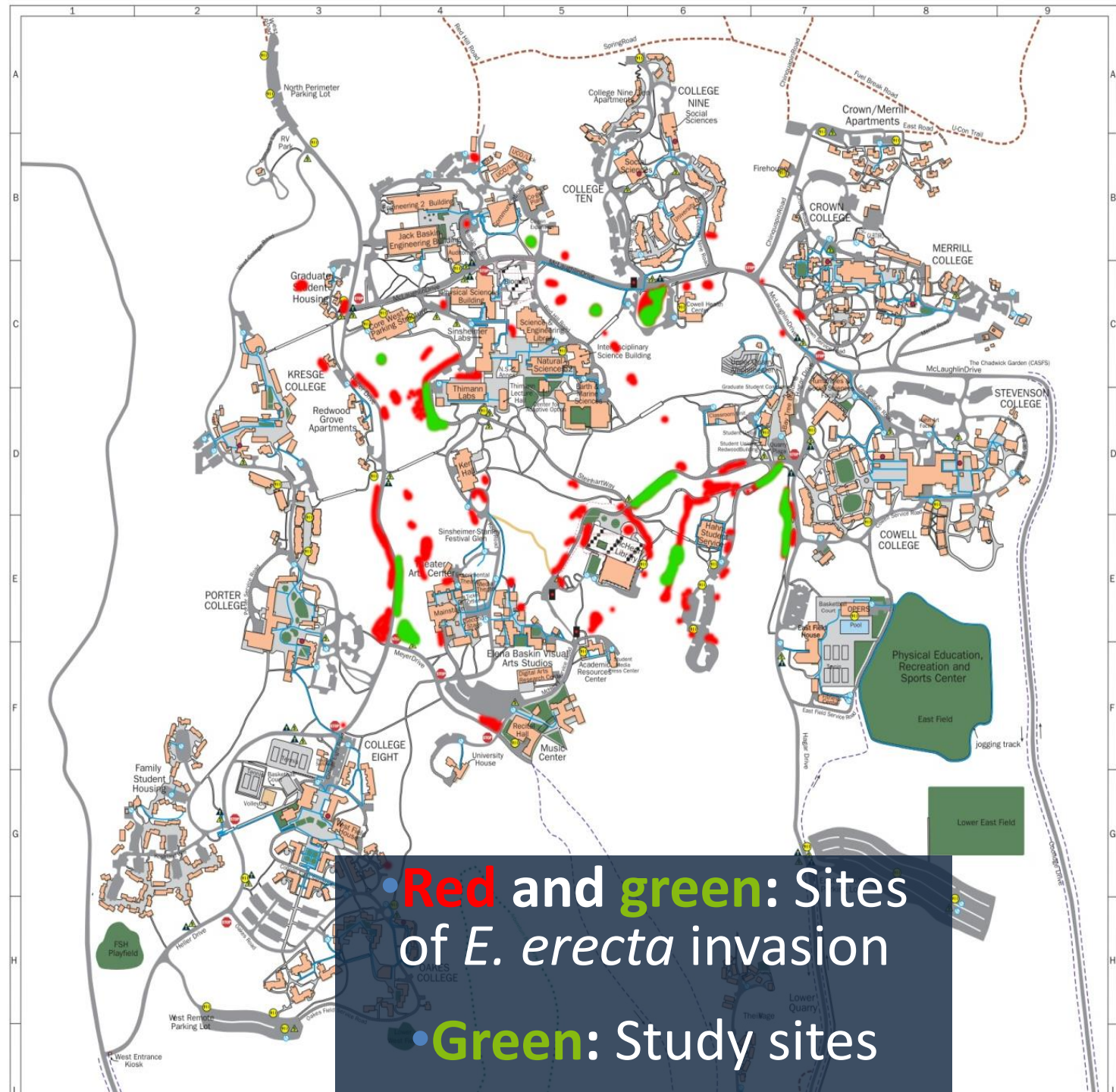
A. Crest of hill under *Umbellularia*. North end- just south of grassy embayment.
South end - below shallow grassy embayment.

B. Half way up the hill, under *Umbellularia* and *Sequoia*. North end at fence, south end below many-trunked *Sequoia*.

No. 3. At southwest corner of Campus, across field.

A. Must south of two large oaks. one almost dead, just below boundary fence. North stake 10' south of oak, just below fence.

B. North of A. just north of fence corner. nos. 1-15, ca. 20 ft. below fence, among *Umbellularias*. nos. 16-30: 30 ft. below 1-15, just south of large oak.



Research Questions:

What are the invasion impacts of *E. erecta*?

Is chemical or mechanical control more effective at managing *E. erecta*?

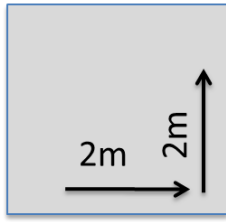
What are the non-target impacts of those control methods?



The impacts of *E. erecta* invasion on native species richness and cover

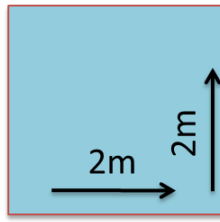


Mechanical vs Chemical Control: target and non-target effects

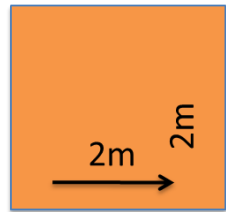


Control

- Plots un-manipulated
- 1st surveyed May-June 2013

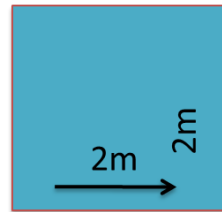


Reference



Herbicide

- Dec 12. sprayed with ~2.5% glyphosate + water solution
- Jan 13 sprayed with 3-4% glyphosate + water solution



Pull

- 1st treatment Dec 12. All *E. erecta* hand-pulled
- Jan-Feb 13 new growth pulled

- 44 Sites
- 33 4m² treatment plots
 - Herbicide
 - Hand pull
 - Control
- Subset of each plot sampled, point-intercept method
 - % All species

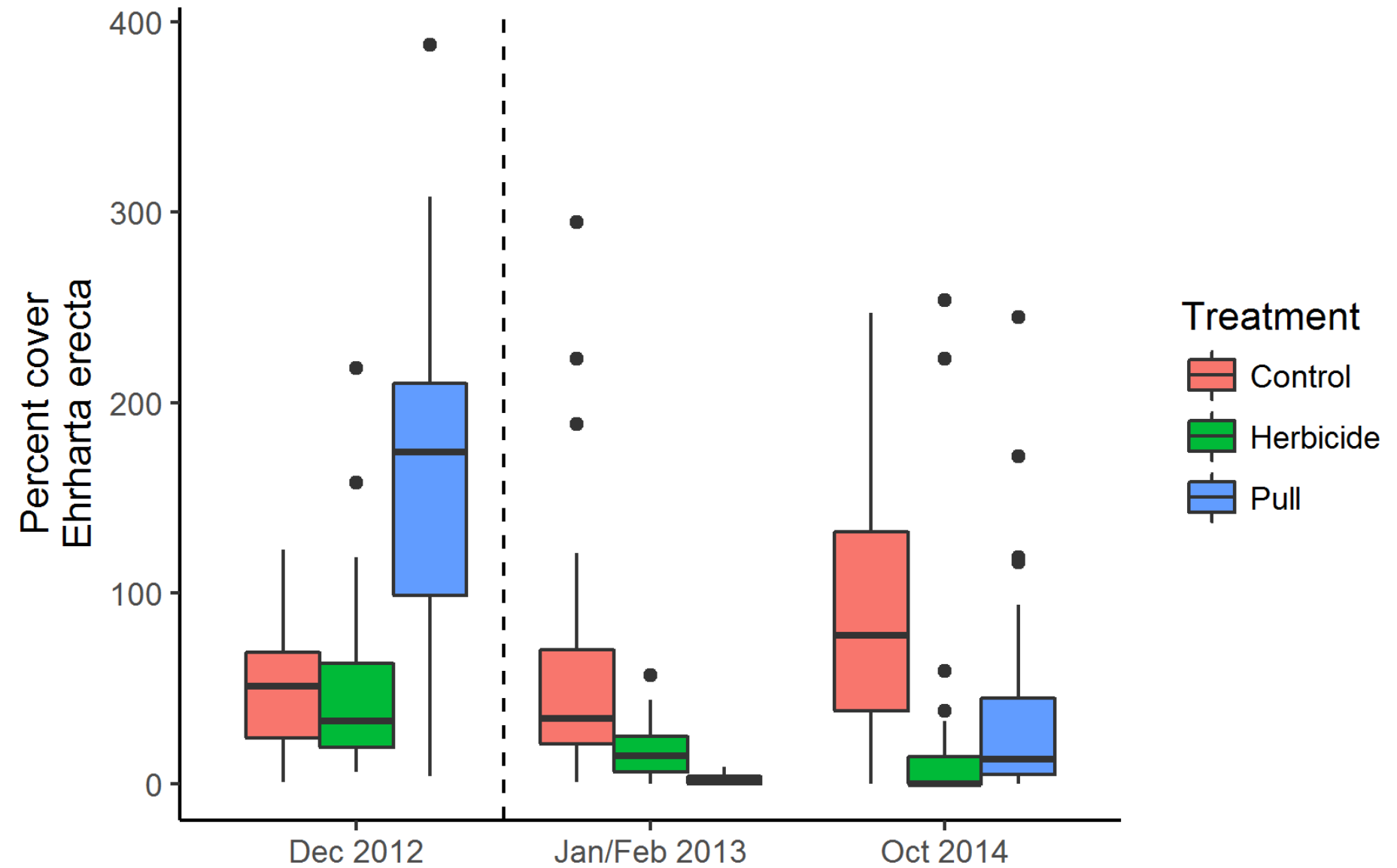
Predictions

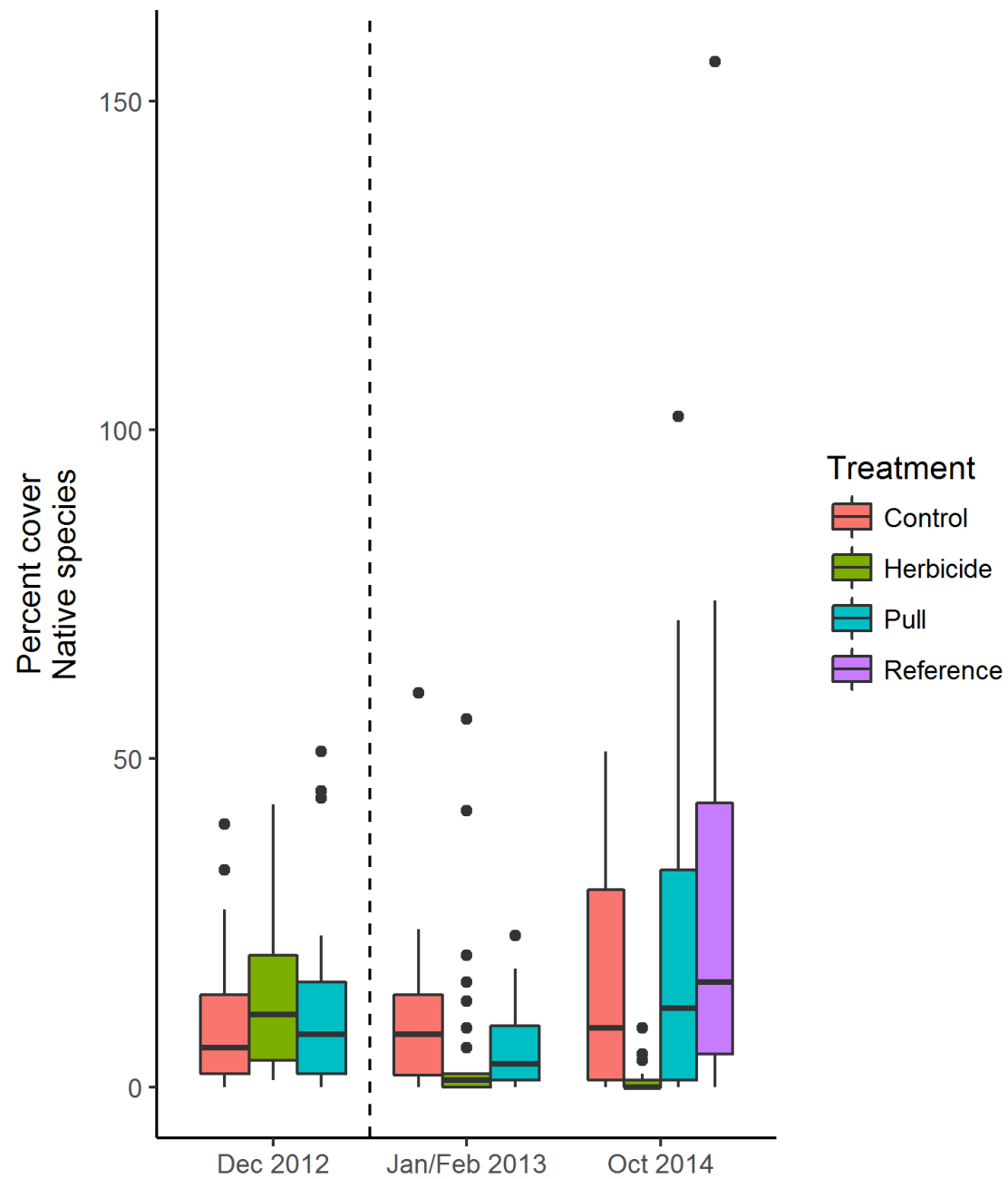
Is chemical or mechanical control more effective at managing *E. erecta*?

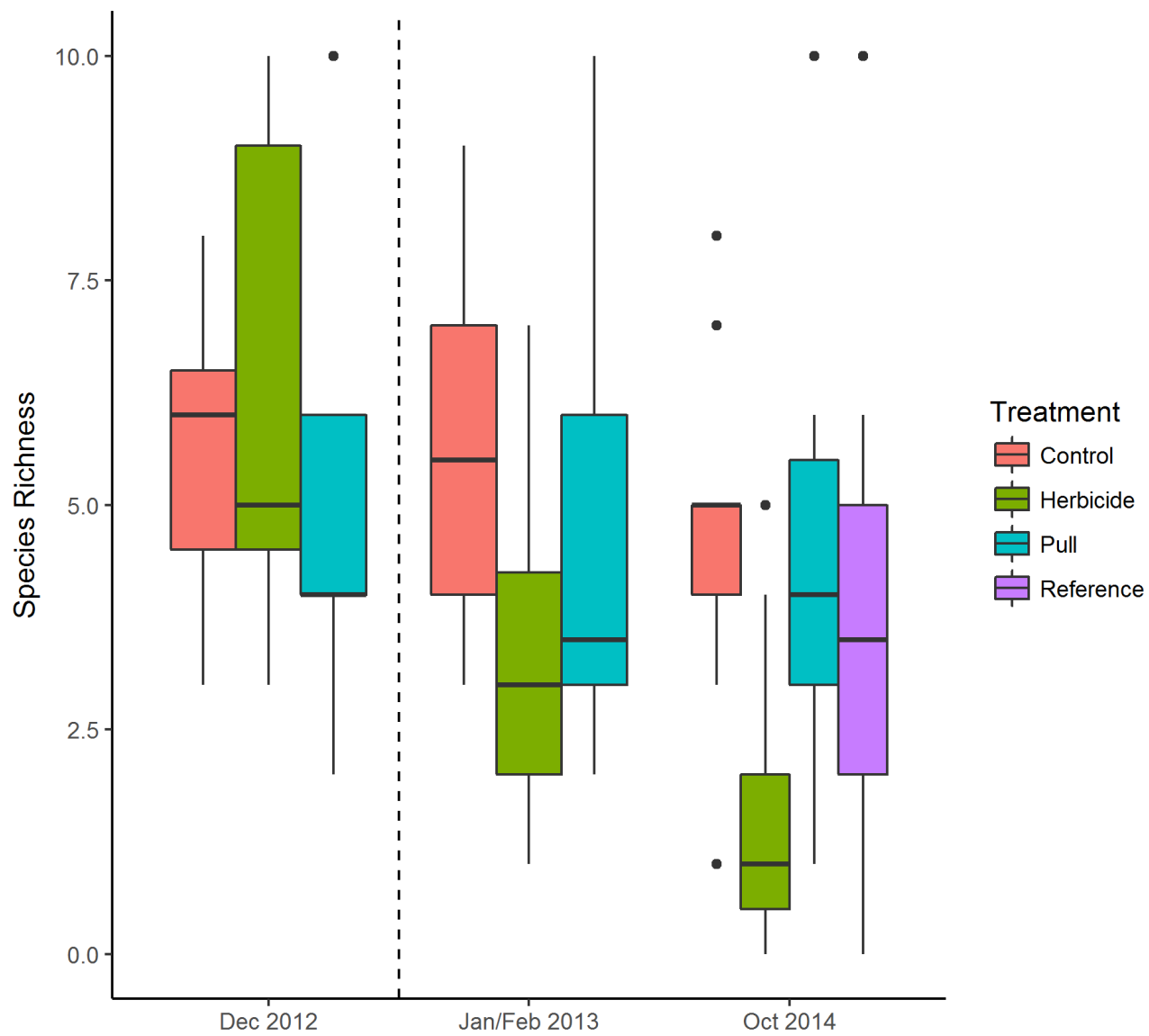
- Herbicide application most effective
 - Less soil disturbance

What are the non-target impacts of those control methods?

- Lower native species richness and cover in the herbicide treated plots







Questions?





