UNIVERSITY OF NEVADA LAS VEGAS

The Good with the Bad: when Ecological Restoration Facilitates Non-Native Plants

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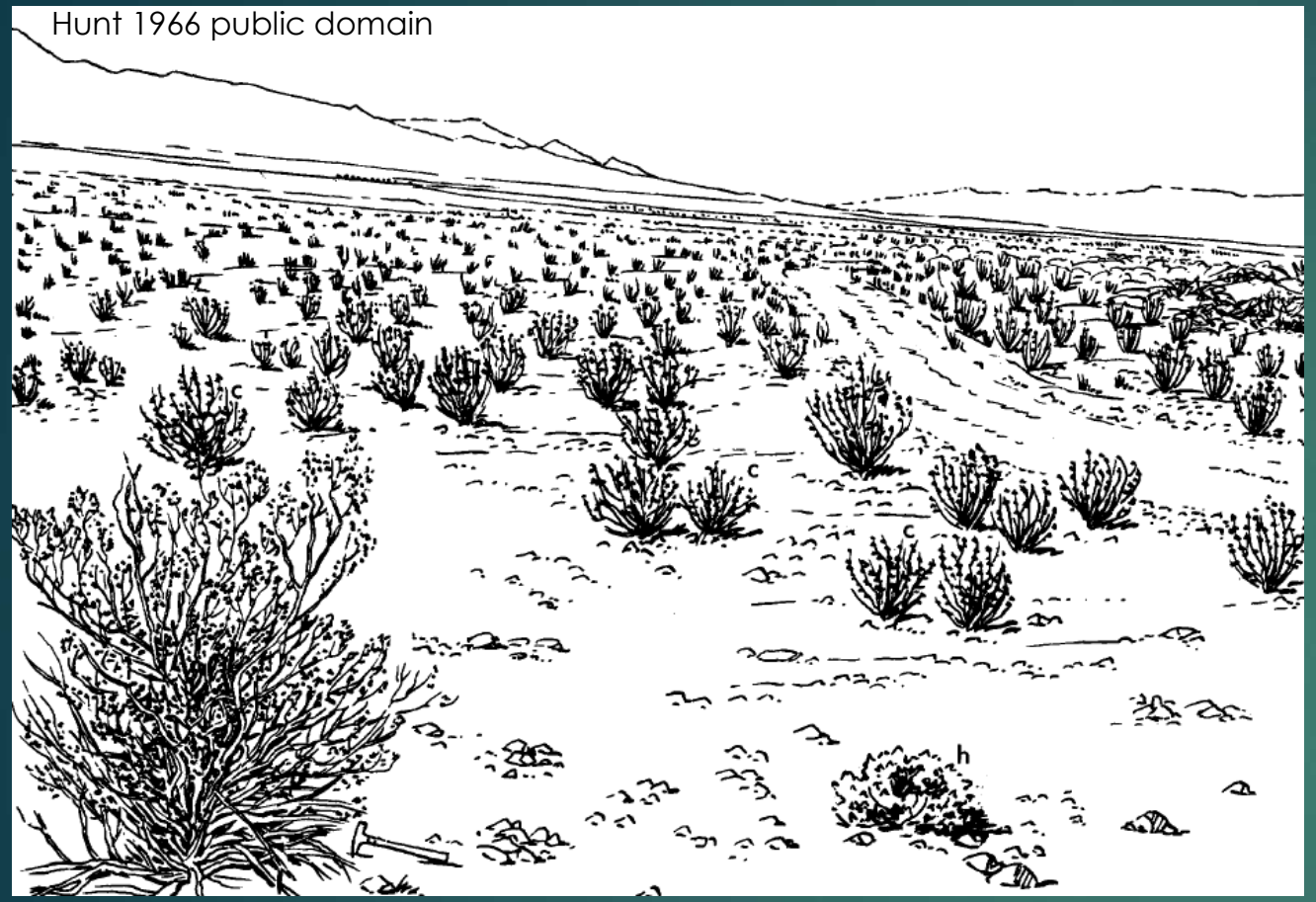
Fertile Islands Underpin Desert Restoration



– Microsites below many perennials (often shrubs)
– Enriched nutrients, shaded, seed deposition
– Restore for structure and function

J Arid Land (2013) 5(3): 298–309
doi: 10.1007/s40333-013-0172-0
jal.xjegi.com; www.springer.com/40333

Annual-perennial plant relationships and species selection for desert restoration

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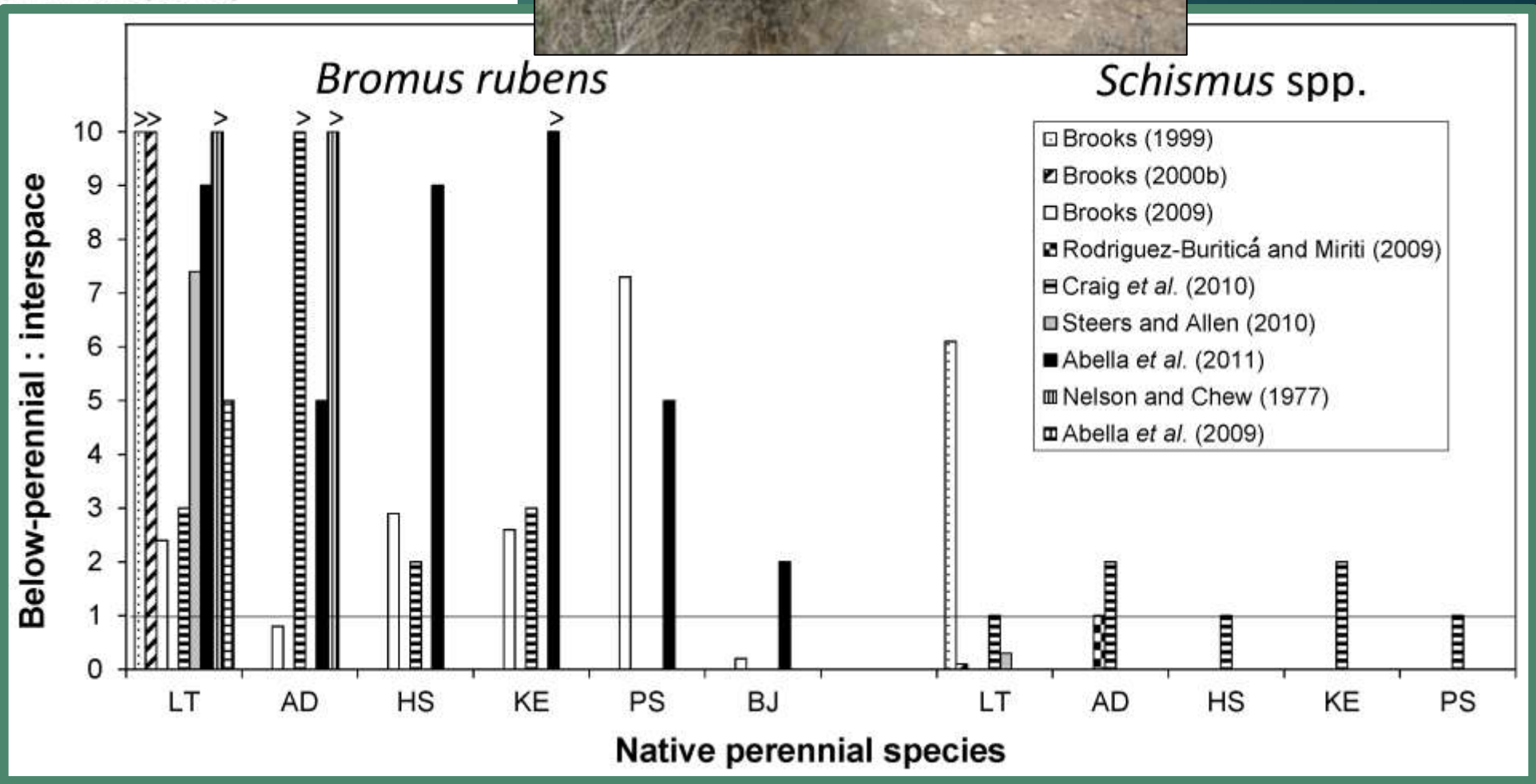
Abstract: Exotic plant invasion is a growing concern i
ecosystems. By creating areas of ameliorated microcli
might influence exotic annual plant invasions. We con
pared exotic annual plant abundance among native per
in North America's Mojave Desert, where exotic plant i
and broad-scale ecosystem transformation. Ten studie

Are these patterns similar during restoration?



Joshua Tree National Park

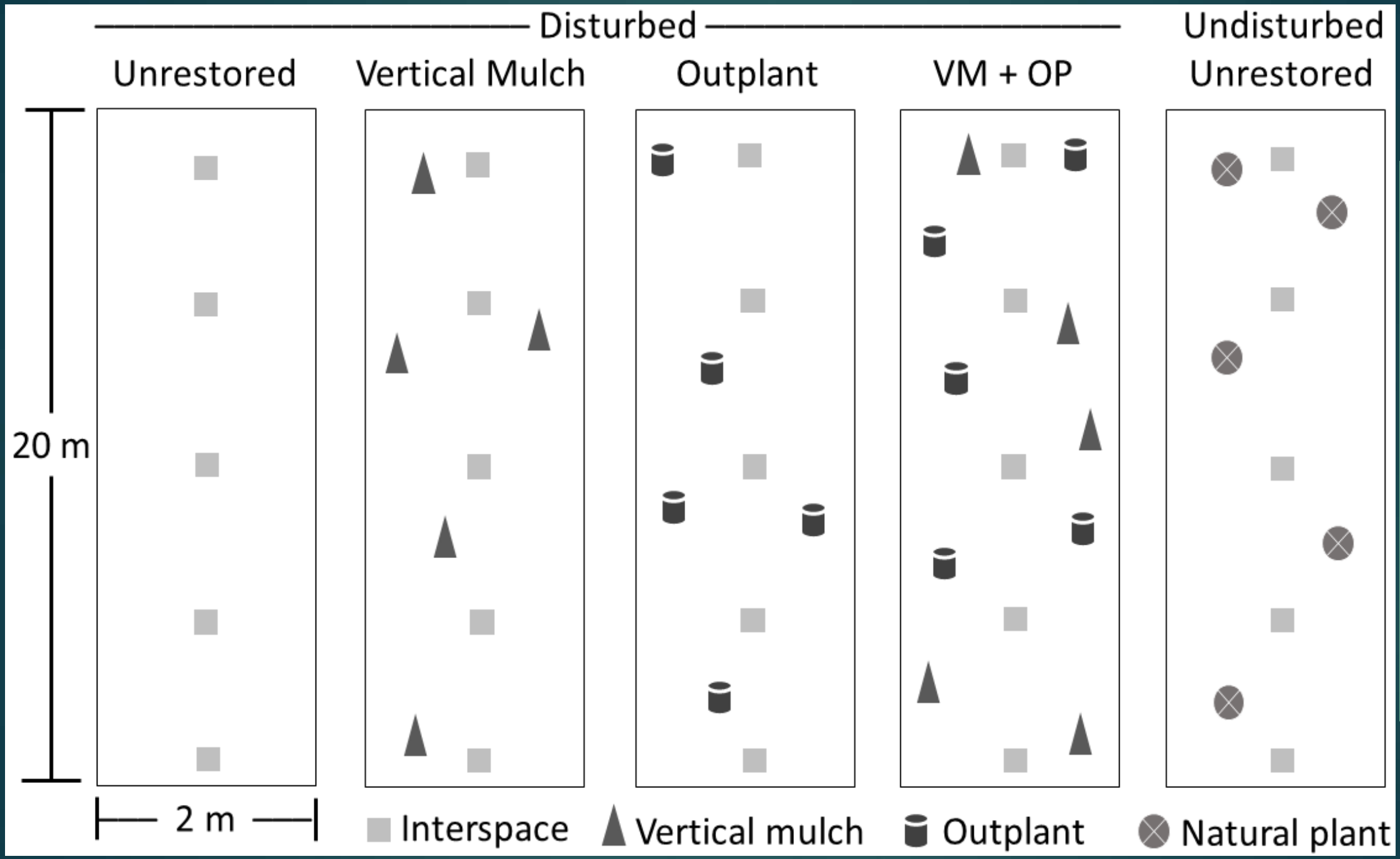
Red brome

Cheatgrass

Schismus spp.

Keys View Road Study Area

- 6-mile disturbance corridor, Federal Highways
- Outplanting, vertical mulch in March 2008
- Outplants caged, hand watered
- 5 whole-plot treatments
- Nested outplant, vertical mulch, interspace



6 each

2009

2010

2011

2017

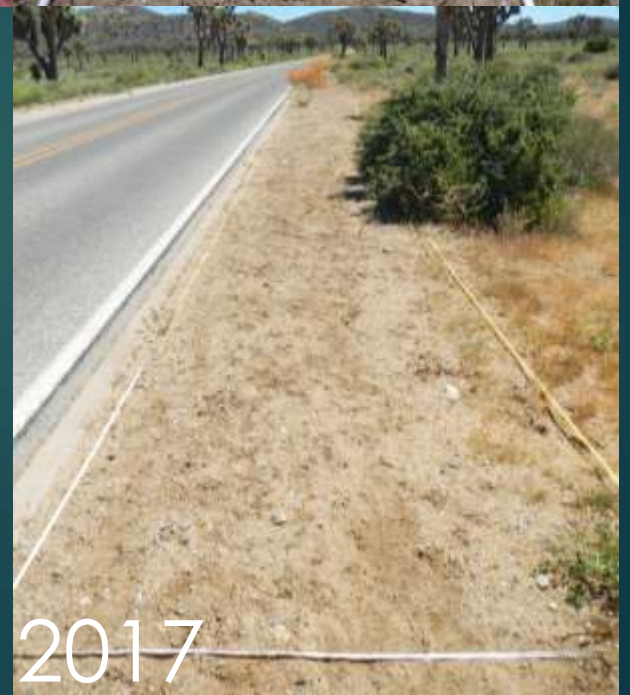

2008


2010


2011


2017


2017

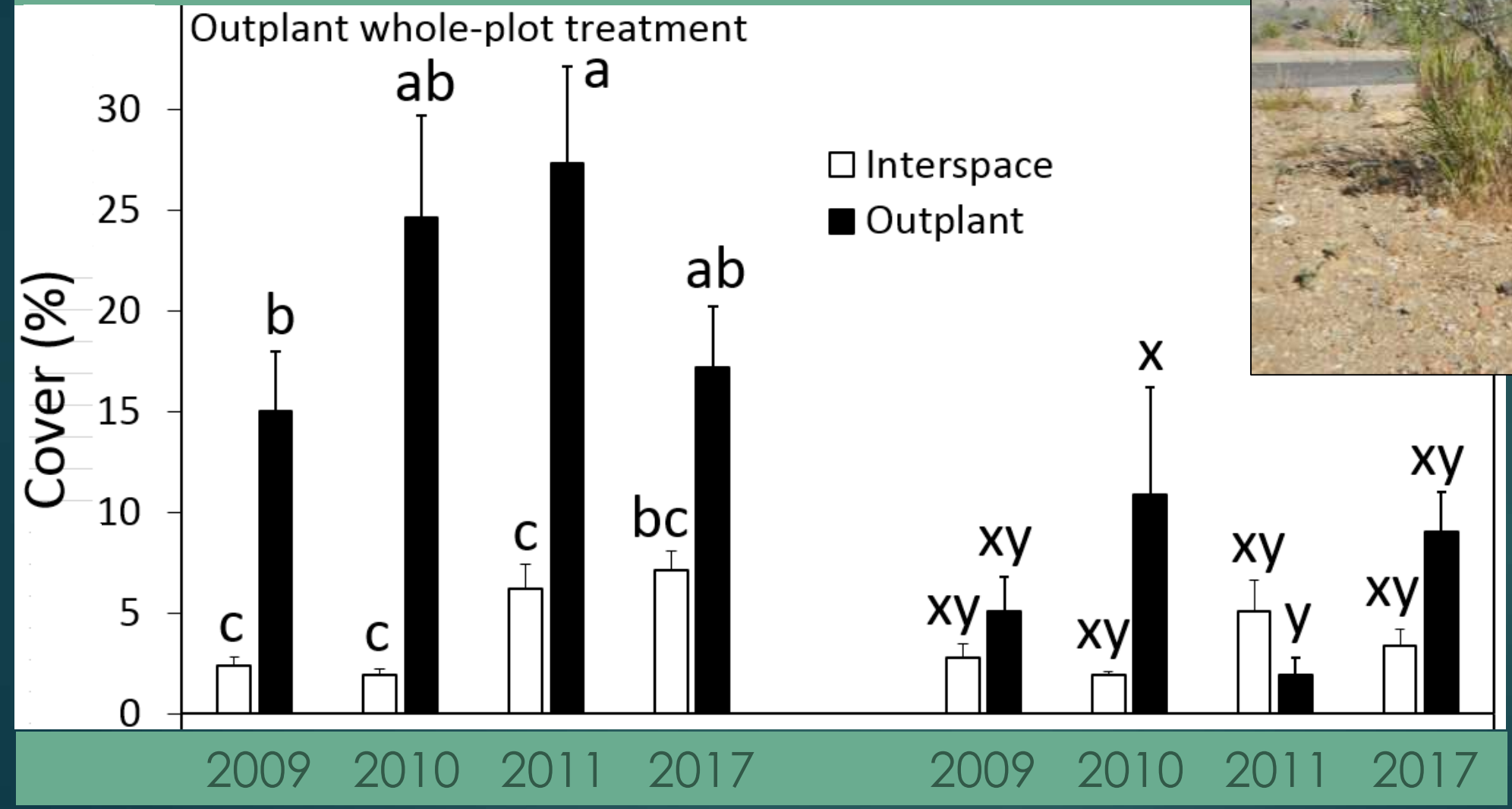


Ambient “undisturbed”

Microsite Scale – annual-biennial species

Non-native

Native

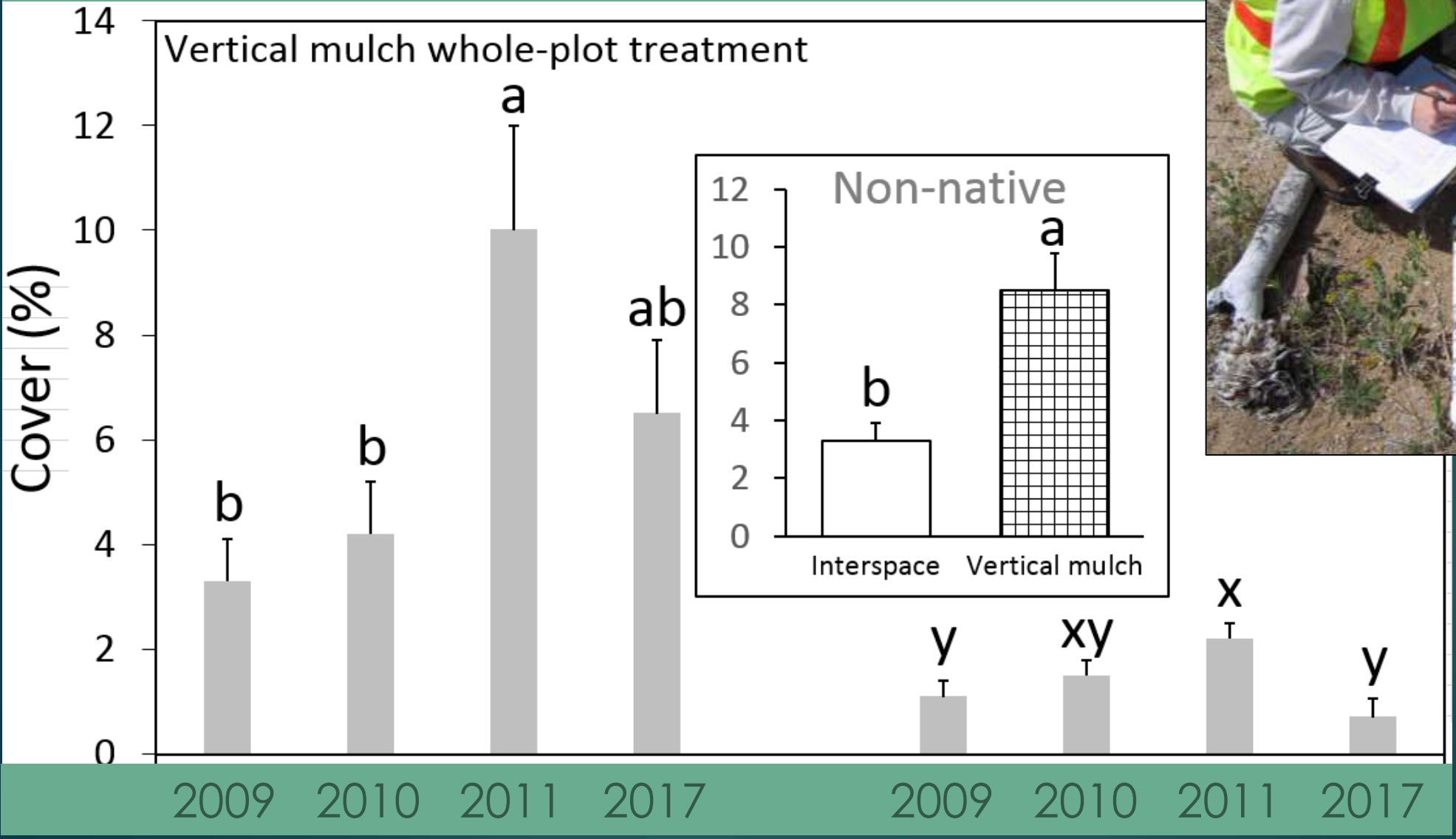


Outplant

Microsite Scale – annual-biennial species

Non-native

Native

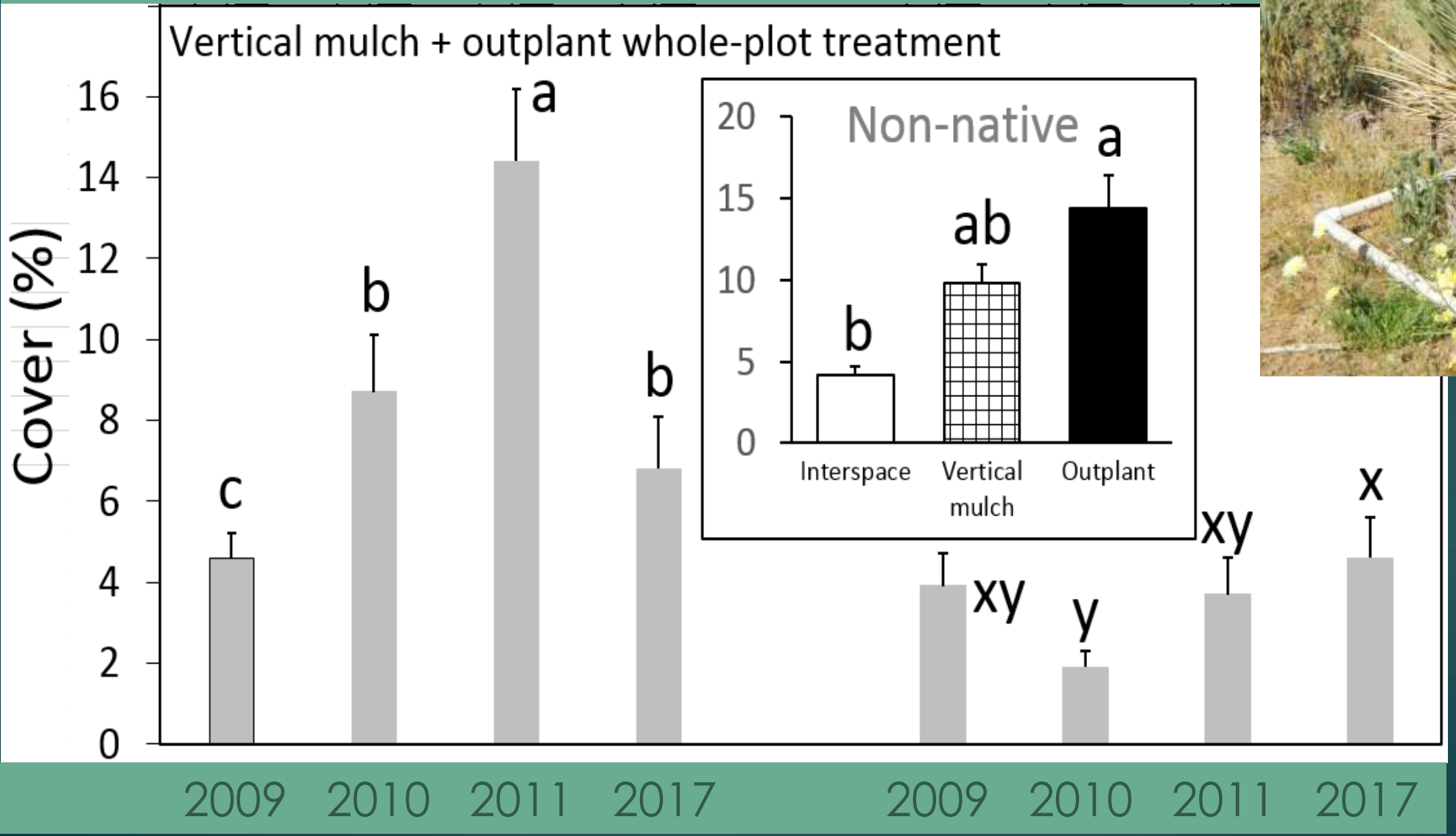


Vertical mulch

Microsite Scale – annual-biennial species

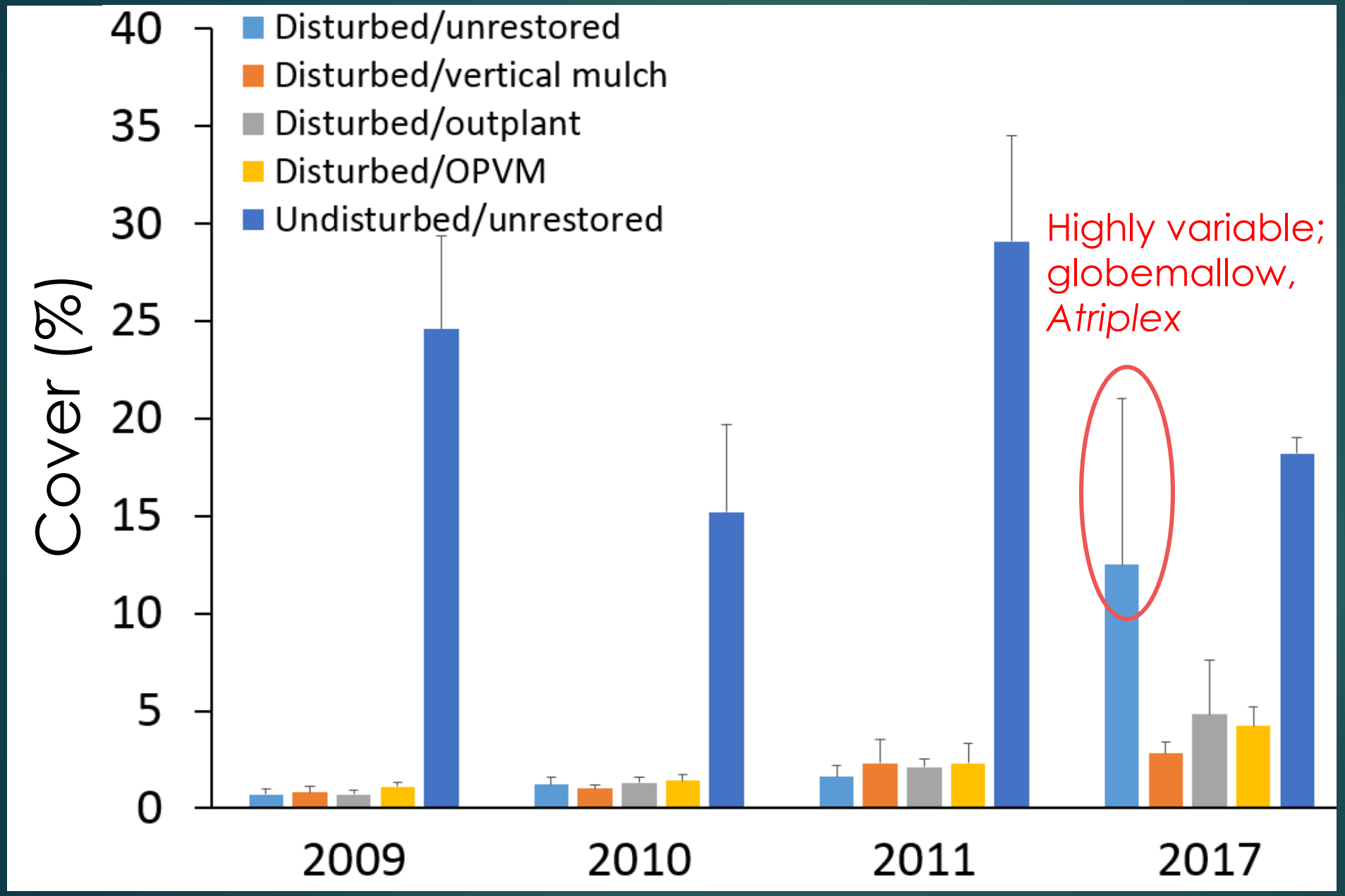
Non-native

Native

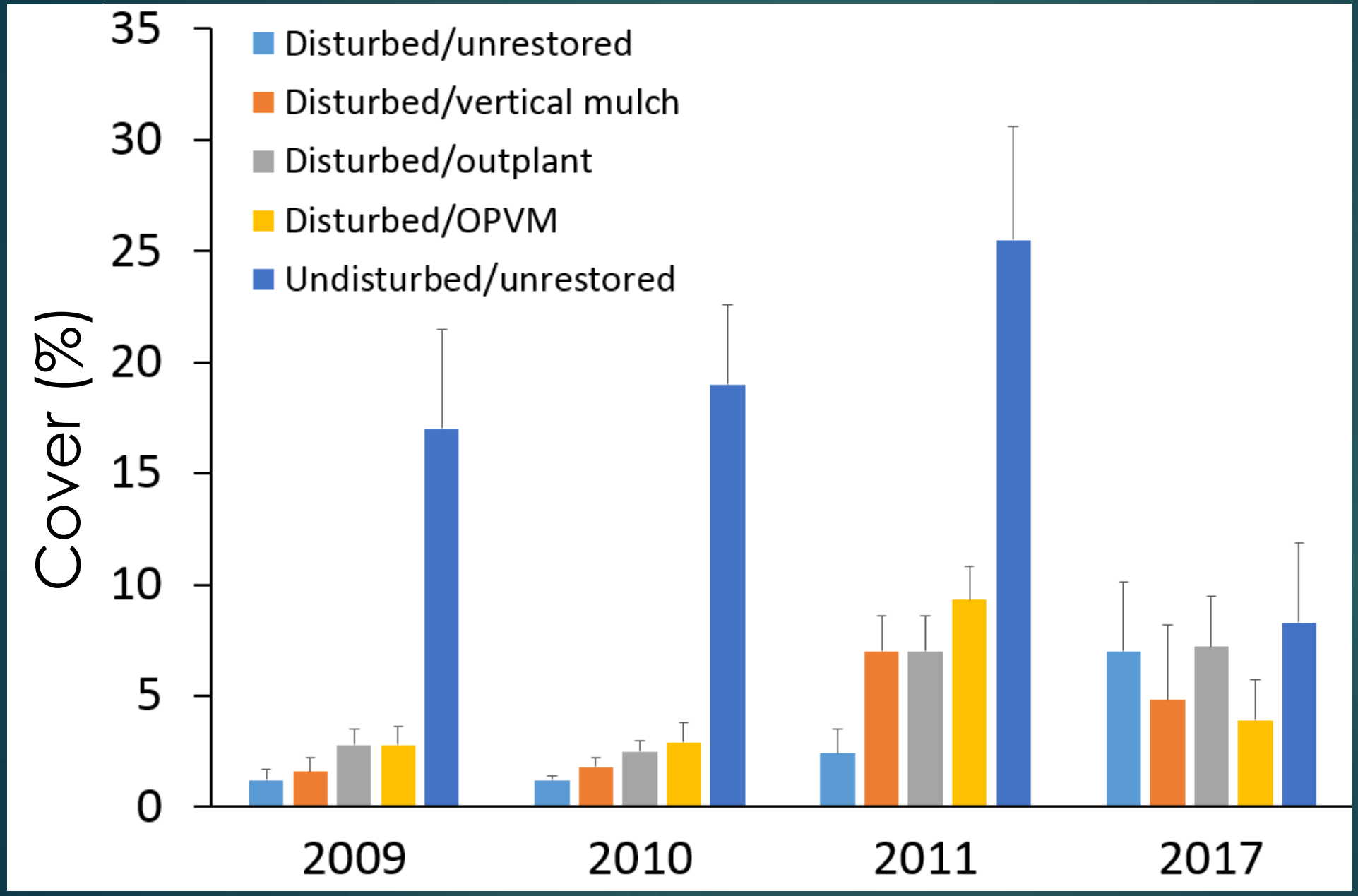


Outplant + vertical mulch

Whole-Plot Treatment Scale – native perennials



Whole-Plot Treatment Scale – non-native annuals-biennials



– Native annuals no significant patterns, not shown

Discussion and Conclusions

– Lower-elevation Twentynine Palms, CA weather station reported 1936-2016 avg of 4.3 inches/yr rain
– All 9 study years (incl 2017 trends) below average
– Lacking winter rains or if have, shut off in late winter as in 2017

– Difficult restoration setting – chronic disturbance, non-native plants coupled with the usual challenges of weather, herbivory, etc.
– Outplanting treatment includes cage, watering, greenhouse soil
– Native annuals were mercurial – run correlation analysis, species
– Are fertile islands less important in wet years?
– Weed control paired with native plant restoration?





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Web: Book Site, UNLV, Applied Ecology, Youtube

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