

Effects of mowing at varying propagule pressures on competition between native and non-native annual species

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Mowing & Thatch Removal



- Common and cost-effective technique
- Reduces invasive grass abundance and increases success of native forbs

- Leaving thatch is counter productive
 - Prohibits growth of new plants
 - Phenology & functional traits



Propagule Pressure

- High propagule pressure = competitive advantage
- To compete and get established, native species need high seed abundance
- Important to restoration

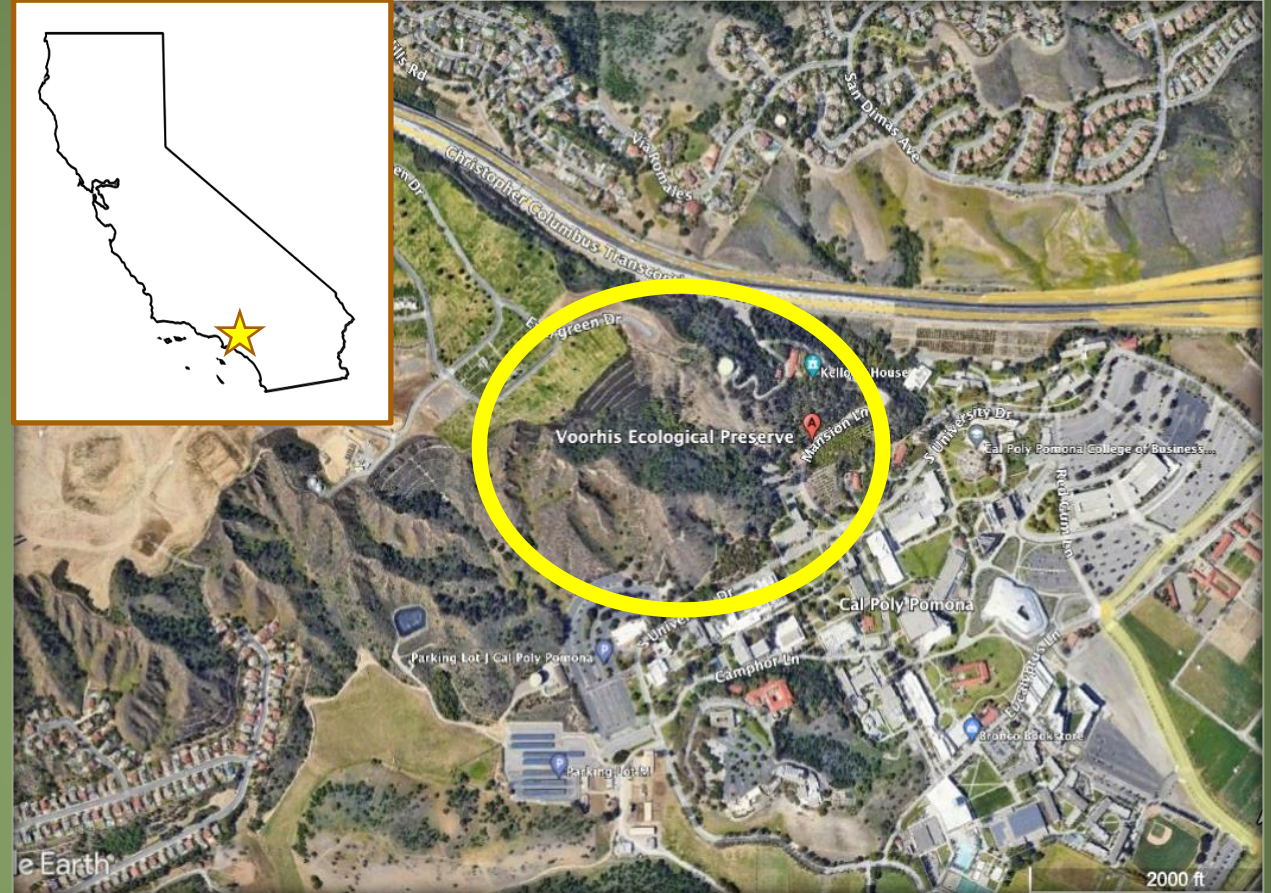


Objectives

- Examine the interaction between a mowing and thatch removal treatment at varying native propagule pressures.
- Assess the impact these treatments have on invasive species cover.

Study Site

- Voorhis Ecological Reserve
- Invaded habitat
 - cattle grazing
 - fire
- Common Invasive Species
 - *Bromus diandrus*
 - *Centaurea melitensis*
 - *Hirschfeldia incana*



Design



Mowed Blocks

Block 5

Block 4

Block 1

Block 6

Block 3

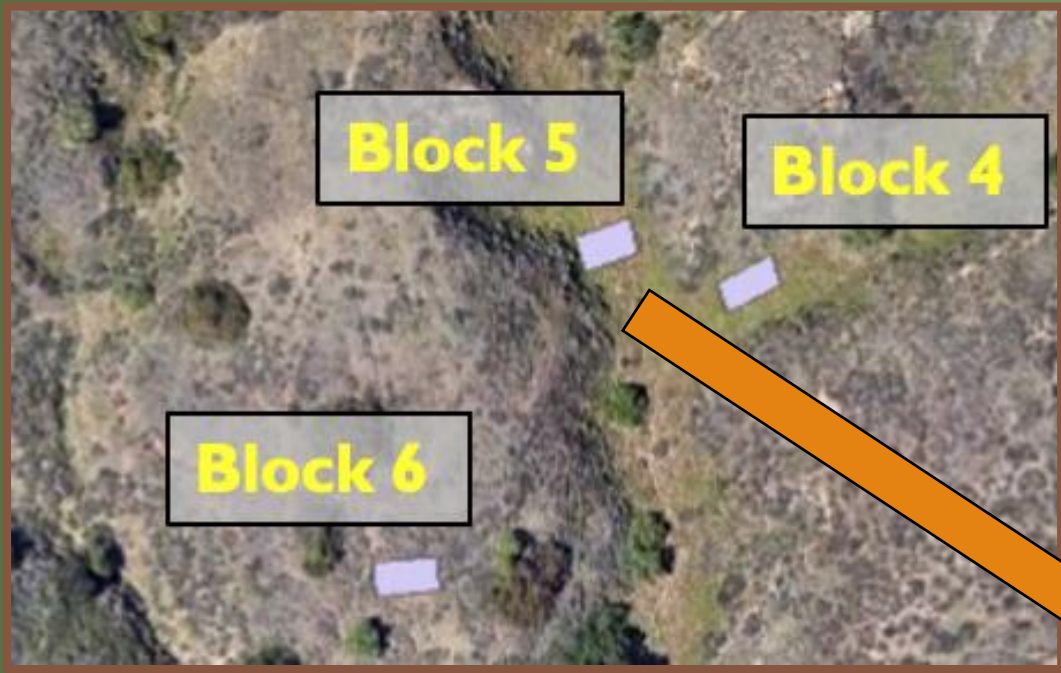
Block 2

Block 8

Block 7







1.5m x 1.5m

Invasive Control 0 Seeds	P3 6,016 Seeds
P1 500 Seeds	P4 10,352 Seeds
P2 1,680 Seeds	P5 40,000 Seeds

Methods

- Eleven locally native annual species seeded:

Scientific Name
<i>Amsinckia intermedia</i>
<i>Calandrinia ciliata</i>
<i>Castilleja exserta</i>
<i>Clarkia purpurea</i>
<i>Cryptantha intermedia</i>
<i>Deinandra fasciculata</i>
<i>Festuca microstachys</i>
<i>Muhlenbergia microsperma</i>
<i>Phacelia minor</i>
<i>Plantago erecta</i>
<i>Pseudognaphalium californicum</i>

Amsinckia intermedia



Clarkia purpurea



Phacelia minor



Pseudognaphalium californicum



Methods

- Eleven locally native annual species seeded:
 - Found in many common plant communities
 - Majority of biodiversity
 - Functionally similar to invasive species
 - Create thatch

Phacelia minor



Amsinckia intermedia



Pseudognaphalium californicum

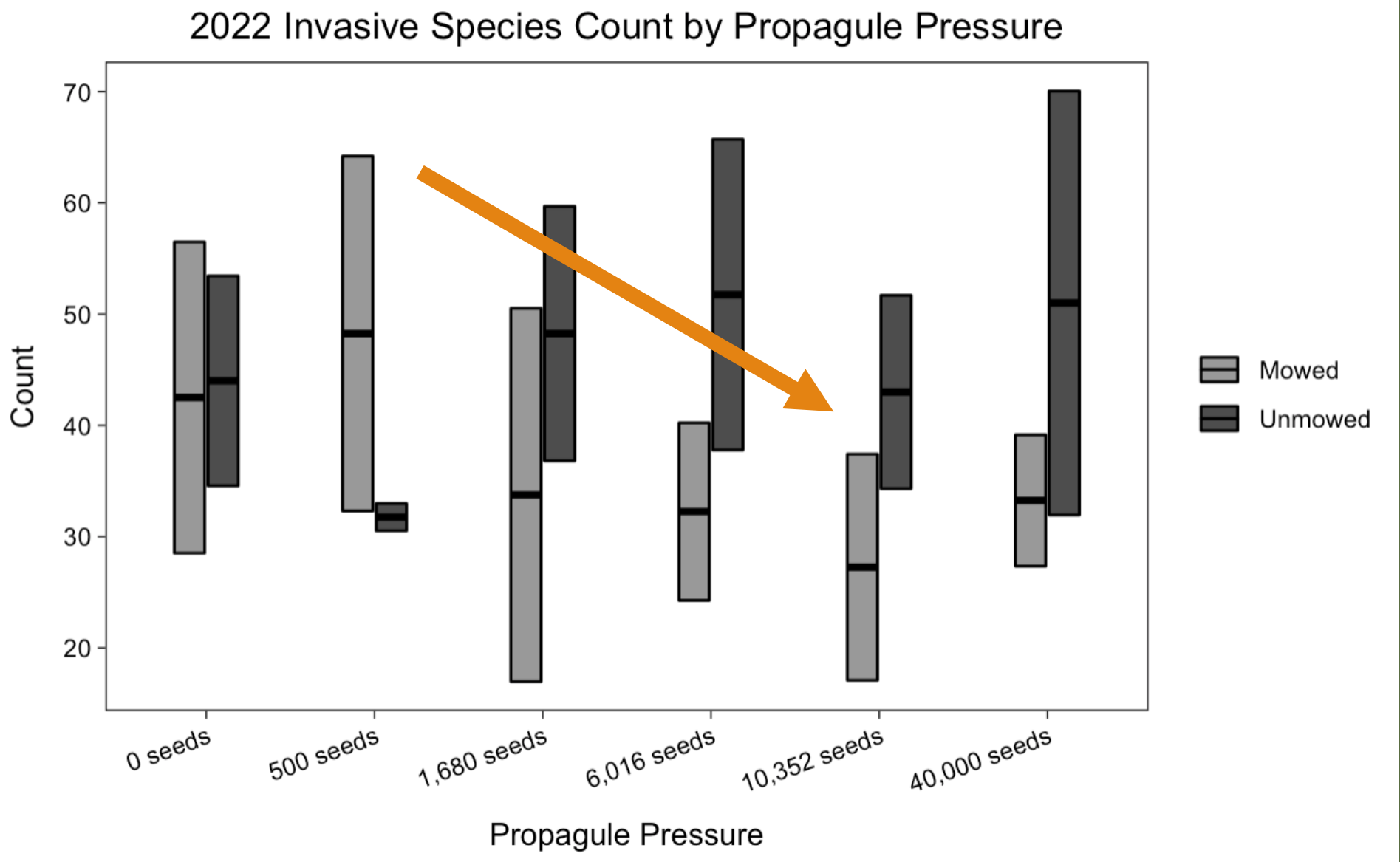


Clarkia purpurea



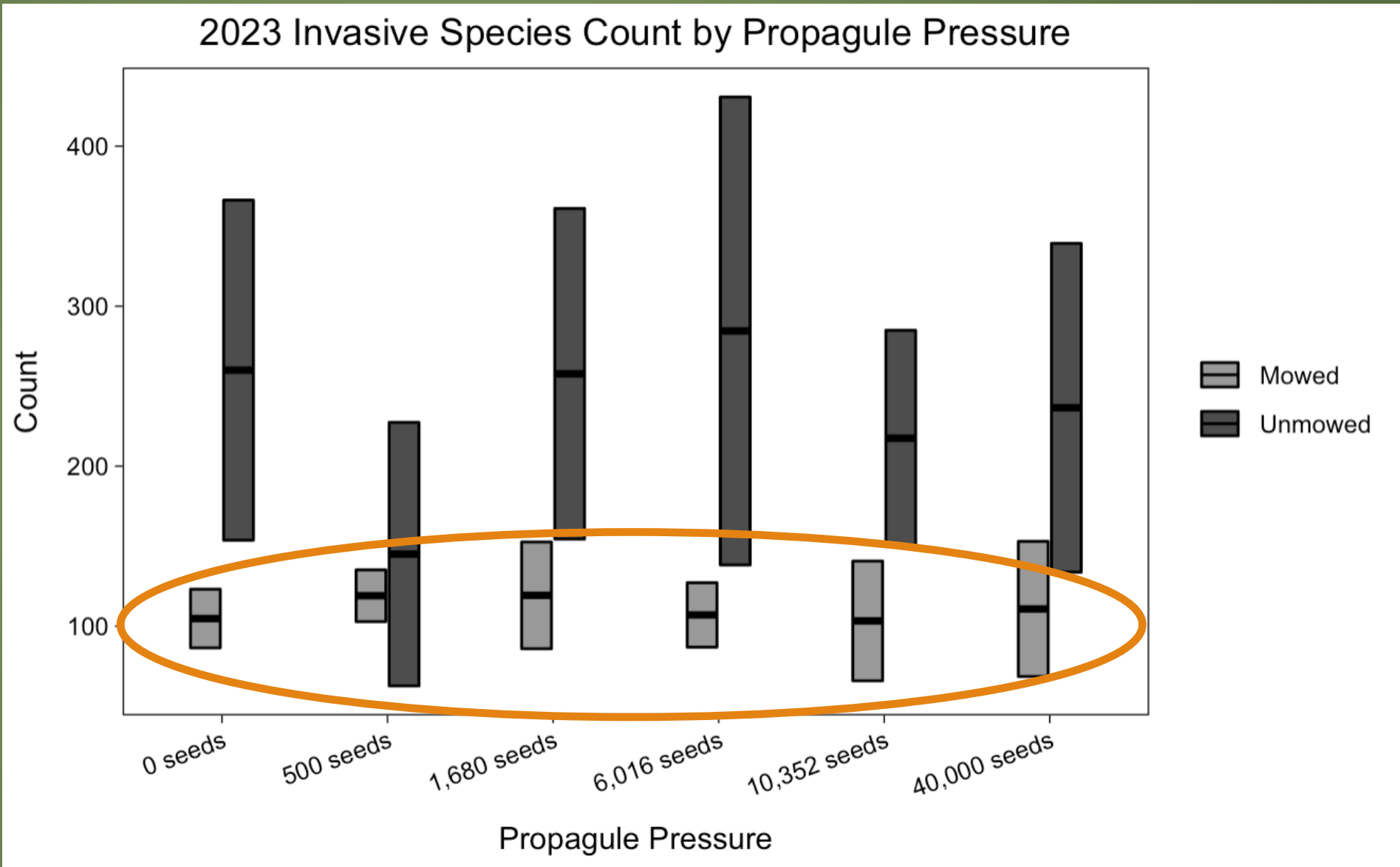
2022

Mowing	NS
Propagule Pressure	NS
Mowing x Propagule Pressure	P<0.05



2023

Mowing	P<0.05
Propagule Pressure	NS
Mowing x Propagule Pressure	NS



In conclusion...

- Employing a mowing technique with thatch removal **lowers** invasive species cover.
- The best way to reduce invasive species cover is to use a mowing and thatch removal technique **and** broadcast native seed.
- Important cost-effective technique for highly invaded sites.



Acknowledgments

Thank you to:

My Thesis Committee: Dr. Erin Questad, Dr. Janel Ortiz, Dr. Amanda Swanson

Dr. Ehren Moler, Mark Mazhnyy, Taylor Edwards, Meghan Jeffus, Noah Szczeszinski, Amanda Jennings, Amaris Bellord, Maddison Mejia, Kimberly Silva, Anthony Rondon, Ashley Bartling, Jaclyn Fritz, Chelsea Hoban, and Alyssa Goldpenny

CPP Biology Graduate Research Funds



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