# Post-fire Seed Predation in a Mixed Conifer Forest


Victoria Mattsson

UC Davis | Environmental Science & Management major

*Advised by members of the FOCAL and Latimer Labs*

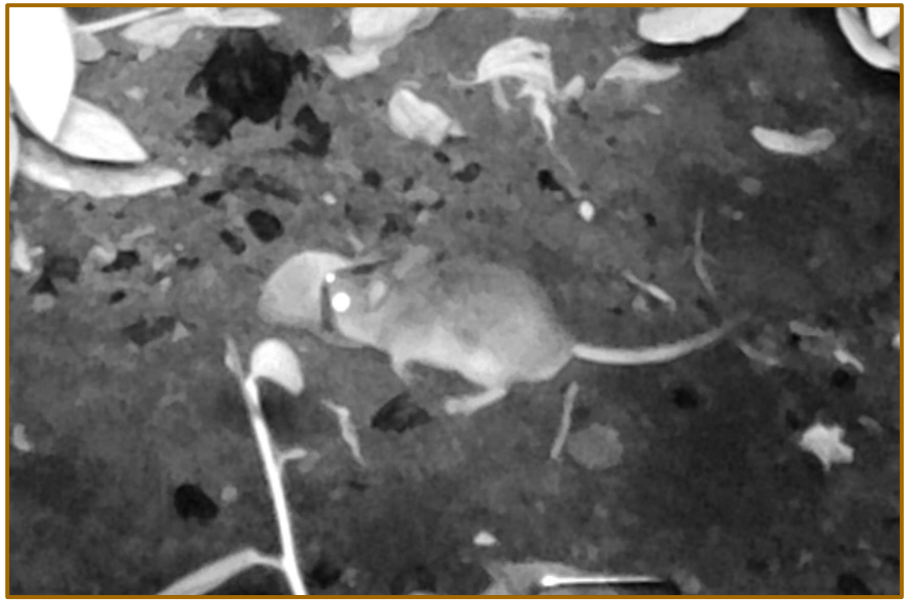
vemattsson@ucdavis.edu

# Changing Fire Regimes and Low Seedling Recruitment

Fire exclusion has resulted in

- Dense forests with increasing proportions of shade-tolerant tree species
- Increasing high-severity fire events
- Vast burn scars with below-replacement sparse conifer seedling recruitment

One understudied mediator of forest recovery… **seed predation**



My guiding questions

- Could seed predation contribute to low seedling densities in these new fire regimes?
- Does its effect vary spatially?
- Could conifers experience species-specific differences in predation pressure?

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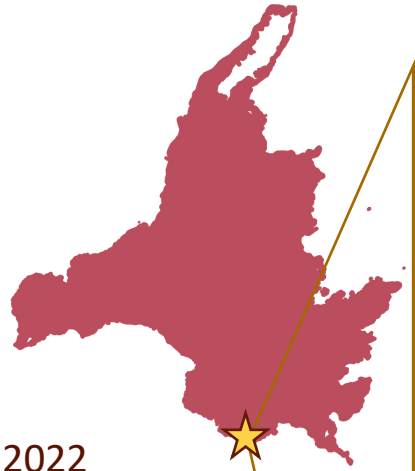
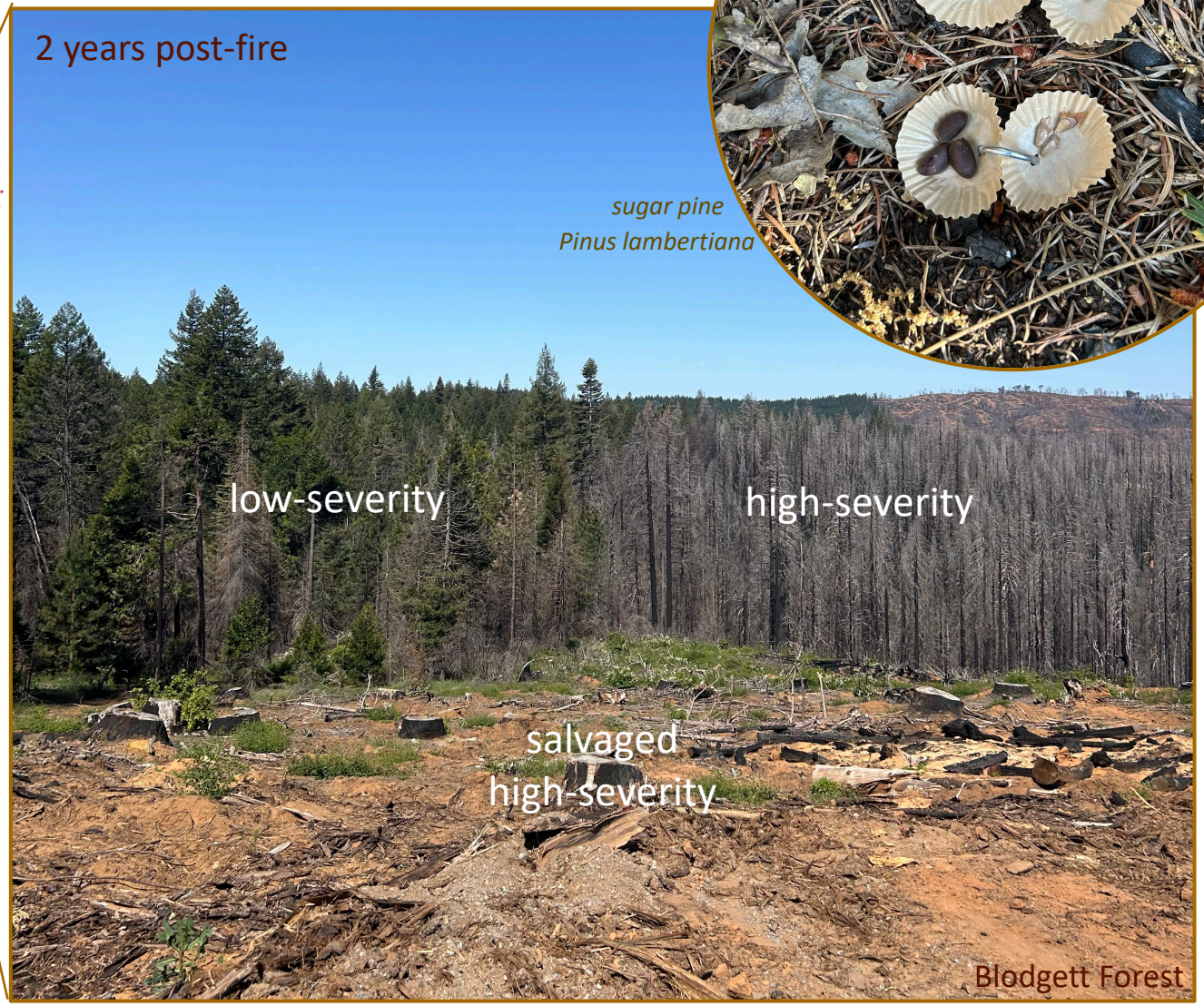
# Seed Predation Experiment



2022 Mosquito Fire, Eldorado and Tahoe National Forests





- 720 experimental seeds placed in 5 different postfire conditions:
  - Low-severity (control)
  - High-severity, 50m from surviving trees
  - High-severity, 250m
  - Salvaged high-severity, 50m
  - Salvaged high-severity, 250m
- Placed seeds in trays, counting # remaining on day 1, 2, and 7
- Multiple areas tested for five weeks during cone ripening season

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# Results

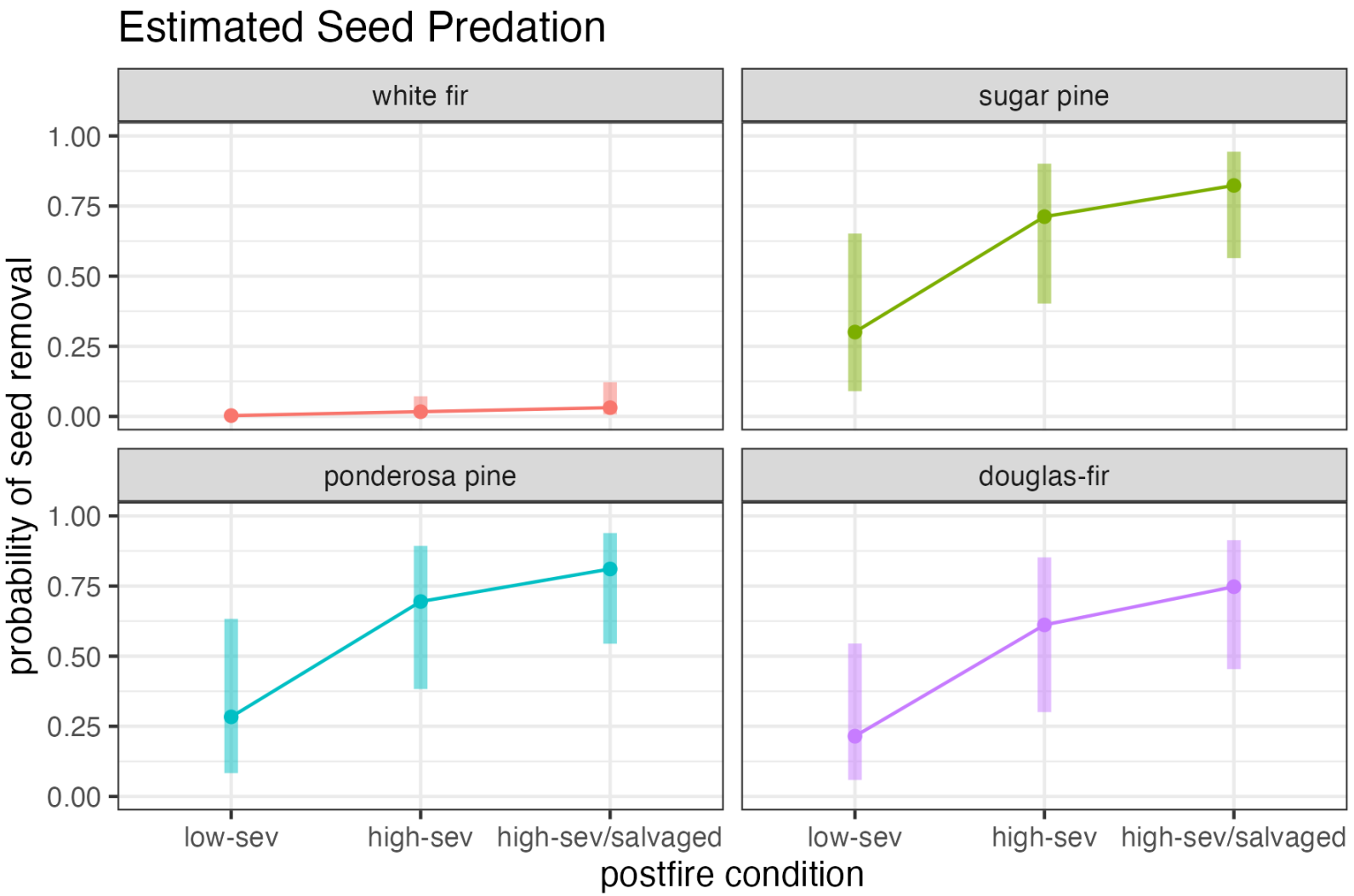


Fig 1. Predicted probability a seed is predated for four common mixed-conifer species across different postfire environments. Based on a binomial generalized linear mixed model.

## Pines & Douglas-Fir Seeds

- Significantly higher seed predation in high-severity conditions than low-severity
- Slightly greater predation in salvaged compared to unsalvaged conditions

## White Fir Seeds

- Low seed predation across conditions
- Much lower predation than other species
- May indicate a foraging preference against white fir

Difference in predation of pines and douglas-fir vs. white fir is **exaggerated** in high-severity areas.

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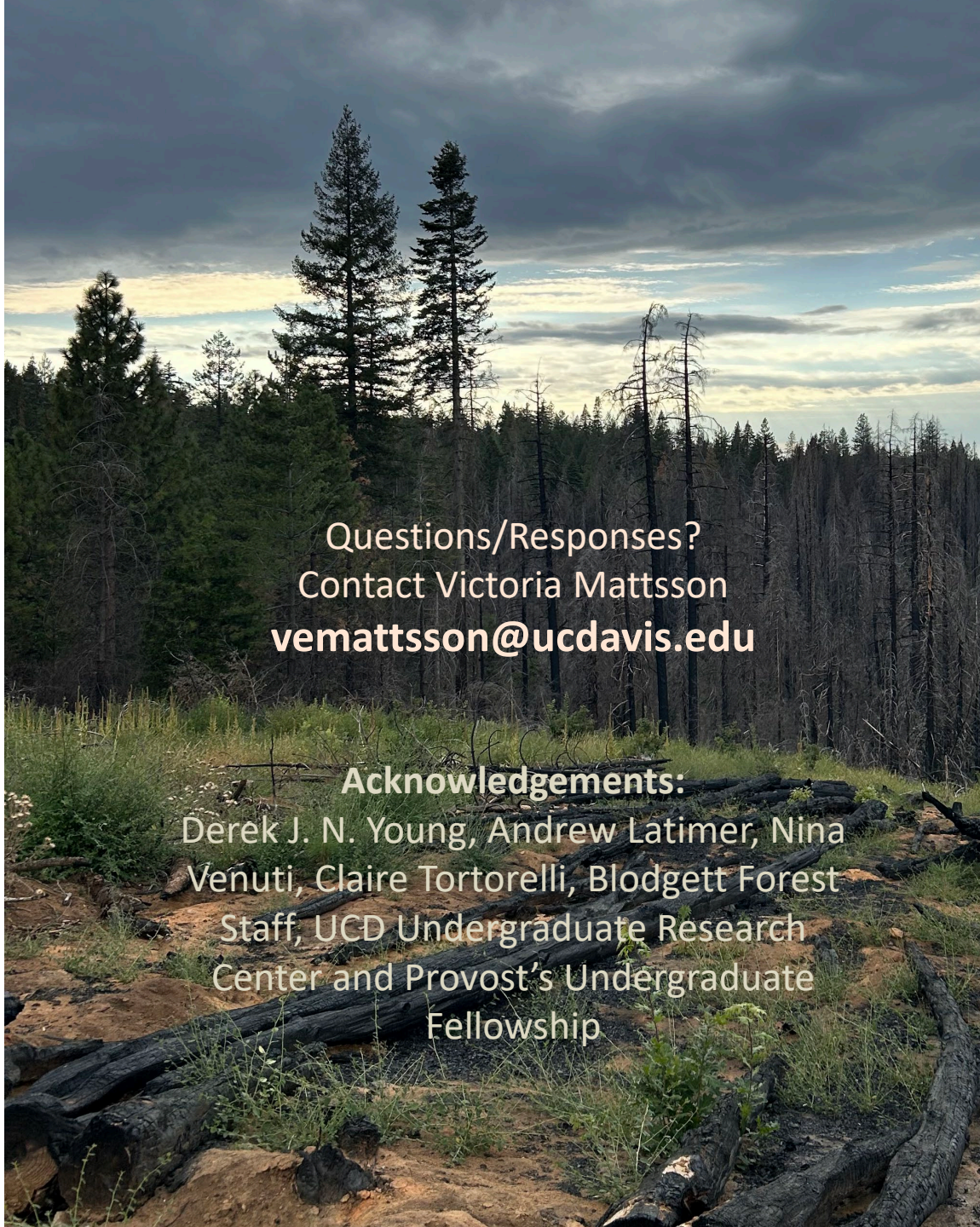
# Implications

Seed predation may…

- act as a critical barrier to recovery in especially seed-limited post-fire landscapes,
- compound with white fir seed dispersal and production capabilities to shift mixed conifer forest compositions, and
- contribute to the maintenance of alternate stable states through additional disturbance

Additionally, this supports that low-severity fire as a restoration tool can limit white fir advantage.

In summary… **seed predation matters**!



Questions/Responses?
Contact Victoria Mattsson
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