Item 13B 7/12/2022

Bark Beetles and Conifer Mortality

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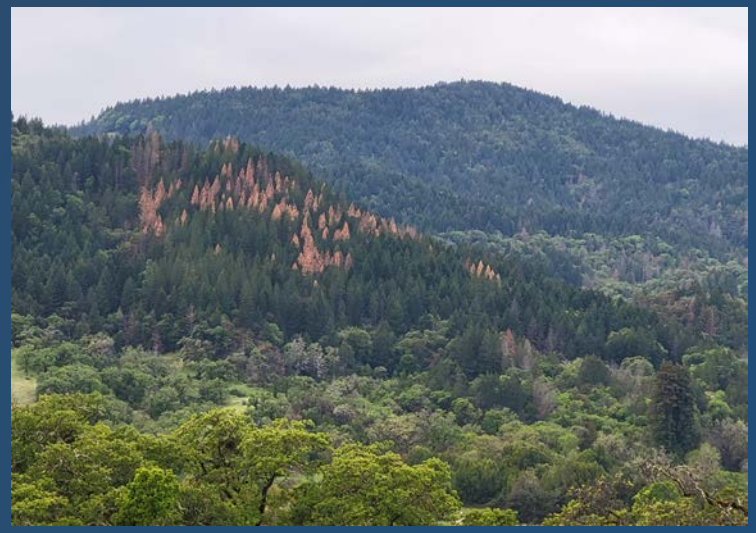
UC CE | University of California Agriculture and Natural Resources | Cooperative Extension

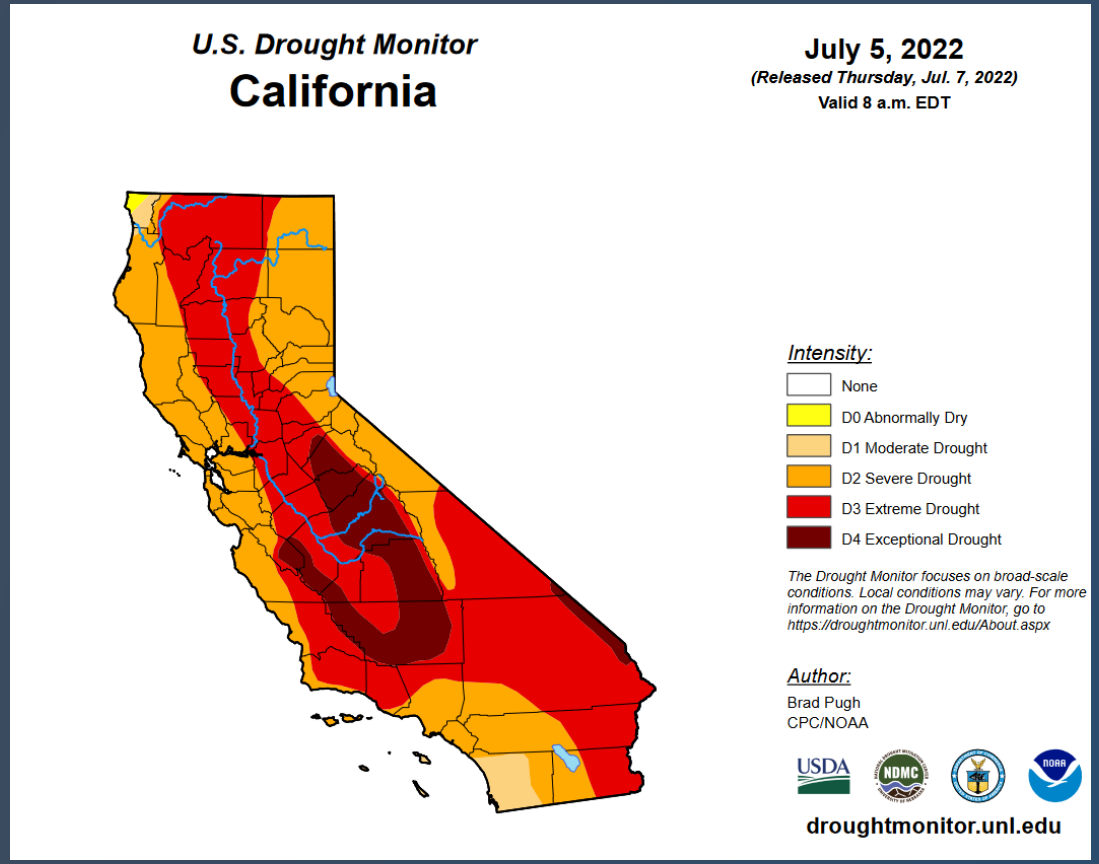
Forest Health

- Forests are Dynamic
- Dead trees are important
- Disturbances are important
  - Abiotic (e.g., weather, drought, fire)
  - Biotic (e.g., anthropogenic, animals, insects and diseases)
  - Create canopy gaps, alter forest structure, enhance vegetative and wildlife diversity, nutrient cycling, food

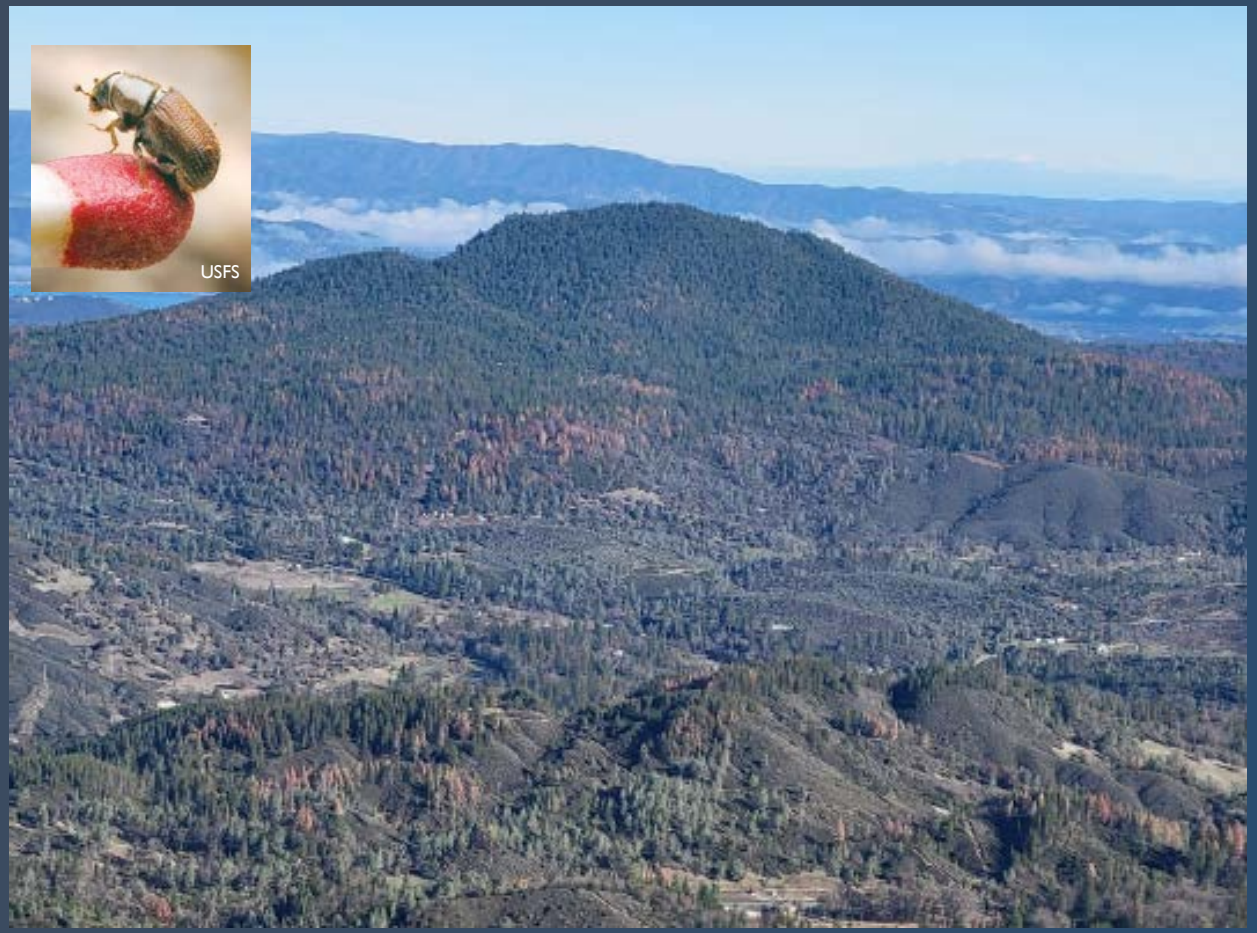


C. Lee, CAL FIRE

DISTURBANCES ALIGN…



Landscape Scale Tree Mortality



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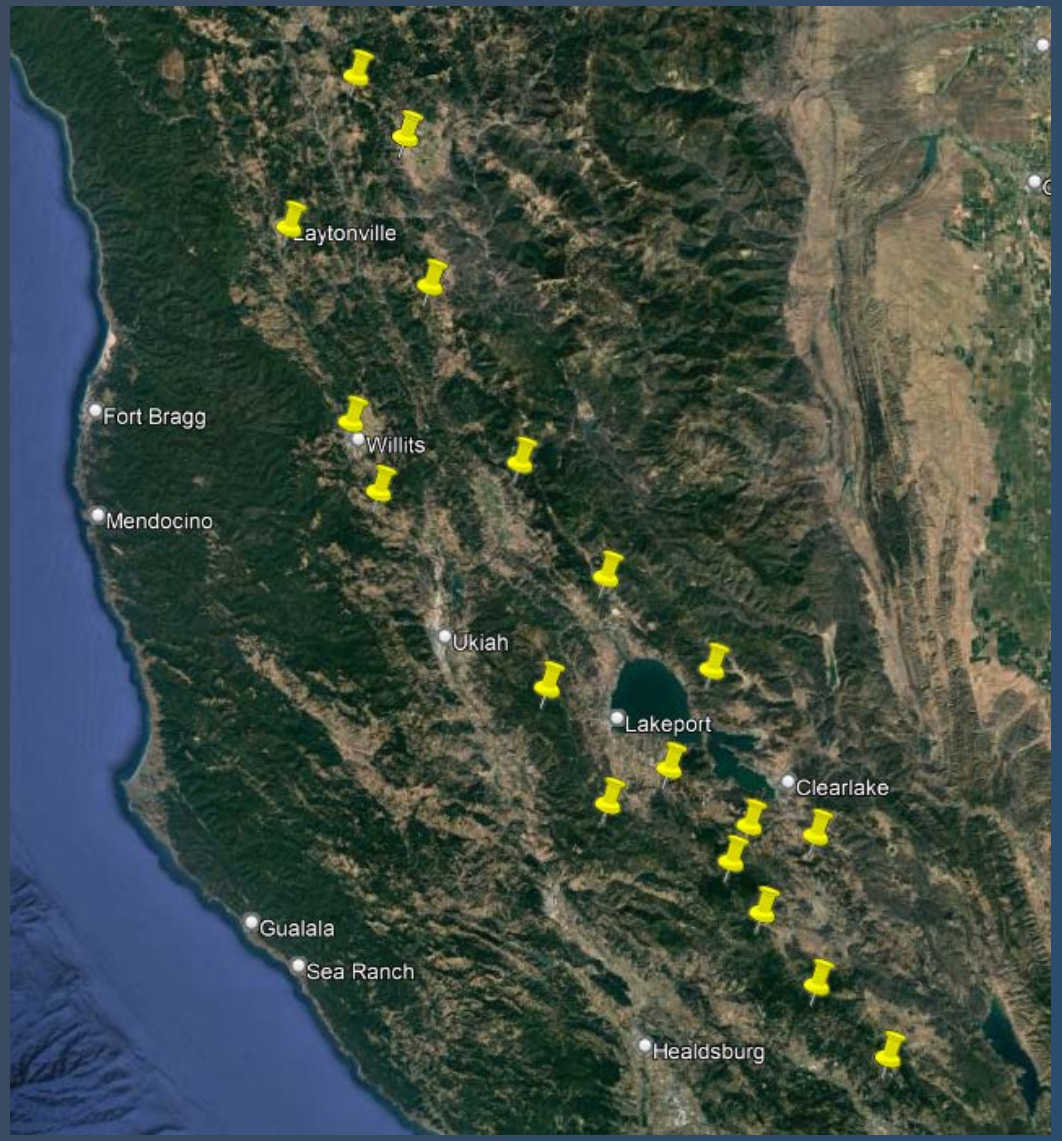
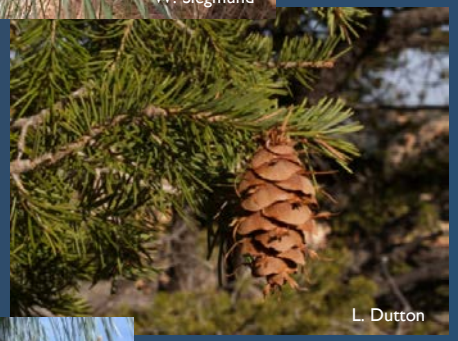
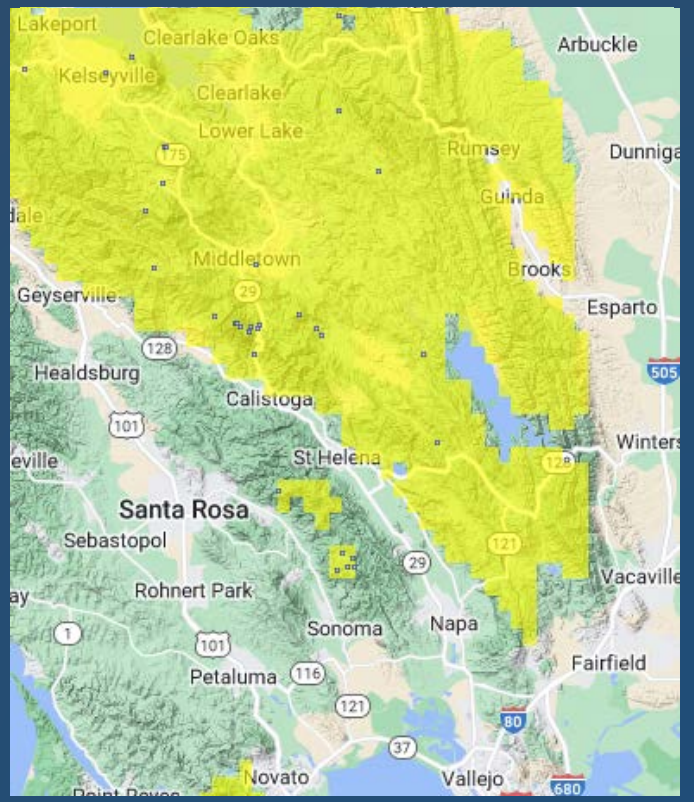


Conifers Impacted

- Ponderosa pine (*Pinus ponderosa*)
- Douglas-fir (*Pseudotsuga menziesii*)
- Grey pine (*P. sabiniana*)
  - e.g., ghost pine, Sierra foothill pine
- Knobcone pine (*P. attenuata*)





Images from Calscape

Identifying Bark Beetle Infested Trees

- Identification
  - Canopy Decline
  - Pitch tubes
  - Galleries (feeding tunnels)
    - Associated fungal infections

Insects of the Current Outbreak

- Western Pine Beetle (*Dendroctonus brevicomis*)
  - Hosts: Ponderosa pine (*P. ponderosa*)
  - Attracted to stressed trees, can mass attack
- Red Turpentine Beetle (*Dendroctonus valens*)
  - Hosts: Pine (*Pinus* sp.)
  - Common in fire stressed ponderosa pine
- *Ips* (multiple species)
  - California fivespined ips (*Ips paraconfusus*)
  - *Orthotomicus* (=*Ips*) *spinifer*
  - Hosts: western pine species
  - Infest slash

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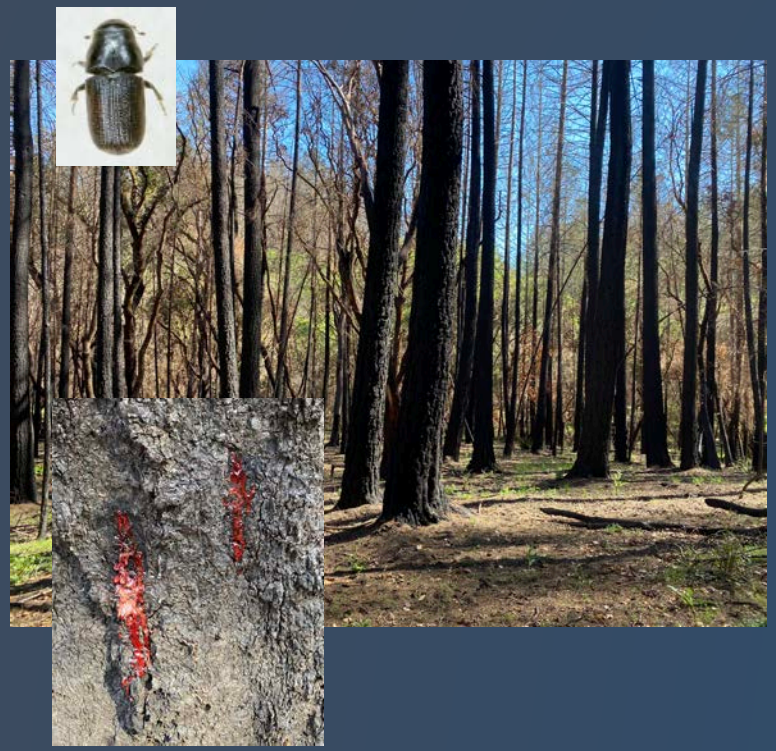
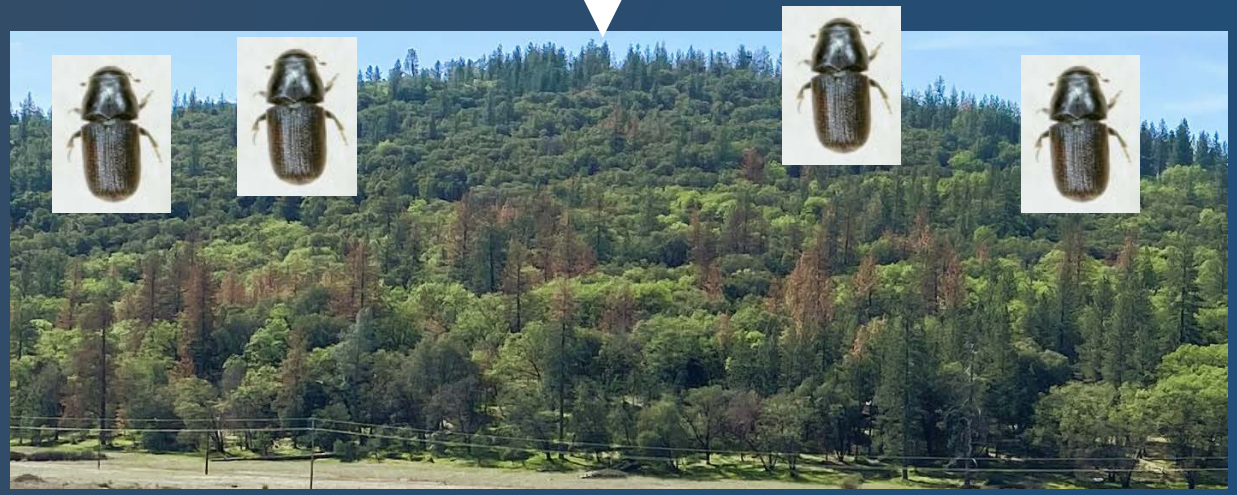
Figure 8—*Ponderosa pine killed by California fivespined ips population that built up in the slash piles in the foreground.*

Insects of the Current Outbreak

- Flatheaded fir borer (*Phaenops drummondi*)
  - Hosts: Fir (*Abies* spp.) & Douglas-fir (*P. menziesii*)
  - Common in stressed, downed trees
- Douglas-fir Engraver (*Scolytus unispinosus*)

Insect Outbreaks





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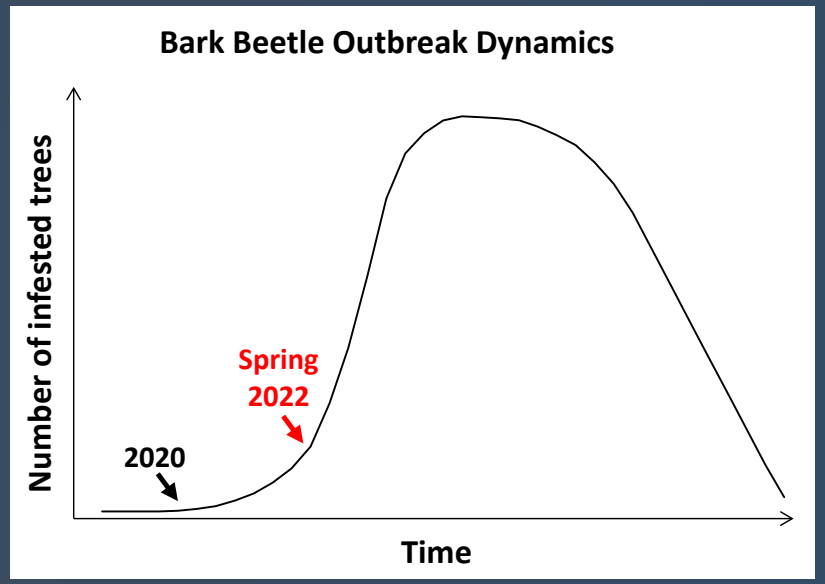

Managing Bark Beetles

- The current infestation will run its course
- Integrated Management Approach
- Remove and destroy infested material
- Remove dead trees
  - Hazards
  - Fuels reduction

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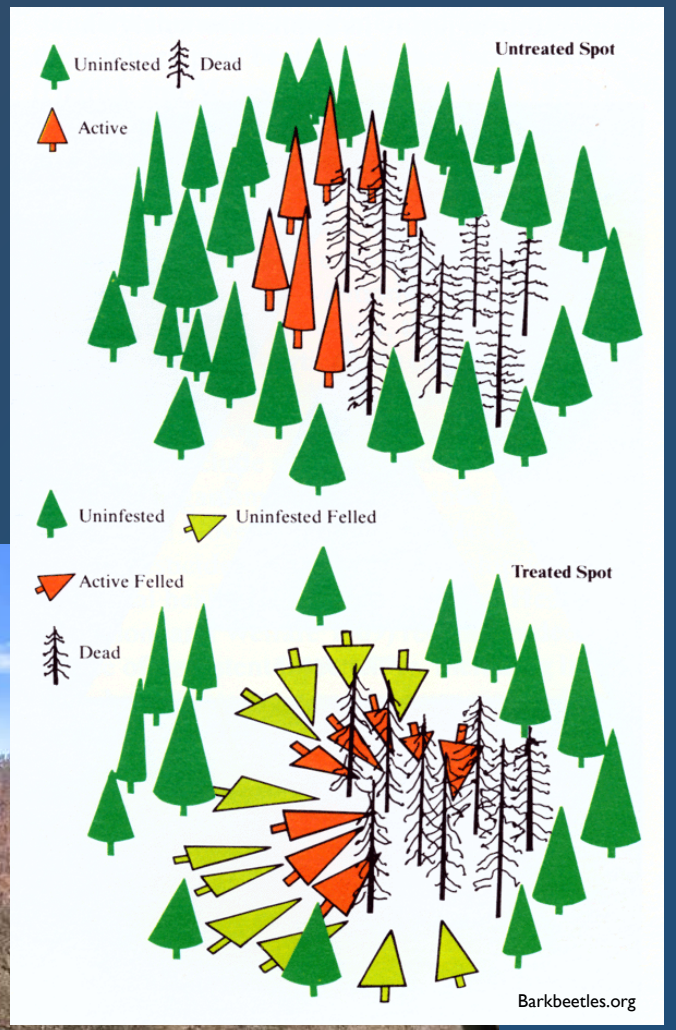
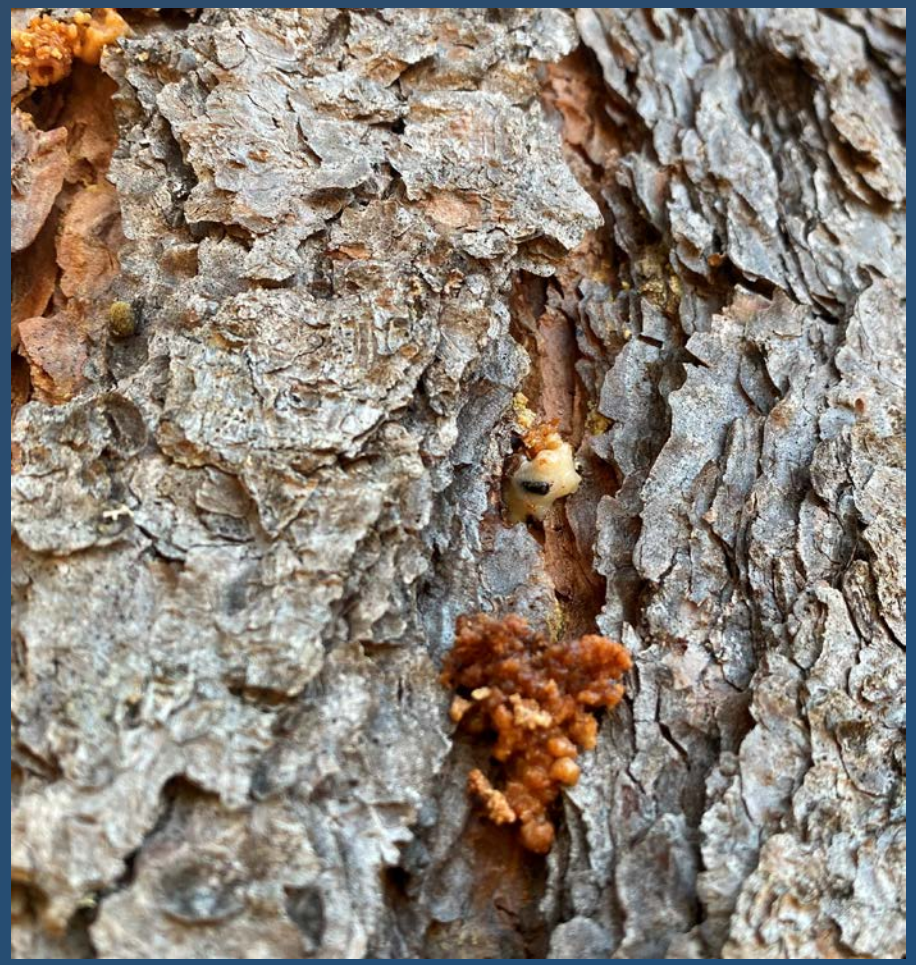


Managing Bark Beetles

- Thinning
  - Improve vigor and health
  - Remove/destroy slash
- Insecticides
  - Before infested to prevent beetles from attacking trees
- Pheromones
  - Prevent mass attacks & mating disruption
- Supplemental watering
- Plant nonsusceptible hosts

Resources

- UCCE Mendocino – Forest Health & Forest Resources
  (https://cemendocino.ucanr.edu/Forestry/)
- UC IPM Bark Beetle Management
  (http://ipm.ucanr.edu/PMG/PESTNOTES/pn7421.html)
- US Forest Service FIDL – western pine beetle
  (https://www.barkbeetles.org/western/WPBFIDL1.htm)
- US Forest Service western pine beetle management guidelines
  (https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5188577.pdf)
- US Forest Service pine Ips species management
  (https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5299326.pdf)



Thank You

Questions?

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