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**Forest Entomologist**  
**Forest Insect Update**  
**Jefferson Co-2008**

## Bark Beetles (Family Curculionidae)



(Manning)

- Small cylindrical beetles
- 600 sp. native to western U.S.
- 100 sp. in Colorado
- Many bark beetles infest only dead or dying parts of host

## Bark Beetle Galleries

|  |   |
|--|---|
|  <p>Douglas-fir beetle<br/><i>Dendroctonus pseudotsugae</i><br/>1/8-1/4 in.</p> |  <p>lps engraver beetle<br/><i>lps</i> sp.<br/>1/3-1/4 in.</p>                   |
|  <p>Mountain pine beetle<br/><i>Dendroctonus ponderosae</i><br/>1/8-1/3 in.</p> |  <p>Western pine beetle<br/><i>Dendroctonus brevicomis</i><br/>1/16-3/16 in.</p> |



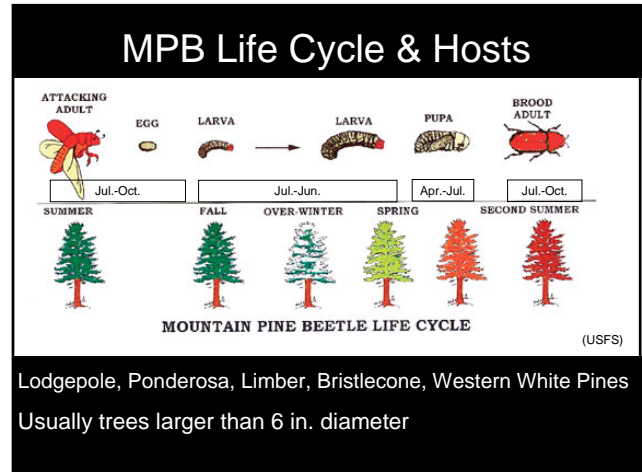


(USFS)  
(1/8 - 3/8 in.)

## Mountain pine beetle

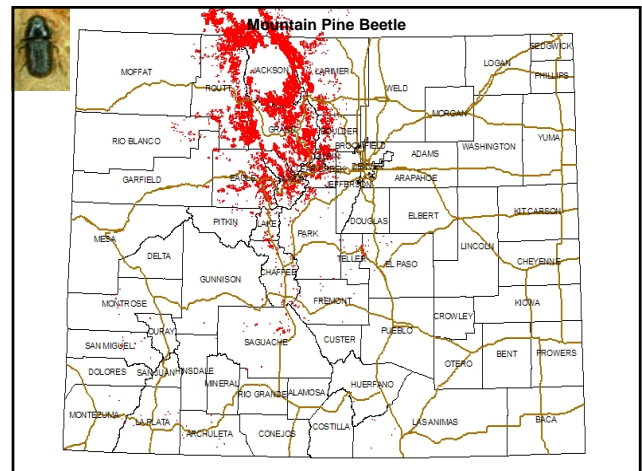
*Dendroctonus ponderosae*

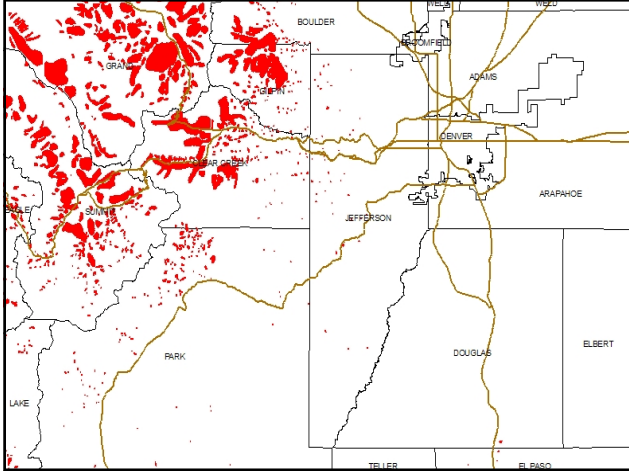
Hosts: Lodgepole, Limber, Ponderosa, Bristlecone, White pines



### What makes trees susceptible to bark beetle attack?

- Climatic factors
  - Drought
  - Warm winters
- Fire suppression
- Dense forests
- Mature and overmature trees
  - >80 years
  - Homogenous landscape





### Symptoms and Signs

"Pitch" tubes, and mass attack

(CSFS)

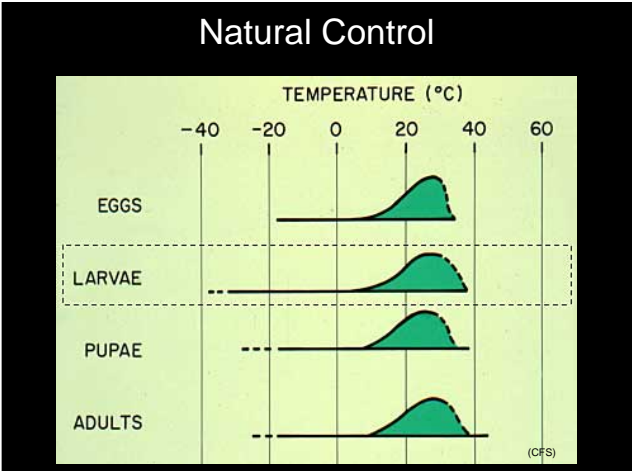
Gallery construction and larval development

This block contains four photographs illustrating symptoms and signs of beetle infestation. The top-left photo shows "pitch" tubes and mass attacks on tree bark. The top-middle photo shows gallery construction and larval development, with a small "(CSFS)" label below it. The top-right photo shows a close-up of a tree trunk with a large, irregular hole. The bottom-right photo shows a cross-section of a tree trunk with a circular hole.

### Trees Fight Back!

(CSFS)

A close-up photograph of a tree trunk showing a small beetle and a white, resinous pitch tube. A small black box highlights the beetle. The text "Trees Fight Back!" is written in yellow at the top. The label "(CSFS)" is at the bottom right.



Parasitoids: lay eggs on mountain pine beetle larvae, killing it before it develops



Mountain pine beetle predators: feed on all stages of the mountain pine beetle, e.g. wood peckers, predatory beetles



### Minimizing bark beetle damage

- Reduce population (Suppression)
  - Prompt removal of infested trees and destruction of brood (chipping, debarking, burning, solar treatment)



(CSFS)



(CSFS)



## Minimizing bark beetle damage


- Short term (Preventive)
  - Preventive sprays (high-value non-infested trees)
  - Sevin SL (carbaryl), Astro (permethryn), Onyx (bifenthrin)
  - Before beetle flight (May-June)
  - Trees > 5 in.
  - Certified and licensed applicator
  - Right dose, time
  - Trunk, ground up to 30 ft. or 5 in. diameter
  - Expensive
  - Non-target insects and other animals





### Verbenone for MPB

CN1C=CC(=C1)C(=O)O

Cost: ~\$8/pouch  
 Area protection: 40 pouches/acre  
 Tree protection: 2+ pouches/tree

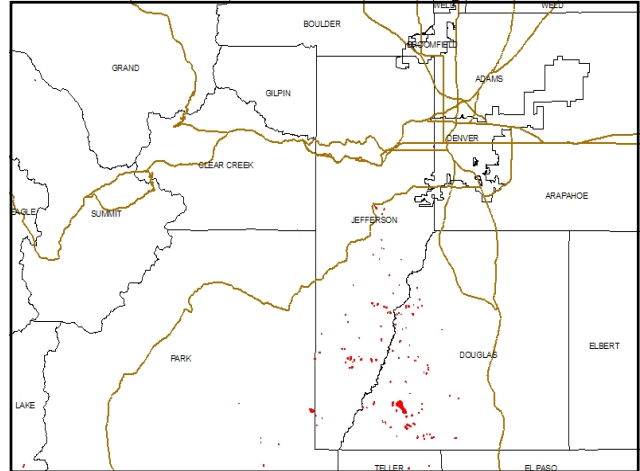
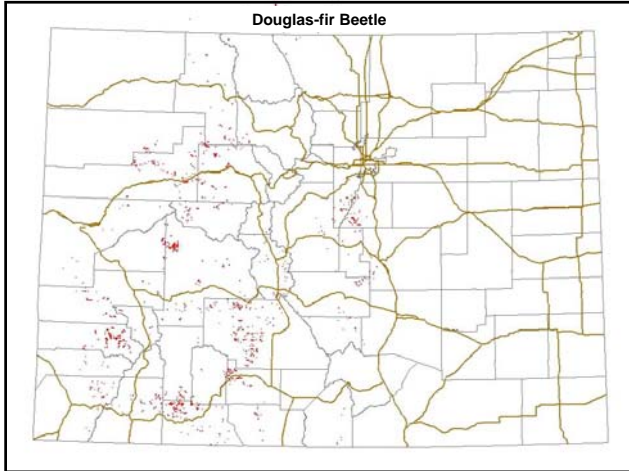


### Douglas-fir Beetle



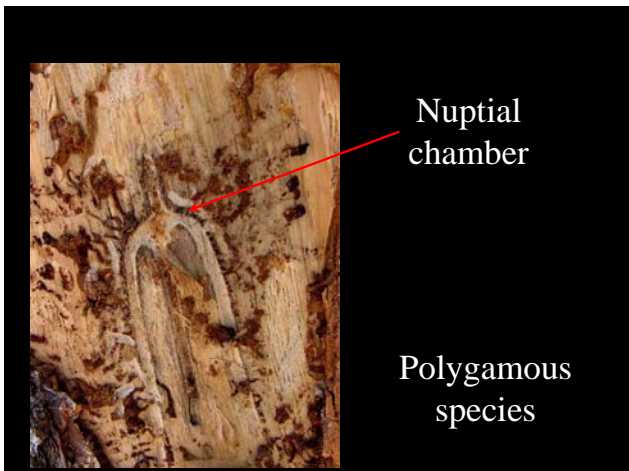
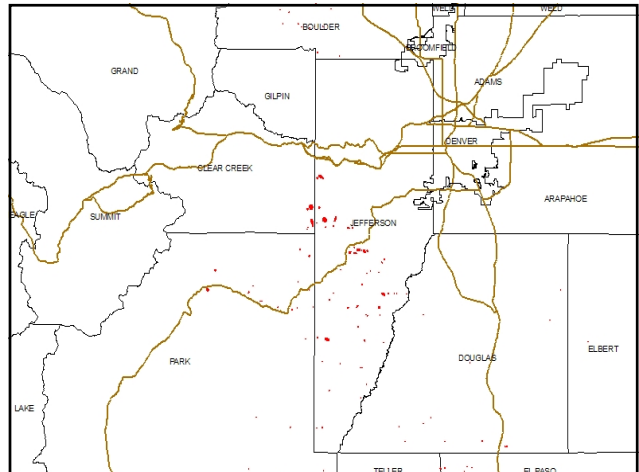
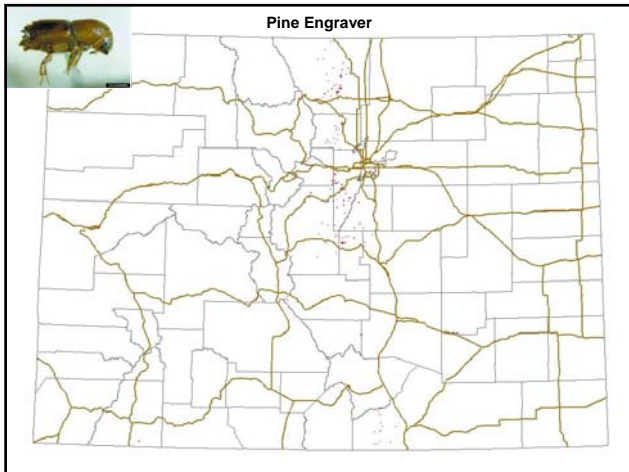




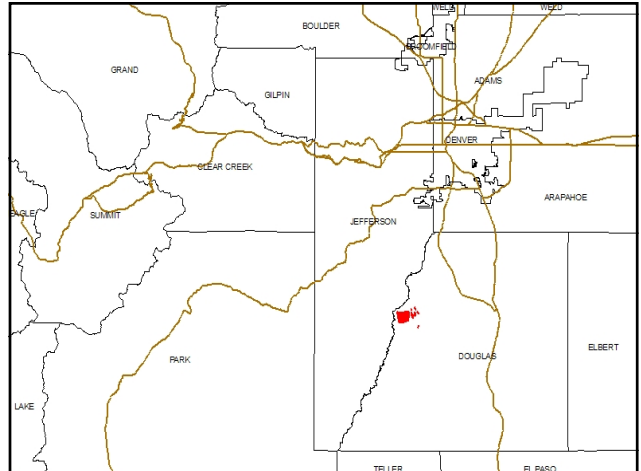
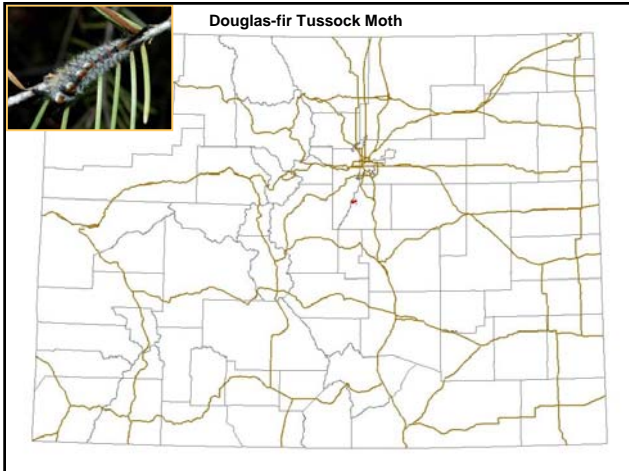
## Douglas-fir beetle Management

- Destroy brood in infested trees (chip, debark, burn)
- MCH, anti-aggregant pheromone effective for individual tree and area protection





- ### Ips Management and Thinning
- Conduct thinning in Sept.-Dec.
  - Monitor green slash and standing trees
    - especially if drought conditions
  - Remove larger timber ( $\geq 4$  inches)
  - If cutting during warmer months
    - treat slash
  - Avoid wounding
  - Remove standing infested trees



### Douglas-fir tussock moth



Female moth, egg mass, pupal case



Larva



Male moth

### Management



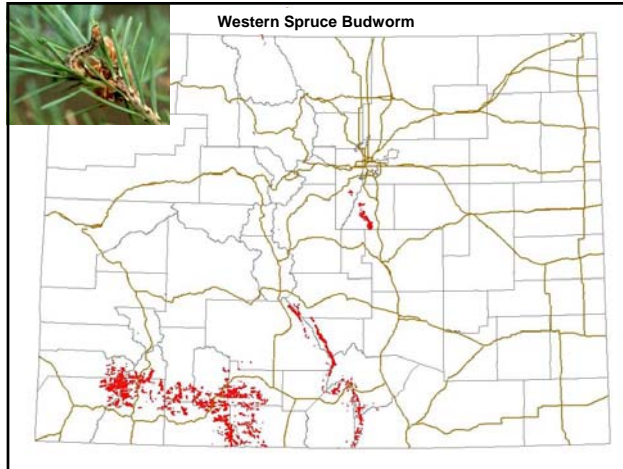
(CSFS)

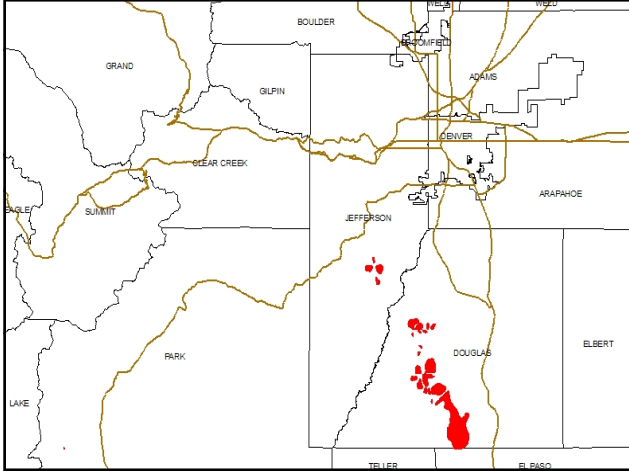
- Assess damage
- *Bt*
- Spinosad
- Pyrethroids
- Carbaryl

### Western Spruce Budworm



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### Western Spruce Budworm

- Adults emerge in July-August
- Egg masses on underside of needles

### Management

- *Bt*
- Carbaryl

(www.forestryimages.org)

### Minimizing Insect and Disease Damage

Long term

- Maintaining healthy forest conditions
- Regular thinning
- Harvesting of some mature trees
- Uneven aged stands
- Species diversity

(CSFS)

## QUESTIONS?

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