

Wesley Nettleton

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Forest Health Protection  
USDA Forest Service

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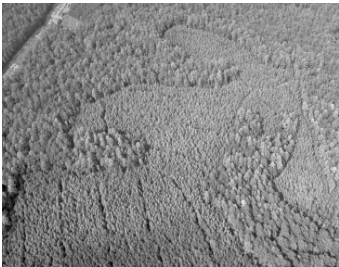
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### Southern Pine Beetle

Most Aggressive and Destructive Forest Pest in  
the Southern United States



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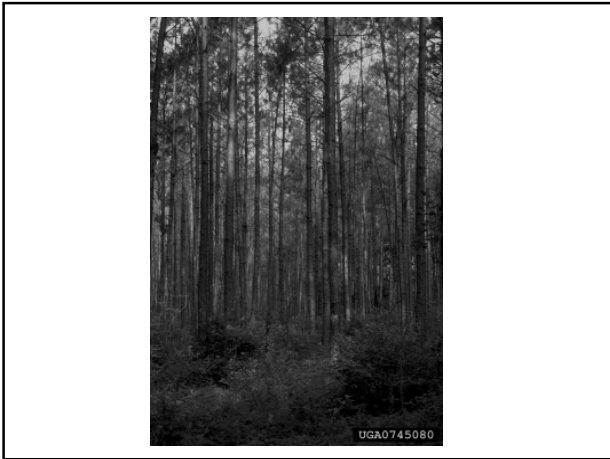
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Video Clip  
SPB Biology

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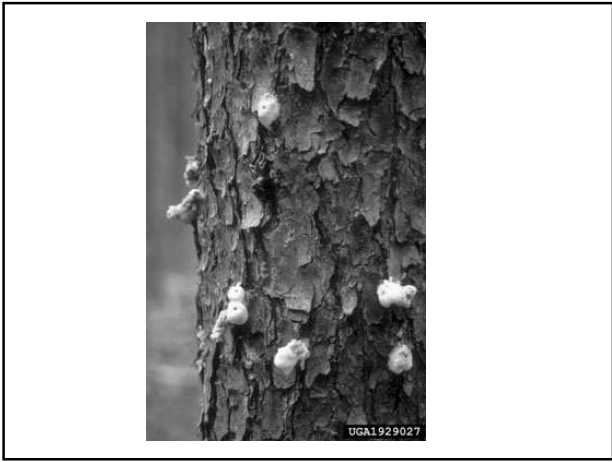
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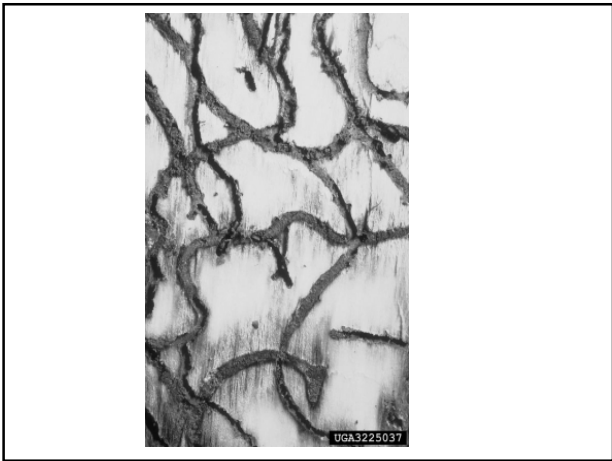
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## Southern Pine Beetle

- Affects southern pine trees across the South
- Outbreaks are cyclic; occurring every 7-10 years and lasting for 2-3 years
- Population buildup is affected by the health of the forest and environmental conditions
- Without prompt suppression activities, infestations may expand rapidly, killing hundreds of trees

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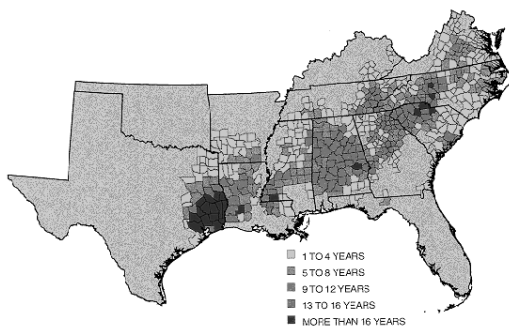
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## Historical Occurrence



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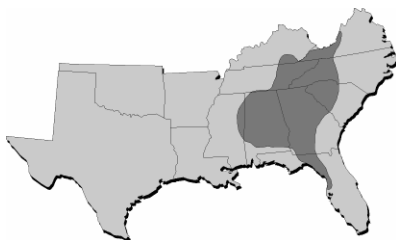
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## Current Situation

SPB populations have been very high for the last 2 years, affecting all ownerships in 9 Southern states



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## Impacts of the Current Outbreak

- SPB has killed 500,000 acres of pine forests in the south in 2000 and 2001
- Southwide losses in 2000/01 estimated at \$525 million

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## Impact Examples

Millions of dollars of forest resources are at risk.



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## SPB and T&E Species

SPB is responsible for over half the mortality of red cockaded woodpecker cavity trees



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## SPB in the Wildland/urban Interface

- Infestations have moved into residential areas
- Control costs escalate as one infestation may impact multiple homeowners



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## Direct Control Options

- Cut and remove
- Cut and leave
- Cut and hand spray
- Cut, pile and burn
- Do nothing

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Video Clip  
SPB Control

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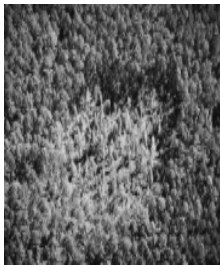
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Control Effectiveness

It is projected that SPB spread can be reduced by 80% with aggressive suppression activities



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Long Term Strategy  
“Prevention”

A long term strategy of reducing hazard from SPB by treating high risk stands would be effective in minimizing future outbreaks

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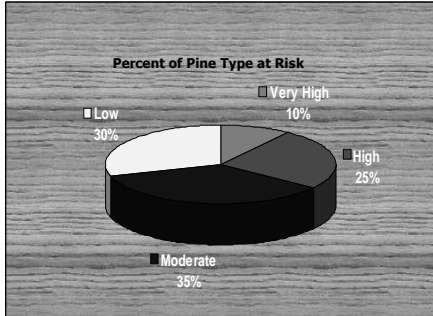
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## Long Term Strategy “Prevention”



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## Hazard Rate Your Stand!

- There are a number of SPB hazard rating systems
- They vary by state and location
- Consult with your local forestry specialist for recommendations

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## Prevention Silviculture

- Promote Individual Tree Resistance
- Promote Stand Resistance
- Minimize Disease and Competition problems

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### Promote Individual Tree Resistance

- Favor most resistant species
  - Consider longleaf or slash
  - But match species to site

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### Promote Individual Tree Resistance

- Remove damaged trees
  - Especially lightning struck trees



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### Promote Stand Resistance

- Thin dense or stagnant stands
- Mix pine and hardwood
- Minimize logging damage
- Regenerate overmature stands
- Lower planting density

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High Hazard Stand



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SPB Infested Stand



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Low Hazard Stand



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High Hazard Sawtimber Stand



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High Hazard Sawtimber Stand



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Low Hazard Sawtimber Stand



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### Promote Stand Resistance

- Thin dense or stagnant stands
  - Reduce pine basal area to 80 square feet per acre or less
  - Maintain at least 25 feet between mature pines

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### Promote Stand Resistance

- Mix pine and hardwood
  - Forest stands that contain both pine and hardwood are less susceptible to beetle attack

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### Promote Stand Resistance

- Minimize logging damage
  - Monitor any mechanical operations
  - Avoid excessive tree scarring and soil compaction
  - Minimize changes in soil and water levels around pine trees

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### Promote Stand Resistance

- Lower planting density
  - Lack of markets for first thinnings
  - 400 to 500 pines per acre is OK

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### Promote Stand Resistance

- Regenerate overmature stands
  - Trees with reduced radial growth are at greater risk to SPB attack

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### Minimize Disease and Competition Problems

- Annosus root rot
- Littleleaf disease
- Fusiform rust
- Use prescribed fire

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### What Can You Do?

- Thin your stands
- Harvest at or before maturity
- Rapidly control any SPB spots that do occur

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### Pine Engraver Beetles

- Also known as *Ips* bark beetles
- Damage appears similar to SPB
- Generally not as serious as SPB
- Commonly occur during drought conditions

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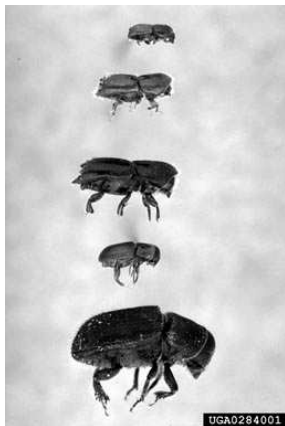
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Pitch Tubes on Infested Tree



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Close up of Pitch Tube



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Boring Dust at Base of Tree



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Note Vertical Egg Gallery  
Pattern



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*Ips* infested tree



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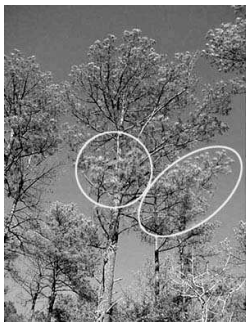
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Note Red Crown and Green  
Branches



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### Pine Engraver Beetles

- Three species
- Vertical H shaped egg galleries
- Seldom bother healthy trees
- Tend to attack scattered single trees
- Very difficult to predict which trees may become attacked

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### Control Options

- If only a few trees attacked do nothing
- Prompt removal of infested trees is best
- Do not use cut and leave
- Do not cut a buffer strip of uninfested trees

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### Prevention

- Pray for rain
- Stands with lower basal area are less likely to become attacked
- Avoid mechanical injury to trees

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## Gypsy Moth

- Most significant hardwood tree defoliator
- Introduced in US in 1869
- Established in northeastern US
- Virginia is generally infested
- Isolated infestations have occurred in NC, TN, KY, GA and AR

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## Gypsy Moth Caterpillar



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## Video Clip Gypsy Moth Biology

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### Defoliated Stand



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### Aerial View of Defoliation



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### Effects of Defoliation

- Healthy trees can withstand one or two defoliations
- Defoliated trees will have reduced growth
- Defoliated trees are more vulnerable to tree diseases

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### Most Susceptible Trees

- White oak
- Sweetgum
- Northern red oak
- Chestnut oak
- Post oak
- Water oak
- River birch
- Southern red oak
- Scarlet oak
- Basswood
- Laurel oak
- Willow oak
- Hawthorn

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### Moderately Susceptible Trees

- Hickory
- American beech
- Maple
- Black gum
- Pine
- Cherry

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### Least Susceptible Trees

- Ash
- Yellow poplar
- Sycamore
- Locust
- Juniper
- Mulberry

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## Should I Worry about Gypsy Moth?

- Where do you live?
- What are your management goals?
- Are your stands predominantly oak?

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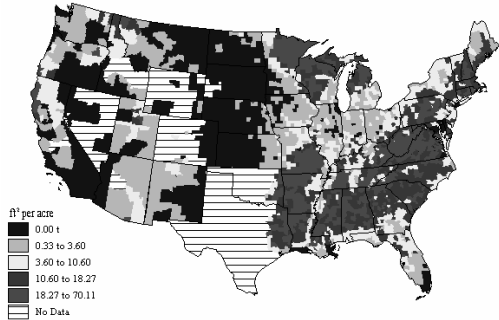
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## Potential Range of Gypsy Moth

Total Basal Area of Preferred Species



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## Pales Weevil



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### Pales Weevil

- Attracted to cut over pine stands
- Serious pest of pine seedlings
- Not uncommon to have 30 to 60 percent weevil caused mortality

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### Weevil Feeding Damage



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### Management Options

- Delay planting 1 year
- Use treated seedlings

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### Hemlock Woolly Adelgid



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### Video Clip Hemlock Woolly Adelgid

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### Hemlock Woolly Adelgid

- Single greatest threat to hemlock as a forest resource
- Introduced from Asia in 1950's
- Occurs in 12 states
- Half the range of hemlock is infested
- Detection is difficult

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## Hemlock Woolly Adelgid

- Current survey methods not adequate
- Insecticidal control is expensive
- Biological control may be only means to manage HWA in forest

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Good Forest Management Is  
Good Pest Management!

Good Night

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