SPB: An aggressive/primary tree-killer, a cyclical outbreak species, and an area-wide pest
Outbreak: 1 SPB Spot per 1,000 acres of host type (loblolly/shortleaf, Oak-pine)
For Further Discussion

• How can we improve markets?
• Should we thin during an outbreak?
• Should we burn during an outbreak?
• Can we improve our spring trapping prediction system?
Key Findings from the 2016 Southern Pine Beetle Outbreak on the National Forests in Mississippi

Homochitto (361 SPB spots) and Bienville (317 SPB spots) National Forests

**Age Distribution of Loblolly Pine Stands**

- Homochitto NF:
  - < 45 yrs. old: 66,660 acres
  - 45 yrs. old and older: 53,186 acres

- Bienville NF:
  - < 45 yrs. old: 78,154 acres
  - 45 yrs. old and older: 45,416 acres

**SPB Spot Distribution by Loblolly Stands**

- Only 3 spots occurred on the nearly 13,000 acres of young loblolly stands which were thinned in the previous decade.

- 99% of all SPB spots in young loblolly stands occurred in areas which had not been thinned.

- On these two National Forests, 85,000 acres of young loblolly pine stands are in need of thinning or other treatments to prevent or minimize outbreaks of SPB in the future.

**Proper Thinning of Pine Stands Prevents Southern Pine Beetle Spots.**

For more information about Southern Pine Beetle and this study, contact James Meeker at jrmeeker@fs.fed.us or John Nowak at jnowak@fs.fed.us.
Relationship between resin flow and SPB; Resin flow related to tree growth; thinning increases tree growth.

Hopkins (1899); Vite′ (1961); Shopmeyer and Larson (1985); Brown et al. (1987); Nebeker/Hodges et al. (1992);
Economic Dynamics of Forests and Forest Industries in the Southern United States

Thomas J. Brandeis, Andrew J. Hartsell, James W. Bentley, and Consuelo Brandeis

Figure 16—Total change in the number of primary wood-processing facilities as derived by timber product output survey, Southern United States 2005–09. Each dot represents one mill.

Figure 20—Total change in employment of primary wood-processing facilities as derived by timber product output survey, Southern United States, 2005–09. Each dot represents one individual.

Figure 6—Total change in softwood saw-log production as derived by timber product output survey, Southern United States, 2005–09. Each dot represents 10,000 cubic feet of change.
Thinning to 80 sq. ft./ac. or less is currently the most effective and efficient means of preventing SPB losses.
Thinning Recommendations

• Thinning will prevent SPB
• Thin by spacing
• Consider 20’ distance between trees
• Create an open understory
Pheromone Plume Modelling Results

- Thinning has a dramatic influence on ventilation, incident solar radiation and dispersive characteristics of the in-canopy environment.
SPB Prevention Accomplishments: Individual Treatments

- Other/Unknown: 6,008, 36%
- low-density planting: 662, 4%
- Longleaf Restoration: 1,761, 11%
- Restoration: 642, 4%
- Prescribed Burning: 272, 2%
- PCT: 1,790, 11%
- First Thinning: 5,321, 32%
Beetle Behavior Changes with Seasons

Winter - scattered, dispersed and less active

Spring – peak dispersal and spot initiation

Summer – spot growth and proliferation phase, slumps with periods of extreme heat

Fall – secondary dispersal phase
South-wide Spring Pheromone Trapping Survey
Black Turpentine Beetle
*Dendroctonus terebrans*

Southern Pine Beetle
*Dendroctonus frontalis*

Ips Pine engravers
- *Ips avulsus*
- *Ips grandicollis*
- *Ips calligraphus*
Vulnerability to SPB was modeled generally according to the following criteria:

1. Increasing with increases in **basal area** (basal area below 10 sq. ft. was excluded; 46% weighting)
2. Increasing with increasing **average diameter** (diameters below 3” were excluded; 23% weighting)
3. Increasing with increasing **stand density** (low stand densities were excluded; 15% weighting)
4. Increasing with increases in the number of **historical outbreaks** in a county (15% weighting)

### 2012 National Insect & Disease Risk Map (NIDRM)

**SPB County Hazard Rating for Mississippi**

*Map showing the percentage of counties rated as moderate or high hazard.*
Homochitto National Forest Southern Pine Beetle Spots - 2017
Survey Dates: May 24, 25 *

- Active Spot (565)
- National Forest Lands
- Non-FS Lands

SPB Hazard
Percent of county rated as moderate or high hazard
- < 1%
- 1 - 10%
- 10 - 25%
- 25 - 40%
- > 40%
SPB Control: Cut and Remove

- Identify active spot “head” of recently-infested trees
  - fresh boring dust & pitch tubes, green or fading crowns
- Mark buffer strip around active head
  - Width ~ avg. height of trees
- Remove infested and buffer trees ASAP
- Vacated trees may be left standing
SPB Control: Cut and Leave

- Fell infested and buffer trees toward spot center and leave on ground

- Objectives: Disrupt pheromone biology and beetle attack behavior, halt spot expansion