



Figure 1: The southern pine beetle (*Dendroctonus frontalis*) is historically the most destructive forest insect pest of Southeastern forests.

### 2016 Mississippi Southern Pine Beetle Predictions

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The Mississippi Forestry Commission participates annually in a south-wide southern pine beetle (*Dendroctonus frontalis*, Fig. 1) survey. The southern pine beetle (SPB) has the potential to destroy millions of acres of pine timber in any given year. The Texas Forest Service has developed a reliable system (Fig. 2) for predicting SPB infestation trends (increasing, static, and declining) and levels (low, moderate, high, and outbreak) that has been implemented

across the South since 1986. This information provides forest managers with valuable insight for better anticipating SPB outbreaks and more lead-time for scheduling detection flights and preparing suppression programs.

Each spring, Lindgren funnel traps (Fig. 3) baited with SPB attractant pheromones (frontalin) and volatile host compounds (alpha-pinene and beta-pinene) are set out in pine forests. One to four traps (depending on location and amount of susceptible host type in each county) were placed in 19 Mississippi counties (Table 1), and the contents of each trap were collected weekly for four weeks.

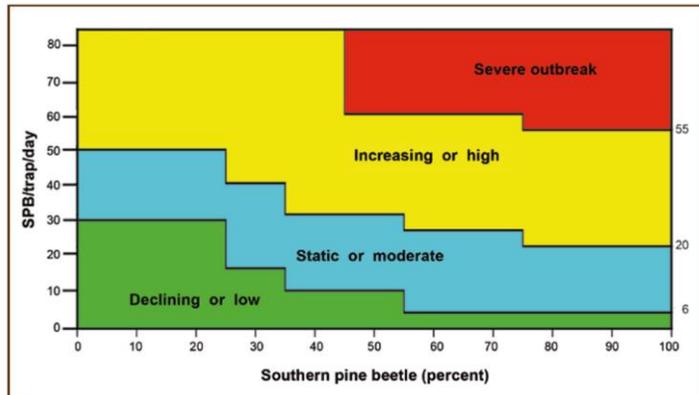


Figure 2: The annual regional SPB prediction relies on this system to predict SPB severity during the survey year, and is based on the number of SPB captured per trap per day, and the percent SPB (vs. their major predator, the checkered clerid beetle) per trap per day. From: Billings, R. F. and W. W. Upton. 2010. A methodology for assessing annual risk of southern pine beetle outbreaks across the southern region using pheromone traps. Pp. 73-85. In: Advances in Threat Assessment and Their Application to Forest and Rangeland Management - Volume 1. Pye, J. M., H. M. Rauscher, Y. Sands, D. C. Lee, and J. S. Beatty, Technical Editors. Volume 1. Gen. Tech. Rep. PNW-GTR-802. Portland OR. U.S. Department of Agriculture, Forest Service. Pacific Northwest and Southern Research Stations. 246 p.

The numbers of SPB and their primary predator, the checkered clerid beetle (*Thanasimus dubius*, Fig. 4), were counted in each sample. These data form the basis for a SPB risk rating system (Fig. 2) developed by the Texas Forest Service. The calculations take checkered clerid beetles into account because they are important in regulating SPB populations.

Average trap catches that exceed 30 SPB/day, especially those in which SPB make up more than 35% of the total catch (of SPB and clerids), are indicative of increasing or continued high SPB infestation levels in the current year. Conversely, when catches of predators far outnumber those of SPB and fewer than 10 SPB adults are caught per day, infestation trends are likely to decline or remain at low levels.

Annual predictions of infestation trends have historically proven to be 75-85% accurate. Collectively, trend predictions from numerous specific locations provide insight into SPB population shifts within a given state as well as across the South.

Also, comparison of trapping results for the current year with those from the previous year for the same localities provides additional insight into SPB population changes.

Although most MFC Districts reported low southern pine beetle numbers in Mississippi this year, the **counties within the Southcentral and Southwestern MFC Districts, especially those near Homochitto and Bienville National Forests, reported elevated SPB numbers. Additionally, an increasing number of counties reported at least a few southern pine beetles in traps**, indicating SPB populations may be slowly rising and becoming more evenly distributed statewide. This trend has been steadily increasing since 2011. SPB were intercepted in 15 of 19 counties sampled during 2016 and in 16 of 18 counties in 2015, vs. much less even distributions in previous years (14 in 2014, 10 in 2013, 7 in 2012, and 5 counties during 2011). Additionally, **the statewide total number of SPB captured during 2016 (10,295) was on the rise again**, compared to 463 in 2015, 578 in 2014, 6,113 in 2013, 149 in 2012, and 579 in 2011. Although somewhat sporadic, the total number of SPB captured over the last few years seems to be increasing.



Figure 3: A Lindgren funnel trap, used throughout Mississippi each spring to monitor southern pine beetle populations.

Landowners in Mississippi should take advantage of low SPB populations and make sure their timber is at a healthy stocking density, and have their stands thinned if needed, which would reduce their stands for inevitable SPB outbreaks in the future. Further information regarding preventative thinning of pine stands to protect from SPB attack is available from MFC Offices upon request.



Figure 4: The checkered clerid beetle, *Thanasimus dubius*, the most important predator of the southern pine beetle.

We appreciate Dr. Ronald Billings of the Texas Forest Service (979-458-6650, or [rbillings@tfs.tamu.edu](mailto:rbillings@tfs.tamu.edu)) for developing the SPB risk rating system and for providing south-wide summaries and predictions. The results for the entire south-wide survey are posted on the Texas Forest Service Website. Additional thanks to the MFC foresters who placed and checked the traps throughout Mississippi.

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**Table 1: Mississippi Southern Pine Beetle Spring Survey Summary Results for 2016.** All traps were baited with Sirex lure (70%  $\alpha$ -pinene, 30%  $\beta$ -pinene) and 2 frontal capsules. Although many counties reported low southern pine beetle numbers in Mississippi this year, an increasing number of counties reported at least a few southern pine beetles in traps, indicating SPB populations may be slowly rising and becoming more evenly distributed statewide.

District	County	# Traps	# SPB	# Clerids	% SPB	SPB/Trap/Day	Clerids/Day	Prediction	
Mississippi Forestry Commission Trapping	Capital	Copiah	3	34	633	5.0	0.3	5.5	Low
	Capital	Simpson	4	2	126	2.0	0.0	1.1	Low
	<b>Capital Average</b>			<b>18</b>	<b>380</b>	<b>3.5</b>	<b>0.2</b>	<b>3.3</b>	<b>Low</b>
	EC	Leake	4	38	893	4.0	0.3	8.0	Low
	EC	Winston	4	435	1736	20.0	3.9	15.5	Low
	<b>EC Average</b>			<b>237</b>	<b>1315</b>	<b>12.0</b>	<b>2.1</b>	<b>11.8</b>	<b>Low</b>
	NE	Chickasaw	2	132	1316	9.0	2.4	23.5	Low
	NE	Itawamba	3	35	443	7.0	0.4	5.3	Low
	NE	Tishomingo	3	189	1080	15.0	2.2	12.9	Low
	<b>NE Average</b>			<b>119</b>	<b>946</b>	<b>10.3</b>	<b>1.7</b>	<b>13.9</b>	<b>Low</b>
	NW	Desoto	1	0	32	0.0	0.0	1.1	Low
	NW	Montgomery	4	2	770	0.0	0.0	7.3	Low
	NW	Panola	3	0	159	0.0	0.0	1.9	Low
	<b>NW Average</b>			<b>1</b>	<b>320</b>	<b>0.0</b>	<b>0.0</b>	<b>3.4</b>	<b>Low</b>
	SC	Scott	4	208	449	32.0	1.9	4.0	Low
	SC	Smith	4	1091	751	59.0	9.7	6.7	Moderate to High*
	<b>SC Average</b>			<b>650</b>	<b>600</b>	<b>45.5</b>	<b>5.8</b>	<b>5.4</b>	<b>Moderate*</b>
	SE	Forrest	4	1	77	1.0	0.0	0.7	Low
	SE	Stone	4	0	51	0.0	0.0	0.5	Low
	<b>SE Average</b>			<b>1</b>	<b>64</b>	<b>0.5</b>	<b>0.0</b>	<b>0.6</b>	<b>Low</b>
SW	Amite	1	79	21	79.0	2.8	0.8	Moderate to High*	
SW	Franklin	2	972	355	73.0	17.4	6.3	High	
SW	Lincoln	4	7029	543	93.0	66.9	5.2	High**	
SW	Marion	4	0	77	0.0	0.0	0.7	Low	
SW	Wilkinson	1	48	141	25.0	1.7	5.0	Low	
<b>SW Average</b>			<b>1626</b>	<b>227</b>	<b>54.0</b>	<b>17.8</b>	<b>3.6</b>	<b>Moderate to High**</b>	
<b>Statewide Average</b>			<b>542</b>	<b>508</b>	<b>22.3</b>	<b>5.8</b>	<b>5.9</b>	<b>Low but Increasing***</b>	
<b>Statewide Sum</b>			<b>59</b>	<b>10295</b>	<b>9653</b>				

\*Numerically, these ratings fell one prediction level lower, but rating levels were increased based on the dramatic increase in SPB/trap/day and or lack of clerid beetles over recent years.

\*\* These ratings were mostly driven by one trap in Lincoln county that yielded over 2,000 SPB per week for three weeks. This trap was near a recent logging site, therefore the prediction rating was lowered from what mathematically should have been an outbreak rating.

\*\*\*SPB numbers remain relatively low, but are more evenly distributed throughout the state than in recent years. A few areas in the Southcentral and Southwestern MFC Districts appear to have increasing SPB populations.