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2015 Mississippi Southern Pine Beetle Predictions

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

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 the SPB attractant pheromones (frontalin) and volatile host compounds (alpha-pinene and beta-pinene) are set out in pine forests when dogwoods begin to bloom. Dogwood blooms are used to indicate the peak SPB flight season. One to four traps (depending on location and amount of susceptible host type in each county) were placed in 18 Mississippi counties (Fig. 4), and the contents of each trap were

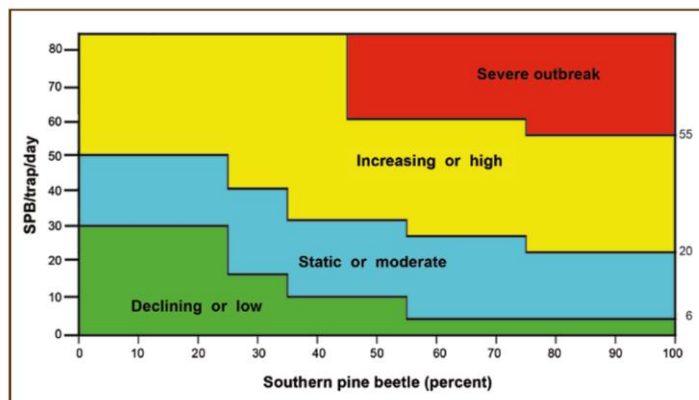


Figure 2: The annual regional SPB prediction relies on this system to predict SPB severity during the survey year, and is based on the number of SPB captured per trap per day, and the percent SPB (vs. their major predator, the checkered clerid beetle) per trap per day. *From:* Billings, R. F. and W. 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.

collected weekly for four weeks. The numbers of SPB and their primary predator, the checkered clerid beetle (*Thanasimus dubius*, Fig. 5), 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.

The USDA Forest Service also conducts similar surveys on Federal Lands throughout the South. Their results for National Forests in Mississippi are included along with those collected by the MFC in Table 1.



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

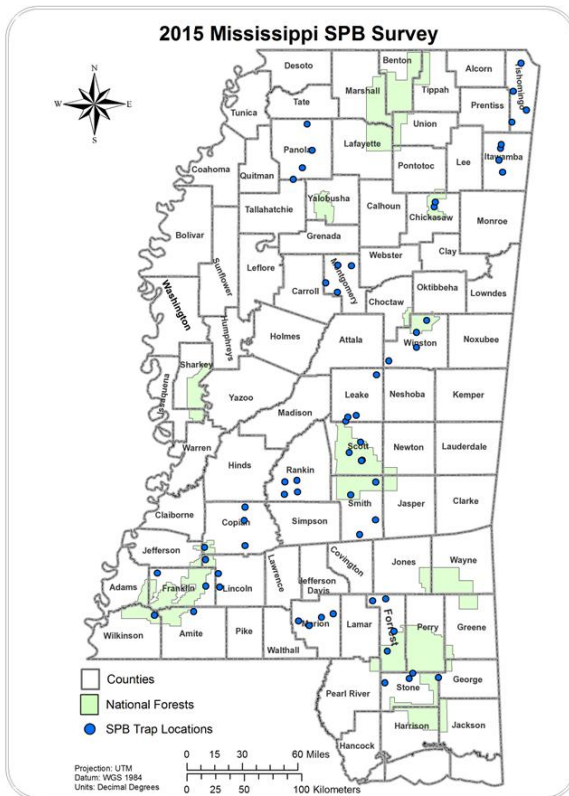


Figure 4: Mississippi spring 2015 southern pine beetle trapping survey locations.

populations and outbreaks should be unlikely during 2015. **However**, an ongoing outbreak of sawfly larvae in Itawamba county warrants increased vigilance for subsequent bark beetle activity on trees stressed by defoliation.

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.

Sothern pine beetle trap captures were relatively low throughout Mississippi this spring. This indicates that high SPB

No state or private lands surveyed by the MFC during 2015 had trap catches that exceeded 30 SPB/day on average, however SPB populations across Mississippi appear to be returning to a more even distribution. SPB were intercepted in more counties during 2015 (16 counties) than in recent years (14 in 2014, 10 in 2013, 7 in 2012, and 5 counties during 2011). 463 individual SPB's were intercepted in MFC traps (not including USFS traps on Federal lands) during the 2015, vs 578 in 2014, 6,113 in 2013, 149 in 2012, and 579 in 2011. Overall, the number of SPB captured over the last few years seems to be subsiding.



Figure 5: The checkered clerid beetle, *Thanasimus dubius*, the most important predator of the southern pine beetle.

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.

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.

We appreciate Dr. Ronald Billings of the Texas Forest Service (979-458-6650, or 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 2015. All southern pine beetle traps in Mississippi had low capture rates, indicating SPB statewide SPB activity should be low in 2015.

	County/National Forest	# Traps	# SPB	# Clerids	% SPB	SPB/Trap/Day	Clerids/Day	Prediction
USDA Forest Service Trapping	Bienville NF	4	208	424	33	2.5	5	Declining or Low
	Chickasawhay RD	4	0	411	0	0	4.9	Declining or Low
	De Soto NF	4	0	89	0	0	1.1	Declining or Low
	Holly Springs	4	118	399	23	1.4	4.8	Declining or Low
	Homochitto NF ¹	8	267	2134	11	1.5	12.3	Declining or Low
	Tombigbee NF	4	29	1033	3	0.3	11.9	Declining or Low
Mississippi Forestry Commission Trapping	Amite	1	165	433	28	5.9	15.5	Declining or Low
	Chickasaw	2	20	1094	2	0.4	19.5	Declining or Low
	Copiah	3	45	112	29	0.4	1	Declining or Low
	Forrest	3	1	269	0	0	2.4	Declining or Low
	Franklin	2	15	801	2	0.3	14.3	Declining or Low
	Itawamba	4	3	606	0	0	5.4	Declining or Low
	Leake	4	9	424	2	0.1	3.8	Declining or Low
	Lincoln	4	27	374	7	0.2	3.2	Declining or Low
	Marion	4	1	37	3	0	0.3	Declining or Low
	Montgomery	4	0	308	0	0	2.8	Declining or Low
	Panola	4	0	127	0	0	1.1	Declining or Low
	Rankin	4	12	120	9	0.1	1.1	Declining or Low
	Scott	4	1	124	1	0	1.1	Declining or Low
	Smith	4	77	793	9	0.7	7.1	Declining or Low
	Stone	4	6	112	5	0.1	1	Declining or Low
	Tishomingo	4	42	868	5	0.4	7.8	Declining or Low
	Wilkinson	1	4	126	3	0.1	4.5	Declining or Low
	Winston	4	35	897	4	0.3	8	Declining or Low
Statewide	-	1085	12115	8.0	0.5	5.2	Declining or Low	
2015 Lures = Sirex lure (70% α-pinene, 30% β-pinene) and 2 frontalinal capsules used on all traps								
¹ USDA Forest Service Traps on Homochitto National Forest were sampled for 8 weeks (instead of 4)								