



Mississippi Southern Pine Beetle Predictions

By Dr. John J. Riggins.

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, declining) and levels (low, moderate, high, 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 a good indicator for the primary

dispersal season for the destructive SPB as well as their primary predators. This year, surveys were conducted by the Mississippi Forestry Commission (MFC) in the following counties: Carroll, Copiah, Forrest, Itawamba, Leake, Lincoln, Marion, Panola, Rankin, Scott, Smith, Stone, Tishomingo, and Winston ([Fig. 4](#)). Three traps were placed in each of the above counties, and the contents of each trap were collected weekly for four weeks. Additionally, special trapping was conducted in Amite, Copiah, Franklin, Lincoln, and Wilkinson counties because of an ongoing SPB outbreak on Homochitto National Forest.

The numbers of SPB and their primary predator, the checkered clerid beetle (*Thanasimus dubius*, [Fig. 5](#)), were identified 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 the checkered clerid beetles into account because they are so 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](#). In general, 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 in southern states. 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.

Landowners near Homochitto National Forest, especially those in Amite, Copiah, Franklin, Lincoln, and Wilkinson counties, as well as landowners near Bienville and Tombigbee National Forest, especially those in Scott and Smith counties, should keep a close eye out for SPB infestations this year.

Although no state or private

lands surveyed by the MFC during 2013 had trap catches that exceeded 30 SPB/day on average, the numbers in those counties indicate building populations of SPB ([Table 1](#)). SPB were trapped in 10 counties this year, as compared to 7 counties surveyed by the MFC during 2012. SPB was only intercepted in 5 counties during 2011. In 2013, 5,325 SPB were captured during MFC's survey, which is a dramatic increase over 149 total SPB captures in 2012 and 579 in 2011. None of the counties surveyed by MFC averaged more than 30 SPB/week this year. However, the dramatic increase in SPB interceptions and relatively low percentage of clerid beetle interceptions in counties adjacent to Homochitto National Forest as well as Scott and Smith counties near Bienville National Forest warrant some concern. All other counties surveyed by MFC are predicted to have static or declining SPB population growth and none or very few infestations.

Overall, SPB numbers are low in many areas of the State, but a few counties (especially those near Homochitto, Tombigbee, and Bienville National Forests) may experience increasing numbers of SPB infestations

during 2013. State trapping near Tombigbee National Forest didn't reveal elevated numbers of SPB, but USDA Forest Service trapping on Federal lands in the Tombigbee indicates a dramatic increase in SPB populations this year. Landowners and forest managers near Tombigbee should also pay extra attention to their stands in the coming year.

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.

If populations of SPB continue to rise in Mississippi, it will become critical for private landowners to walk over your property or have it surveyed to detect any signs of early buildup of damaging agents. SPB can be very destructive and can cause significant financial loss in a short period of time.

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 of which portions have been included here. 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, and Dr. Jim Meeker with the USDA Forest Service, Forest Health Protection in Pineville, LA for providing SPB monitoring data for National Forests in Mississippi.

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

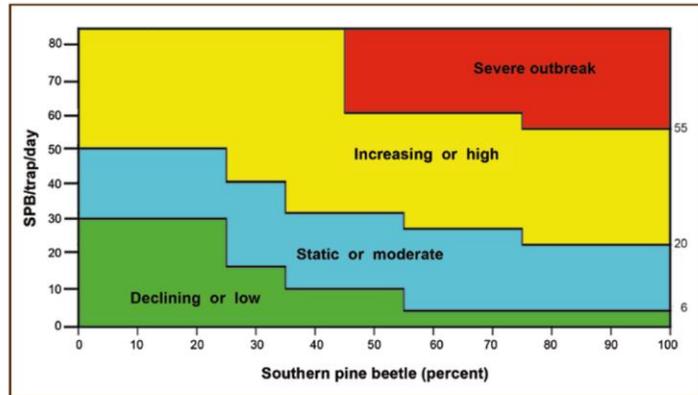


Figure 2: The annual regional SPB prediction relies on this system to predict SPB severity during the survey year, and is based on the number of SPB captured per trap per day, and the percent SPB (vs. their major predator, the checkered clerid beetle) per trap per day. *From:* Billings, R. F. and W.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



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

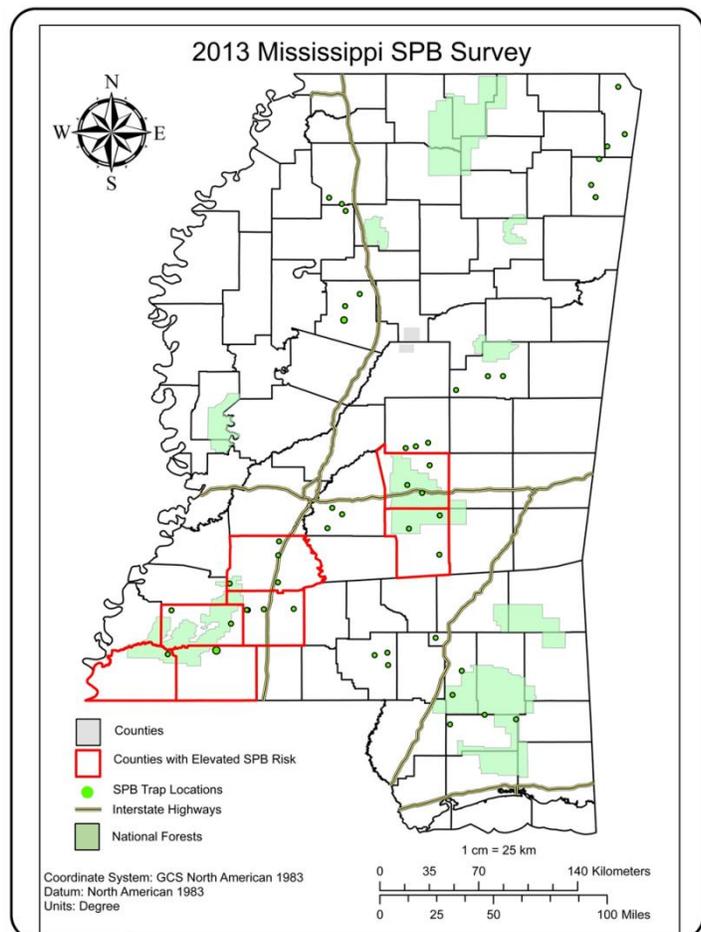


Figure 4: Mississippi spring 2013 southern pine beetle trapping survey locations.



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

Table 1: Mississippi Southern Pine Beetle Spring Survey Summary Results for 2013. SPB populations and infestations in seven counties in the vicinity of Bienville and Homochitto National Forests and Tombigbee Ranger District are expected to increase.

	County	# of Traps	Number SPB	Number Clerids	Percent SPB	SPB/trap/day	Clerids/trap/day	³ Prediction
USDA Forest Service Trapping	Bienville N.F.	3	2,022	1,346	60%	24.1	16.0	I/H
	Chickasawhay R.D.	3	0	607	0%	0.0	7.2	S/L
	Desoto N. F.	3	0	1,018	0%	0.0	12.1	S/L
	Holly Springs R.D.	3	48	1,697	3%	0.6	20.2	S/L
	¹ Homochitto N.F.	3	12,908	4,277	76%	76.8	25.5	I/H
	Tombigbee R. D.	3	4,310	1,303	77%	51.3	15.5	I/H
Mississippi Forestry Commission Trapping	Carroll	3	0	1,350	0%	0.0	16.1	S/L
	Copiah	3	339	911	27%	3.2	8.7	S/L
	Forrest	3	0	257	0%	0.0	3.0	S/L
	Itawamba	3	0	497	0%	0.0	5.9	S/L
	Leake	3	154	1,356	10%	1.8	15.6	S/L
	Lincoln	3	476	600	44%	3.9	5.0	S/L
	Marion	3	0	78	0%	0.0	0.7	S/L
	² Panola	2	0	323	0%	0.0	5.8	S/L
	Rankin	3	1	710	0%	0.0	9.2	S/L
	Scott	3	1,387	588	71%	16.5	6.6	I/M
	Smith	3	1,573	1,197	57%	18.7	14.3	I/M
	Stone	3	0	107	0%	0.0	1.2	S/L
	² Tallahatchie	1	0	29	0%	0.0	4.1	S/L
	Tishomingo	3	234	818	22%	2.8	9.7	S/L
Winston	3	24	805	3%	0.3	9.3	S/L	
MFC Special Homochitto Trapping	Amite	1	204	132	61%	7.3	4.7	I/M
	Copiah	1	332	444	43%	11.9	15.9	I/M
	Franklin	2	780	921	46%	13.9	16.4	I/M
	Lincoln	1	456	428	52%	16.3	15.3	I/M
	Wilkinson	1	153	563	21%	5.5	20.1	I/M
	Average	-	-	977.0	860.1	26%	9.8	10.9

2013 Lures = Sirex lure (70% α-pinene, 30% β-pinene) and 2 frontalinal capsules used on all traps

¹USDA Forest Service Traps on Homochitto National Forest were sampled for 8 weeks (instead of 4) and had standard lures as well as endo-brevicomin lures. Both factors inflate trap captures.

²Two traps were installed in Panola county, and one trap was installed just inside Tallahatchie county along its border with Panola county. The Tallahatchie county trap was stolen after 1 week.

³D=Declining, S=Static, I=Increasing, L=Low, M=Moderate, H=High, O=Outbreak