



Southern Pine Beetle Populations in North Mississippi Continue To Escalate

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Southern Pine Beetle (SPB) populations and associated spot infestations escalated to severe outbreak levels on the Trace Unit of the Tombigbee National Forest by the close of 2013. The Trace Unit contains approximately 15,000 acres of susceptible host type, and the 107 spots reported in 2013 translates to more than seven spots per 1,000 acres of host type. This is substantially higher than the level of activity on the Homochitto National Forest during their severe outbreak in 2012, which yielded ca. 800 spot infestations (4.6 spots/1,000 ac), affecting more than 1,500 acres. The most recent aerial detection flight from mid-September 2013 revealed 36 new infestations. Winter detection flights are generally not conducted because spots are more difficult to detect and the relatively disorganized, due to the scattered and typically limited nature of beetle infestations during the fall/winter season. Initial spot detection flights for 2014 will not occur until June, following crown-fading of new spots that form after

the springtime dispersal season (March – June). However, District personnel have been detecting and reporting new areas of beetle activity over the course of the winter months, despite it being a time when beetles tend to be least active and most difficult to detect.

New SPB infestations reported during the winter of 2013-14 prompted a field evaluation in early 2014 by USDA Forest Service Forest Health Protection Entomologists. Additional goals were to assess winter SPB mortality from the relatively harsh winter experienced in the area during the 2013-14 winter months. The evaluation team consisted of personnel from Region 8-Forest Health Protection (Jim Meeker, Wood Johnson and Billy Bruce), Southern Research Station-RWU-4552 (Erich Vallery and Chris Young), and the Tombigbee National Forest (Chip Gann). The evaluation was conducted on February 18-20.

Over 100 separate infestations have been documented on the Trace Unit so far during 2014, including 89 infestations carried over from 2013 and 19

'new' infestations detected since the first of the year. At present, 90 spots are active (only 14 have gone inactive since last year). Of these, 56 are designated for suppression. Over the course of the February, 2014 visit, 18 separate infestations (11 old and 7 'new') were examined. These infestations ranged in distribution from the north end of the Unit near Davis Lake, to the south end near Houston. Of these infestations, 16 (89%) were still active, as evidenced by the presence of one or more trees exhibiting woodpecker debarking (woodpeckers are natural enemies of SPB, and their foraging activities are easily recognized on winter brood trees, and indicate the presence of overwintering SPB populations) and viable SPB brood in the outer bark (Figures 1 and 2). In general, the majority of these active spots did not show any signs or symptoms of recent, rapid or abundant spot growth over the winter. However, one of these infestations had grown beyond the previously observed (Fall 2013) infestation perimeter by an additional 24 trees, most of which were active brood trees based on the presence of

recent woodpecker activity and fading and or still-green crowns. At least two of these active infestations contained clusters of viable brood trees at two separate locations or spot heads.

Due to the relative severity of 2013-2014 winter weather, it was hoped that overwintering SPB populations might be negatively impacted. The average minimum daily temperatures (in °F) recorded for Station 'Highway 41' (located near the Trace Unit), for the period of November 1, 2013 through February 24, 2014, is depicted in Figure 3. Not only were there numerous and extended subfreezing events during the period, but on 3 separate occasions temperatures dipped down into the single digits on one or more consecutive days/nights, reaching a minimum low temperature of 4 °F as recently as January 29, 2014. With the abundant woodpecker activity (evident on many winter brood trees) creating avenues for air and moisture to get into the inner bark, coupled with the numerous freeze events of this past winter, some beetle mortality was expected. Field examination of brood trees did indeed reveal some brood mortality to late-instar larvae, pupae and callow adults, in places (Figure 4 & 5). In general, dead and discolored brood was found close to the

inner bark of brood trees that were older, needleless, with extremely loose bark and extensive woodpecker activity. Unfortunately, despite the evidence of brood mortality observed in bark samples from a couple of trees at some of the spots examined, there was also evidence of viable brood in other trees at these same spots. It appears that winter weather will not cause a complete collapse of the outbreak at this time, but likely contributed to at least some setback in population numbers.

All of the seven 'new' spots examined (i.e., spots detected in 2014) appeared to have originated in 2013 and escaped prior detection either as a result of being lost in the abundance of new spots detected on the final aerial survey flight in September 2013, or the delayed manifestation of crown fading having occurred following the flight. Unfortunately, some of these 'new' spots have affected more than an acre of forest and one appeared to be approx. 10 acres in size and was still active.

The explosive nature of SPB exhibited on portions of the National Forest in Mississippi (NFMS) in 2012 and 2013 should serve as a constant reminder that SPB problems can rapidly escalate in a single season. Though the majority

of this article focuses on the Trace Unit of the Tombigbee National Forest, all of the pine Forests/Districts of the National Forests of Mississippi have large acreages of moderate to high hazard host for SPB, capable of supporting an outbreak at any time. Pine forest stakeholders throughout Mississippi should pay particular attention to signs and symptoms of southern pine beetle infestations (a good overview of SPB signs and symptoms is available here <http://naldc.nal.usda.gov/download/CAT87208970/PDF>) during the coming year and report suspected activity to your Mississippi Forestry Commission Local Office.

For additional information contact:

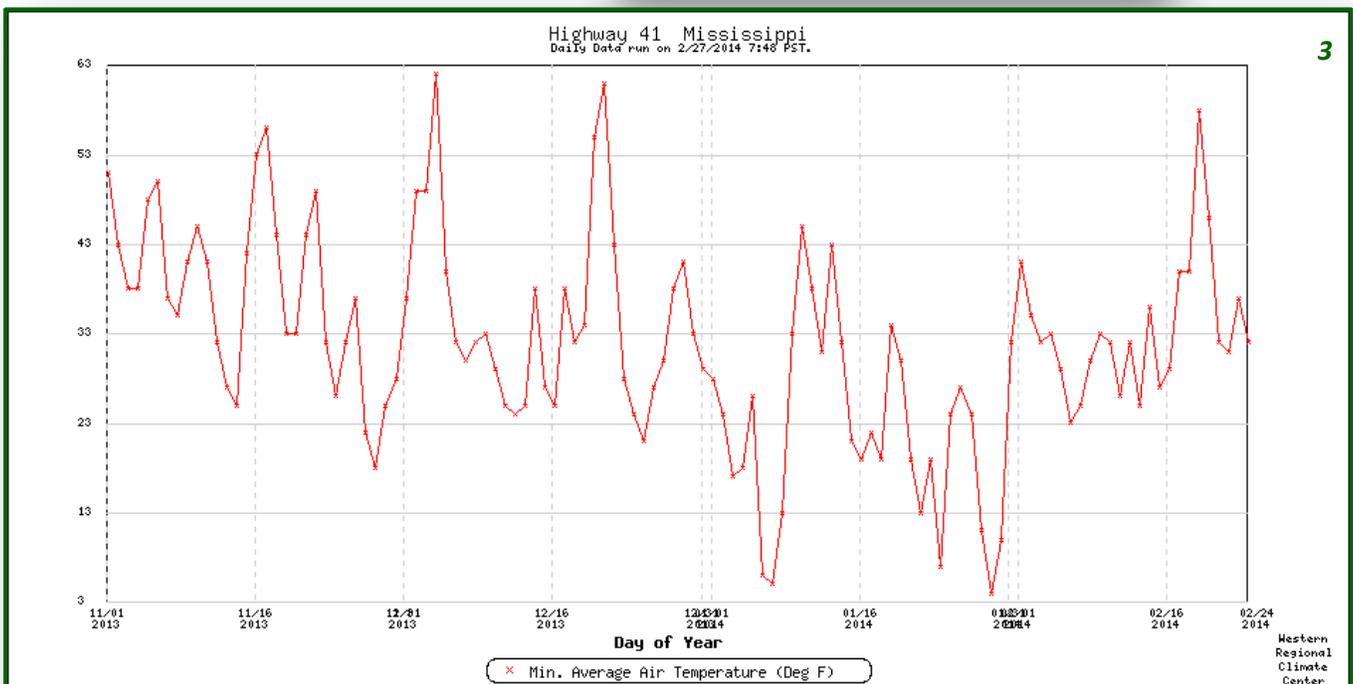
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Figure 1: An example of relatively recent woodpecker activity (winter 2013-14) on SPB infested trees on the Trace Unit of the Tombigbee, February 18, 2014, indicative of successful brood trees likely to produce emerging and attacking adult beetles this spring. Photo by: Erich Vallery

Figure 2: An example of successful SPB brood (e.g., late-instar larvae, pupae and callow adults) located in the outer bark of infested trees on the Trace Unit of the Tombigbee February 18-20. Photo by: Erich Vallery.

Figure 3: Minimum Average Air Temperature from RAWS Weather Station "Highway (Latitude: 41° 34' 05" 25", Longitude: 88° 51' 53") located near the Trace Unit of the Tombigbee, for the period November 1, 2013 through February 24, 2014.





Figures 4 (top) & 5 (bottom). Examples of brood mortality observed in bark of some SPB brood trees on The Trace Unit of the Tombigbee on February 18-20, 2014. Note darkened, discolored, and shriveled nature of late-instar larvae located in inner bark. Photos by: Erich Vallery.