The Georgia Forestry Commission (GFC) participates annually in the southern pine beetle (SPB) prediction trapping program. The southern pine beetle is the most destructive forest pest in the southeastern states. Survey results are documented in an annual report so that activity and damage levels can be anticipated and mitigated.

The Georgia Forestry Commission follows the SPB Prediction Trapping protocol set up by Texas A&M. A 12-funnel Lindgren trap is baited with a three lure system: Frontalin, Sirex and the endo-brevicomin, flexlure (Figure 1). Traps are placed in the field to coincide with redbud bloom (around the first of March in the southern part of the state and mid-March in the northern part of the state). The Georgia Forestry Commission placed 47 traps across the state in 40 counties and six weekly samples were collected from each trap. The number of SPB and clerid beetles (a natural predator of SPB) were counted each week. For 2020, the average number of SPB per trap per day was 3.7 (see map below). This number is considered very low. Four counties, Clay, Haralson, Randolph and Oglethorpe, had SPB per-trap per-day counts greater than 10 but fewer than 20. These counties are in the low range for SPB per trap per day. Quitman County had the highest overall SPB per-trap per-day at 45.5, placing it in the medium category. The remaining 42 traps had an average of fewer than 10 SPB per-trap per-day.

In 2018, the USDA Forest Service (USFS) and all southeastern state cooperators collaborated with Dartmouth College and Bates College, through the Science and Technology Development Program, (STDP) to develop a new prediction model. They found the two greatest factors in predicting the probability of the area having SPB spots are the number of SPB collected per two-week period in the current year and the number of SPB spots in that county the previous year. This year is the second year GFC is using this model. The results from the 2020 survey predict that overall SPB activity will be low across the state, with only one area having a high probability of any spots (Figure 3). Figure 3 shows the probability of a county that had a trap having any SPB spots this year. Across the state, the probability of having any spots ranges from a 0-80%. Rabun County has this highest probability of having spots, at 80%. Camden, Clay, Haralson, Oglethorpe, Quitman, Randolph, Screven and Stephens Counties have the next highest probability of having SPB spots, at 20-40%. The remaining 38 counties with traps had less than 20% chance of having SPB spots.
Another way to present the data is by the probability of a county having greater than 20 SPB spots, shown in Figure 4. These results show Rabun County has a 40% chance, and Quitman County has a 20% chance, of having more than 20 spots. Perhaps a more informative prediction, because it accounts for more variability within the historical data, is the probability of greater than 50 spots in a county (Figure 5). Again, Rabun County has the highest probability of having greater than 50 spots, with a 20% chance. Haralson, Quitman and Stephens Counties have a 10% chance of having greater than 50 spots. The remaining 43 counties that were trapped in 2020 have less than 10% chance of having greater than 50 spots. To put this in perspective, over the last decade, we have only seen the total number of spots statewide rise above 50 three out of ten years.

These prediction models help guide landowners in management decisions. They do not guarantee that outbreaks will or will not occur on their property. The best advice is for landowners to manage for healthy forests with techniques such as thinning, prescribed burning and invasive species control. In the past decade, SPB outbreaks have been limited to infestations in stands that are either over-stocked or over-mature. Southern pine beetle favors pine stands that are over-crowded and stressed. Georgia Forestry Commission will continue to monitor locations of beetle spots throughout the year. All reported beetle activity will be surveyed and monitored to mitigate damage for landowners. Due to COVID-19 restrictions, typical annual aerial surveys to document and monitor pine beetle activity will be limited due to social distancing requirements. Aerial surveys can be conducted by the GFC Air Operations Division during normal flights and any new possible infestations found from these flights will be investigated using ground survey. All infestations will be reported to landowners, and GFC foresters will work with landowners to limit damage and control infestations.

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Figure 2: Southern Pine Beetle trap locations and the number of SPB caught per day over the six-week period.
Figure 3: Probability of any spots

Southern Pine Beetle Outbreak Prediction Maps: Georgia 2020

The outbreak prediction model is based on a number of predictor variables that were determined to provide the best fit to the data. Most prominent among the driving variables were number of SPB/two week time period, and number of spots last year.

The SPB prediction project is supported by USDA Forest Service; Science and Technology Development Program (STDP)

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Figure 4: Probability of 20 or more spots
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Figure 5: Probability of 50 or more spots