Forest Health Monitoring Program Report July 9, 2021

This report is intended to share information to forest land managers about forest health damages observed by the Arkansas Department of Agriculture, Forestry Division – Forest Health Monitoring Program. Chandler Barton, Forest Health Specialist, conducts aerial survey annually to detect or monitor forest threats. The areas selected in this report may or may not have been ground-checked; please use this information to aid your forest management operations. Please contact me if you require more information or need my assistance.

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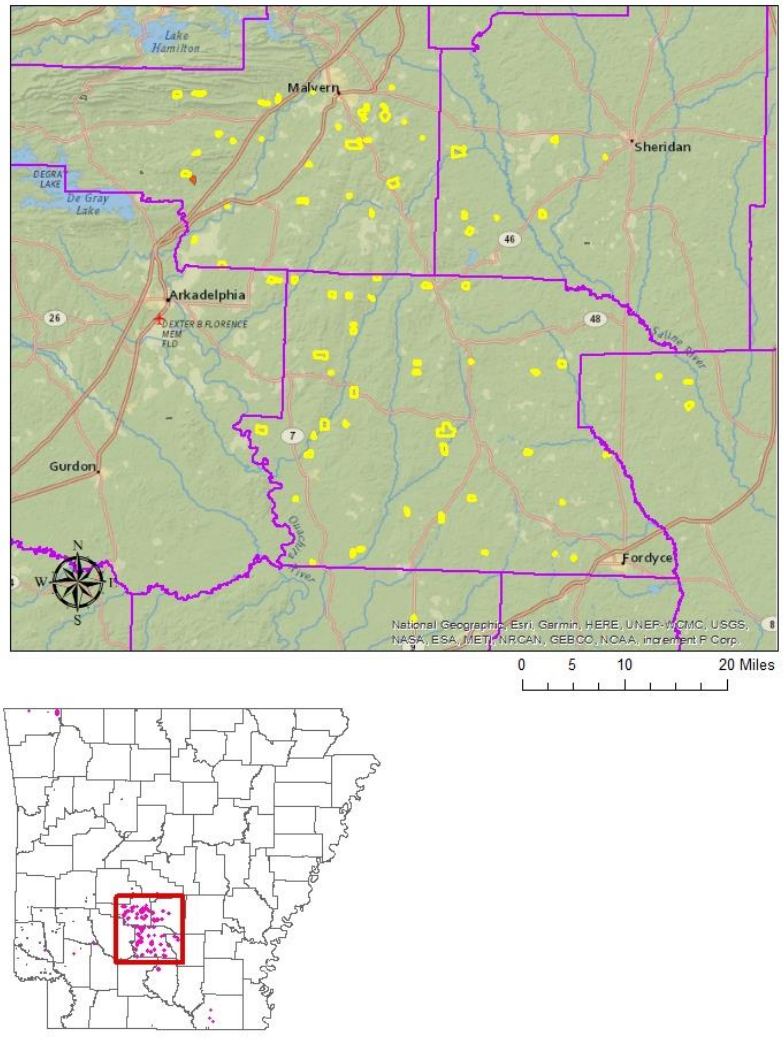
Map of areas with pine mortality. The yellow polygons were recorded during aerial surveys on June 17th and 18th.



Aerial surveys were conducted by Jessica Fuller to investigate reported mortality in pine plantations of Hot Spring and Dallas Counties. The flights occurred on June 17th and 18th. A few of these areas near Malvern Airport in Hot Spring County of were ground-checked on June 24th, 2021. The polygons were mapped with the tablet-based Digital Mobile Sketch-Mapping tool and assigned properties such as damage code and percent forested area affected.

Damage Area in the Map Above
General Description: Hot Springs County (Malvern)
Damage Type: Mortality
Damage Code: Unknown Mortality Loblolly Pine 90000
Host: Loblolly Pine, *Pinus taeda*
Percent of Forested Area Affected: 30% to 50%

The pine plantations mapped during the survey were shown to have scattered mortality with trees showing a red or dull yellow visual signature. Many of the mapped stands were young pine plantation plots, i.e, less than 15 years since planting. Affected trees had evidence of ambrosia beetles, pinhole borers, Ips bark beetles, pine sawyer beetles, and deodar weevils. Within the polygons shown above, a severe mortality rate of 30 to 50 percent was observed. The following images show various signs of bark beetle activity along with the declined appearance of the red trees as seen from the ground.

Figure 1: Adult Ips avulsus galleries with larvae

Figure 2: Pinhole borer sawdust

Figure 3: Declined loblolly pine tree

Figure 4: Bark beetle galleries found on upper trunk

A drone was used to photograph the damage as seen from above; the following image demonstrates the severe mortality extent. Also, many trees can be observed with an unhealthy dull yellow color, appearing to decline from the bottom-up.

Preliminary Conclusions

The various stages of decline observed on the trees indicate the disturbance is ongoing and has occurred for an extended length of time, e.g. early 2021. The pale yellow signature seen in the drone image above is a good indication of foliar pathogen infection. Needlecast fungi, such as *Lophodermium* sp., may have contributed to the decline. Leaf samples were collected and sent to forest pathologists, who will determine if any other foliar pathogens may be to blame. Brown spot needle blight, *Lecanostica acicola*, was confirmed recently on loblolly pine across the state, and it may be a contributing factor in this mortality event. These foliar pathogens would be worsened by frequent rainfall. Another reason for the abrupt stand decline may also be abiotic conditions, e.g., excess soil moisture, periods of short drought, and unknown soil deficiencies. Winter and spring of 2021 was abnormally wet, thus having the potential to cause adverse soil conditions for loblolly pine growth. Genetic predisposition may also be a factor in this decline which is isolated at the stand level.

Some sites were ground checked and two main contributing factors of mortality could be attributed to either deodar weevil, *Pissodes nemorensis,* or Ips pine bark beetles. The presence of Ips pine engraver beetles could simply be a secondary result of the stressed, diseased host. Landowners should monitor for Ips infestations closely, but if deodar weevil is the only contributing factor, then no action would be necessary. As mortality exceeds 30% with Ips pine bark beetles, removal of this susceptible stand would be a reasonable decision to prevent future losses. Chandler Barton, Forest Health Specialist, will be investigating the locations more closely to see if any other observations can help us reach a more confident conclusion.