USDA United States Department of Agriculture

e-Science Update SRS–108

Status of Ash (*Fraxinus* spp.) Species in Alabama, Arkansas, Mississippi, and Louisiana, 2013

Overview

The emerald ash borer (EAB; *Agrilus planipennis*) is an introduced Asian beetle species that was first detected in trees in the *Fraxinus* (ash) genus in the United States in 2002. Female EAB beetles lay between 40 to 70 eggs in cracks, crevices, and beneath bark flakes. The eggs hatch within about 2 weeks, larvae bore through the outer bark, and begin eating the inner cambium of the wood. As larvae carve galleries through the cambium, they effectively disrupt the ability of the tree to transport water and nutrients. The larvae eventually girdle the tree, resulting in canopy decline and death of tree branches and, ultimately, tree mortality.

EAB was detected in Michigan as early as 2002 (Herms and McCullough 2014), and has since spread throughout the Northeastern United States and into the Southern States of Arkansas, Kentucky, Tennessee, Georgia, North Carolina, and Virginia, and as far west as Colorado) (fig. 1). Some impacted stands of ash have experienced up to 99 percent mortality as a result of beetle infestation, impacting not only the ecology of the stand, but the economy of infested States, as well.

Current locations of EAB infestations suggest that it is likely that the beetle will eventually infest stands in Alabama, Mississippi, and Louisiana. This update provides information on the current status and distribution of ash species in those States, along with newly infested Arkansas. To date, management and prevention of EAB includes restrictions on firewood transport, biological control, insecticidal control, and integrated management.

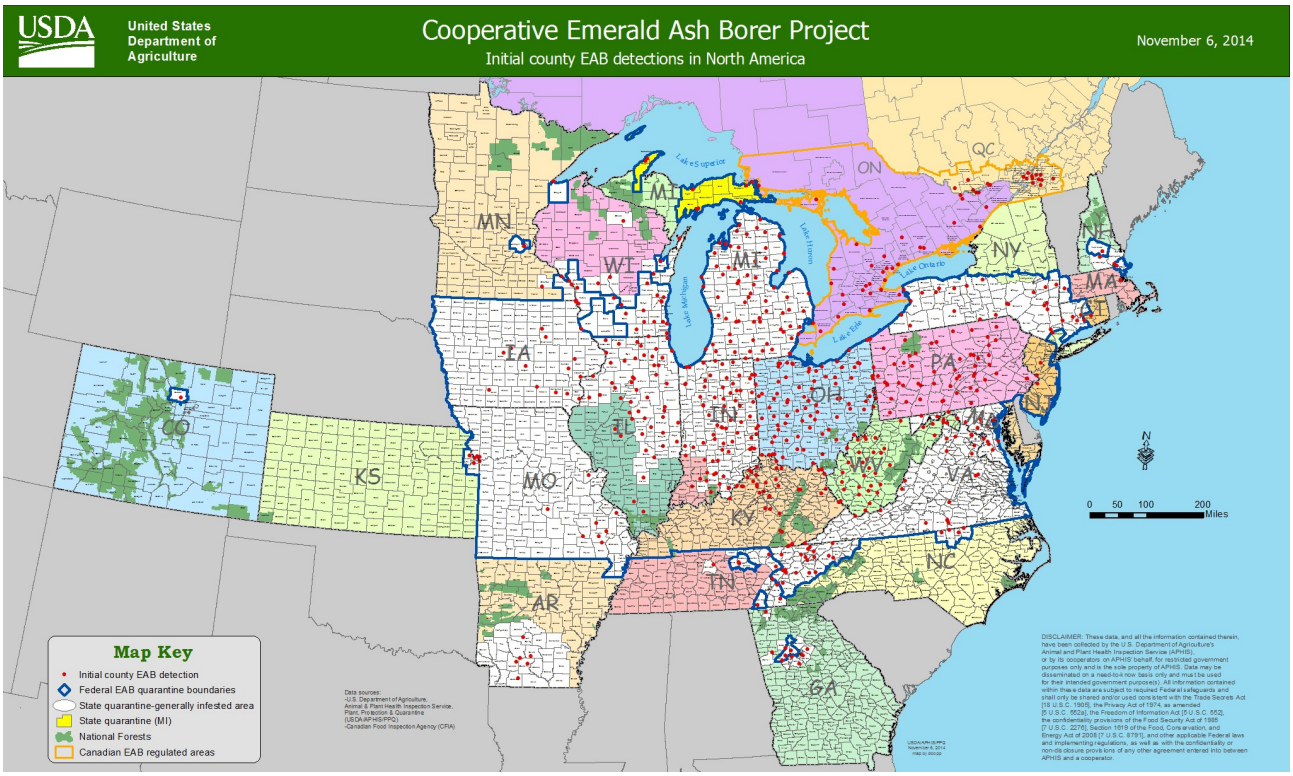

Figure 1—Estimated infestations of EAB. Map from the Cooperative EAB Project, U.S. Department of Agriculture Forest Service and cooperators. Available online at www.emeraldashborer.info.

Ash in Alabama

There are an estimated 224 million ash trees >1 inch diameter at breast height (d.b.h.) in Alabama (fig. 2). Ash species make up 1 percent of the species in the State. Ash occurs predominately in the oak-hickory, loblolly-shortleaf, oak-gum-cypress, and elm-ash-cottonwood forest-type groups. In terms of number of live trees, ash is fairly evenly distributed through the Southeast, Southwest-North, North, and West survey units in Alabama. Lowest numbers of ash trees occur in the Southwest-South unit and the North Central unit. Seventy-two percent of ash trees are <3 inches in d.b.h.

Ash species contribute an estimated 438 million cubic feet of all -live volume and 1 billion board feet of sawtimber on forest land. While the number of ash trees is spread throughout the survey units in Alabama, the volume of ash is highest in the North, Southwest-North, and Southeast units (fig. 3). The majority (89 percent) of volume is on privately owned land.

Net annual growth (growth minus mortality) on ash trees on forest land in Alabama was 12 million cubic feet, on average, while annual mortality was 7 million cubic feet on average. Average annual removals equaled 9 million cubic feet in 2013.

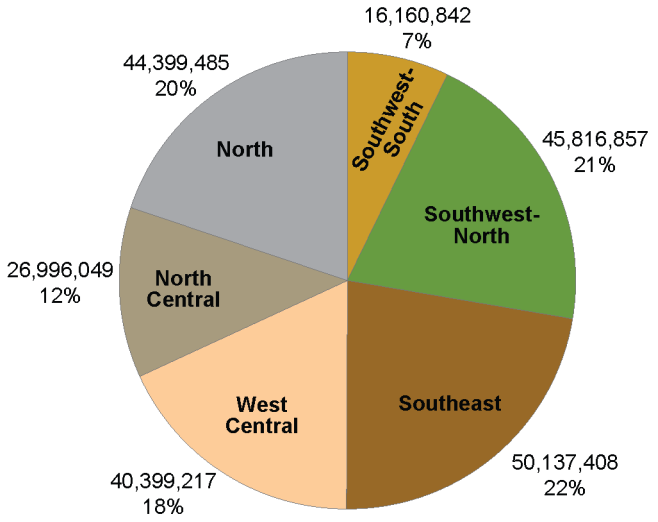

Figure 2—Number and percent of live ash trees (at least 1 inch d.b.h.) on forest land in Alabama by survey unit, 2013.

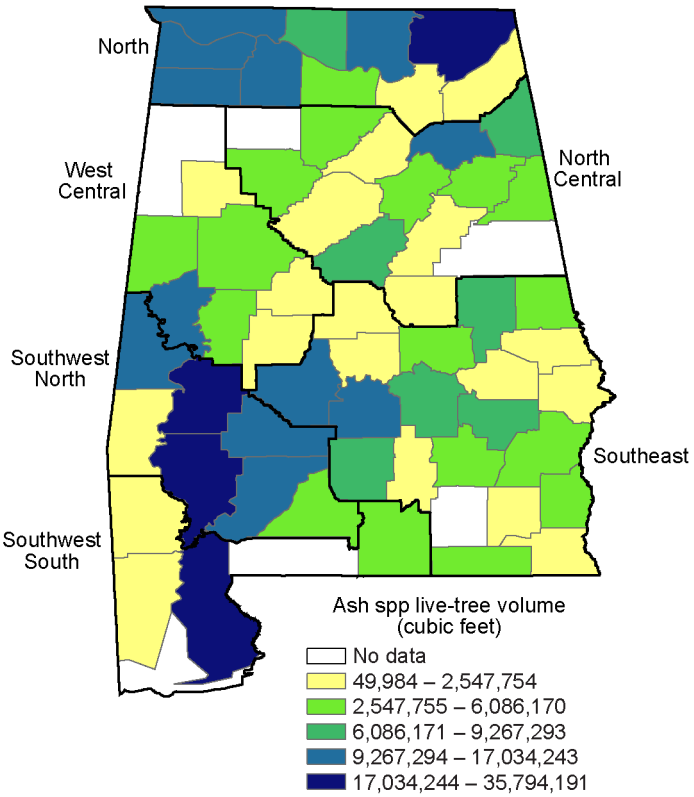

Figure 3—Live-tree ash volume on forest land by survey unit and county, Alabama, 2013.

Ash trees killed by emerald ash borer in a floodplain in Ohio. (photo by Kathleen Knight, U.S. Forest Service)

Ash in Arkansas

EAB was detected on Arkansas forest land in six counties in southwest Arkansas in summer, 2014, suggesting that the ash population in Arkansas may be impacted by the beetle in the near future.

There are an estimated 294 million ash trees (all *Fraxinus* spp., combined) >1 inch d.b.h. in Arkansas. Ash species make up 3 percent of all species in the State and 3 percent of the hardwood species in the State. Thirty-nine percent of ash trees are in bottomland hardwood forest-type groups (oak-gum-cypress and elm-ash-cottonwood), while 37 percent are in the oak-hickory forest-type group. The largest number of ash trees (36 percent) occurs in the southwest survey unit, followed by the Ozark unit (28 percent, fig. 4). Sixty-five percent of ash trees are <3 inches d.b.h.

Ash species contribute an estimated 631 million cubic feet of all-live volume and 1.7 billion board feet of sawtimber volume on forest land. Ash volume is spread throughout Arkansas' survey units, with the lowest volume in the Ouachita unit (fig. 5). The majority (68 percent) of volume is on privately owned land (fig. 6).

Net annual growth (growth minus mortality) on ash trees on forest land in Arkansas was 12 million cubic feet, on average, while annual mortality was 10 million cubic feet on average. Average annual removals equaled 5 million cubic feet in 2013.

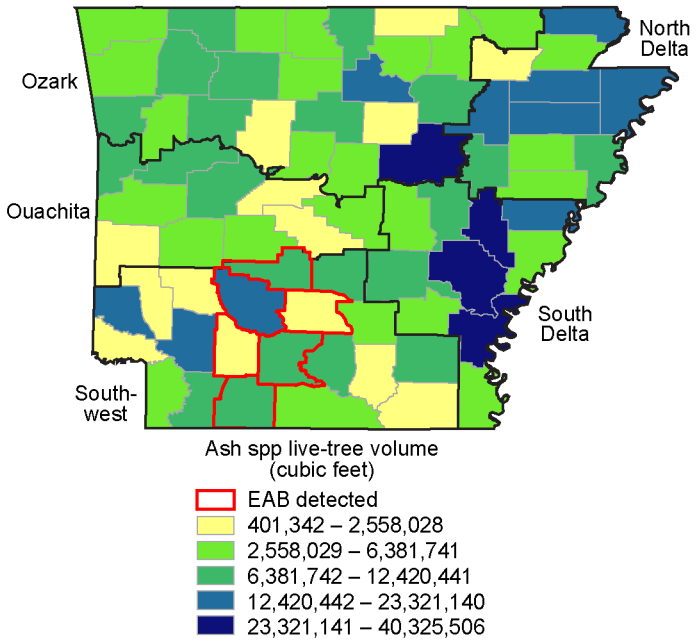

Figure 5—Live-tree ash volume on forest land by survey unit and county, Arkansas, 2013. Emerald ash borer has been detected in counties outlined in red.

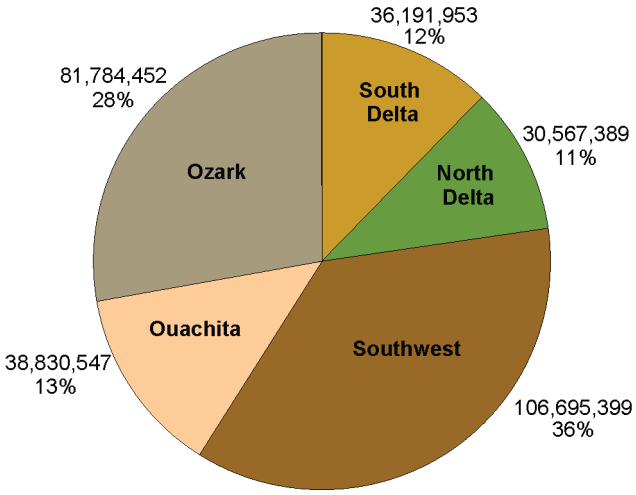

Figure 4—Number and percent of live ash trees (at least 1 inch d.b.h.) on forest land by survey unit, Arkansas, 2013.

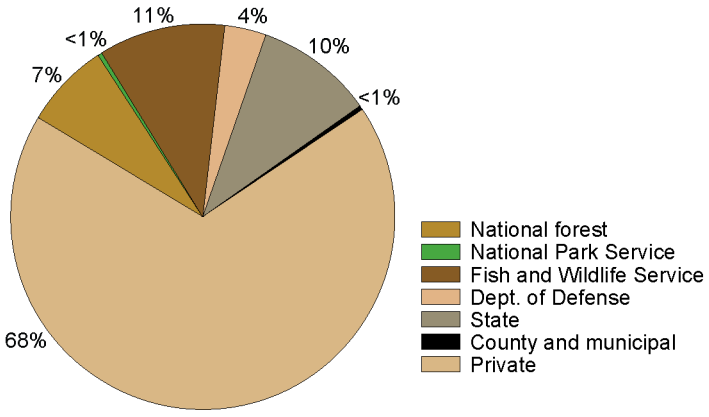

Figure 6—Ownership of live ash volume in Arkansas, 2013.

Ash in Mississippi

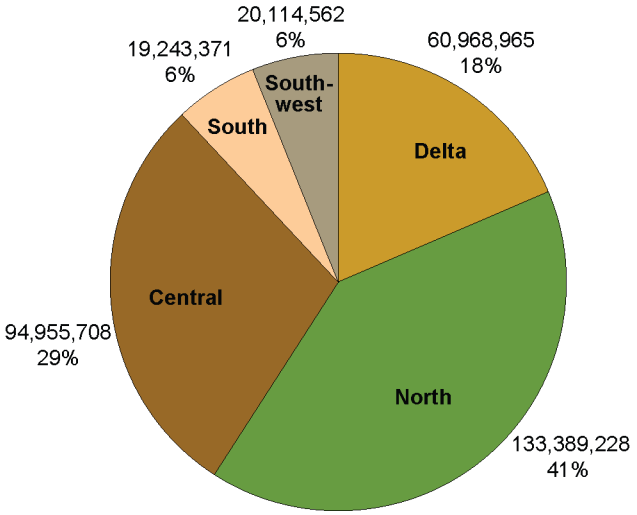

Figure 7—Number and percent of live ash trees (at least 1 inch d.b.h.) on forest land in Mississippi by survey unit, 2013.

There are an estimated 329 million trees in the *Fraxinus* genus in Mississippi. Ash species make up about 2 percent of all-live trees in the State, and 3 percent of all hardwood trees. The largest number of ash trees occurs in the North survey unit of Mississippi, followed by the Central and Delta units (fig. 7). Seventy-one percent of ash trees are <3 inches d.b.h. Another 17 percent are between 3 and 5 inches d.b.h. All but nine counties in the State have at least some ash trees.

Ash species make up 539 million cubic feet of all-live volume and 1.3 billion board feet of sawtimber volume in Mississippi. Most ash volume occurs in bottomland hardwood (oak-gum-cypress or elm-ash-cottonwood) and oak-hickory forest-type groups. The largest volume occurs along the Mississippi River in the Delta survey unit, followed by the North survey unit (fig. 8). Thus, there are larger numbers of ash seedlings in the North and Central units than in the Delta, but there are more large, mature trees in the Delta. Seventy-six percent of ash volume grows on nonindustrial private land in Mississippi.

Net annual growth (growth minus mortality) on ash trees was 19 million cubic feet, on average, while annual mortality was 6 million cubic feet on average. Average annual removals equaled 12 million cubic feet in 2013. According to timber product output (TPO) data, most harvested ash logs sold to mills were used for saw logs or pulpwood and come from nonindustrial private timberland.

Adult emerald ash borer beetle. (photo courtesy of USDA Forest Service)

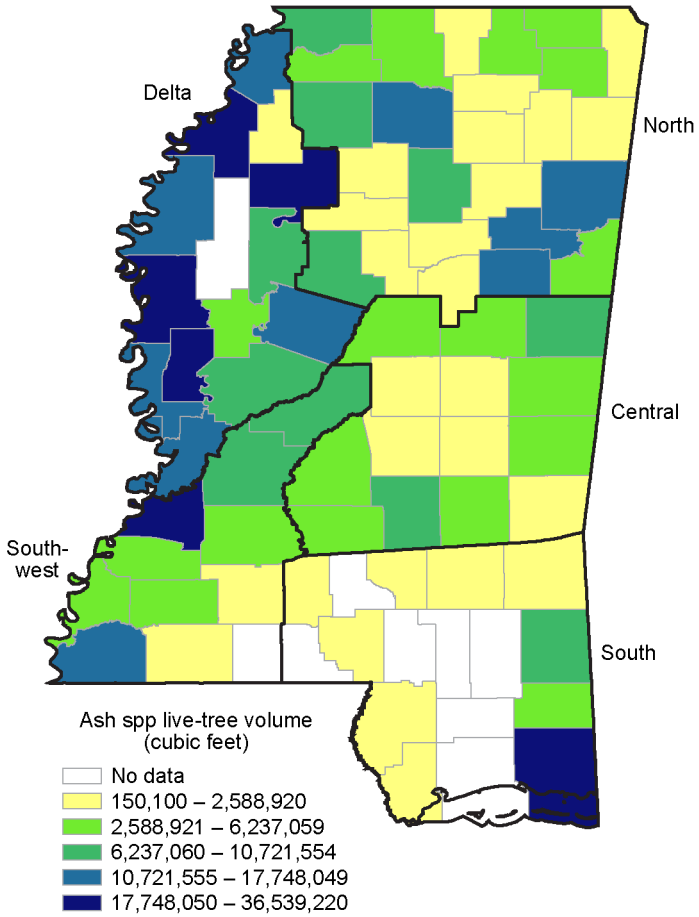

Figure 8—Live-tree ash volume on forest land by survey unit and county, Mississippi, 2013.

Ash in Louisiana

There are an estimated 285 million ash trees >1 inch d.b.h. in Louisiana. Ash species make up 3 percent of the species in the State and 4 percent of the hardwood species in the State. Seventy-six percent of ash trees are in bottomland hardwood forest-type groups (oak-gum-cypress and elm-ash-cottonwood). The largest number of ash trees (62 percent) occurs in the South Delta and Southwest survey units (fig. 9). Seventy-three percent of ash trees are <3 inches d.b.h.

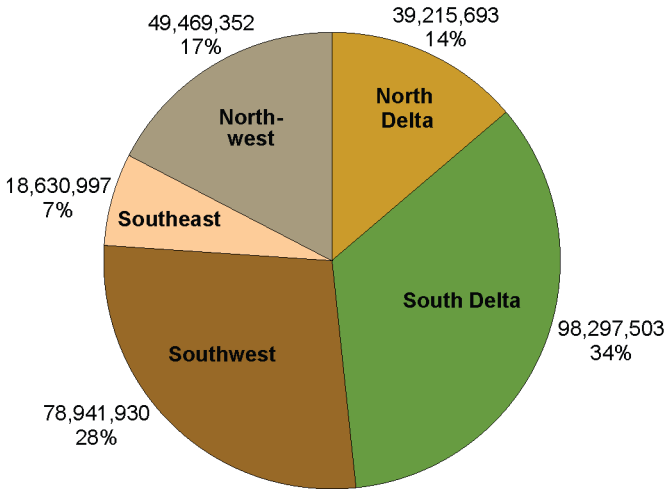

Figure 9—Number and percent of live ash trees (at least 1 inch d.b.h.) on forest land in Louisiana by survey unit, 2013.

Ash species contribute an estimated 613 million cubic feet of all-live volume and 1.7 billion board feet of sawtimber volume on forest land. Sixty-two percent of ash volume occurs in the South Delta survey unit, alone (fig. 10).

Net annual growth (growth minus mortality) on ash trees on Louisiana forest land was 6 million cubic feet, on average, while annual mortality was 12 million cubic feet on average. Average annual removals equaled 6 million cubic feet in 2013. Like

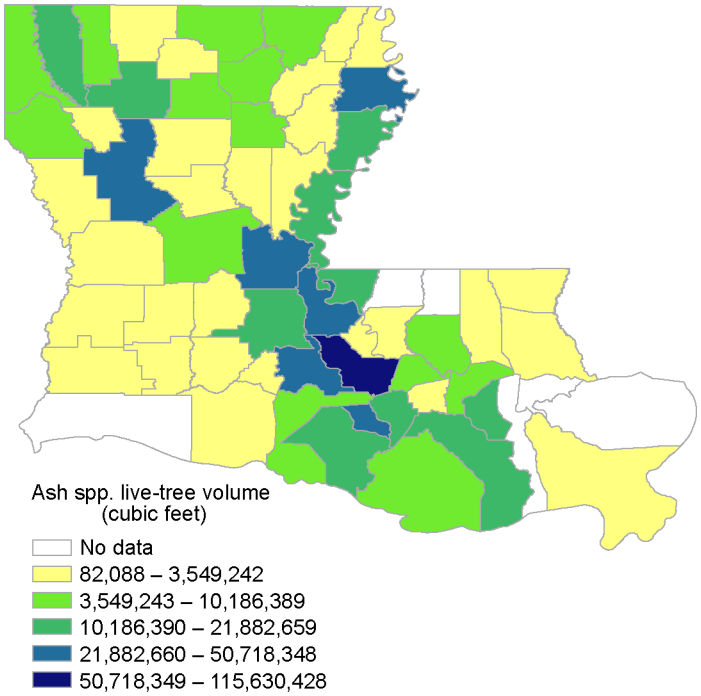

Figure 10—Live-tree ash volume on forest land by county, Louisiana, 2013.

Mississippi, ash removals in Louisiana come primarily from privately owned timberland. Research indicates that small populations of EAB grow together, advancing the invasion front and increasing the overall spread (Herms and McCullough 2014). Assuming no change in the resource, EAB could impact over 2.2 billion cubic feet of ash volume should it infest the States of Alabama, Arkansas, Mississippi, and Louisiana.

Literature Cited

Herms, D.A.; McCullough, D.G. 2014. Emerald ash borer invasion of North America: history, biology, ecology, and management. Annual Review of Entomology. 59:13–30.

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