Delaware - 2021
Forest Health Highlights

The Resource

Delaware's forests presently cover approximately 382,000 acres, roughly one third of the land area in the State. Delaware has experienced a rapid conversion of forests and agricultural lands to residential and other urban uses since the 1980s.

Weather Conditions

Last winter was the 2nd mild winter in a row. The lowest temperatures recorded around the state were only down to about 18 degrees F. There was a period of heavy snows from the end of January to February 18th that saw about 10 to 15 inches of snowfall in most areas. The growing season into early fall has seen 3 short droughty periods so far; May 9th through 26th, July 18th to August 6th, and September 24th to October 10th. A tornado did some tree damage around the Milford and Harrington areas on July 1st.

Forest Insect Issues

Periodical Cicada

The 17-year periodical cicada hatch came this spring as expected. Adult cicadas were first noted around May 19th. Cicadas were only observed in the piedmont portion of northern New Castle County (north of approximately state route 4). The browning of leaves from female egg deposition on some of the tender outer branchlets was quite dramatic. It could be seen on many species of hardwoods about a month after the emergence.

Figure 1. A red oak in northern Delaware on June 30th; with browning leaves on some of the branch tips due to 17-year cicada oviposition damage.

Emerald Ash Borer

The 2021 aerial survey located over 800 acres of ash tree canopy decline due to emerald ash borer (EAB). This damage was located across the piedmont (northern New Castle County) and western sides of all three counties. Infestations probably started at least four years ago (2017), are now showing up as declining ash trees around much of the state. The forests of Delaware overall contain about one percent ash. Some upland forests in the piedmont (with white ash) contain up to about 7 percent ash on a local scale.

Asian Longhorned Beetle (ALB)

ALB is a serious threat to a variety of hardwood species, especially the rural and urban maples throughout Delaware. Trapping begun in 2012 was continued in 2021. Sets of Shantung Maple (*Acer truncatum*) seedlings planted in five New Castle County parks were inspected for ALB signs and symptoms again this year. No ALB was detected.

Sirex woodwasp (Sirex noctilio)

Sirex noctilio presents a threat to loblolly pine, the mainstay of the forest products industry in southern Delaware. In late July 2021, eighteen lindgren traps baited with a sirex blend were hung at nine sites throughout the state. Traps are checked up until hard frosts reduce insect activity late in the year. *Sirex noctilio* has yet to be detected in Delaware.

Southern Pine Beetle

In 2021 Delaware continued to participate in the Annual spring southern pine beetle (SPB) survey in conjunction with southern states. At five sites across Sussex County, Lindgren funnel traps were in place for 6 weeks between April 12 to May 26. Only the Cypress Swamp trap produced a very few adult SPB. This indicated another year of low or declining SPB population, which would mean likely a lower threat level to our pines for next year.

Spotted Lanternfly (SLF)

SLF was first spotted in Wilmington in November of 2017. The Delaware Department of Agriculture Plant Industries section quarantined New Castle County originally, and then as of October 30, 2020 Kent County (just to the south) was added. The Plant Industries section continues to run a task force with grant funds to directly work on control efforts and public education to combat the spread of this new invasive plant hopper.

Other Insects

Pheromone lures and traps for the detection of walnut twig beetle (WTB) set up in six locations in New Castle County are still being sorted at this time, though the spring and early fall catch did not show any WTB once again. This insect has yet to be detected in Delaware. Another *Lymantria dispar dispar* (formerly known as Gypsy Moth) area of defoliation near the Maryland state line in southern Sussex county was discovered in June this year. Fresh layed (June 2021) egg masses of *Lymantria dispar dispar* were discovered

in many parts of Sussex county this summer as well, indicating a potential increase in this non-native defoliator for next year.

Forest Disease Issues

Bacterial Leaf Scorch (BLS)

BLS is common throughout Delaware in red oaks, particularly in urban and suburban trees though it is found in natural forests as well. It appears most damaging to pin oak and northern red oak in developed areas. The Delaware Forest Service put in place three permanent plots in red oak stands in each of our three state forests to study potential effects on natural forests. The remeasurement of the plots in early September of this year showed low levels of visual scorch symptoms as in recent years due to more than adequate rainfall. The loss of two additional co-dominant red oaks at the Redden State Forest plot this year increases the calculated mortality rate per ten years from about 18 % last year to about 20% overall as of 2021's measurement.

Figure 2. A tagged red oak that died about 2 years ago within one of Delaware Forest Service's bacterial leaf scorch plots at Blackbird State Forest.

Other diseases

Leaf infections of bacteria and fungi such as anthracnose were common again this year due to the rainy spring.

Forest Health Monitoring

White oak decline study

In addition to red oak plots for BLS, permanent white oak dominated forest plots were established in 2014 to study the canopy health and mortality rates of mature white oaks. Ten circular plots of 1/5 acre were set up at Blackbird state forest. All oaks were tagged for tracking through the years. In the last two years of tracking (2020 and 2021), four additional codominant white oaks have died (out of 55 original dominant or codominant oaks in all plots). Average canopy dieback was estimated at 8.2 %, versus about 5% to 6% for the last three years.

Figure 3. Chestnut oak seedlings protected from deer browsing behind a deer exclosure study fence at Hoopes Reservoir, northern Delaware.

Beech Bark and Leaf Diseases

With the rapid increase in discovery of beech leaf disease in surrounding states, seven new beech leaf disease permanent study plots were installed at four beech stands across Delaware. Visual symptoms of both beech leaf disease and beech bark disease were searched for on each tree within the one-tenth acre plots. No distinct signs or symptoms of beech leaf or beech bark disease were seen. Leaf samples taken in June were sent to the University of Delaware plant diagnostic lab. All samples were negative for the nematode that is associated with beech leaf disease. Fall bud samples will also be sent in soon.

Aerial Survey

The 2021 aerial survey for forest damage was flown between June 25, 28 and 29. 96 forest damage areas were mapped from the plane, and a subsample of those, mostly upland areas, were checked more closely from the ground to confirm causal agents. Damage agents noted from the plane were Emerald ash borer (849 acres), flooding/high water (499 acres), tornado wind (89 acres), bacterial leaf scorch (22 acres), herbicide-intentional (19 acres), and *Lymantria dispar dispar* (16 acres). The total amount of damage mapped was 1,495 acres.

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