

Florida Forest Service Forest Health Highlights 2021



Forests of Florida

Florida's forests are expansive and diverse and include subtropical systems, baldcypress wetlands, pine flatwoods, pine-oak scrubs, gum-cypress swamps, coastal mangroves, isolated hardwood hammocks, and more extensive upland hardwoods. The state's mild climate, tourism industry, and many ports of entry also make it particularly vulnerable to the introduction and spread of non-native invasive species. Challenges to forest health in the Sunshine State are therefore myriad and complex. What follows are only a small sample of notable examples of Florida's forest pest and disease-related activities and scenarios from 2021.

Forest Health Section

The Florida Forest Service's Forest Health Section maintains an active program that provides a range of technical assistance including pest and identification and diagnosis, management recommendations, training, education, and public outreach. The recipients include but are not limited to University of Florida and the Cooperative Extension Service, The Division of Plant Industry, FFS personnel, the Society of American Foresters, The International Society of Arboriculture, The Florida Forestry Association, Florida A&M University, forest industries, private landowners, and others. Although the COVID-19 pandemic continued to limit in-person meetings, the FH Section offered at least 8 presentations and training seminars in FY 20/21, to approximately 354 attendees. The FFS Forest Health Section staff also provided assistance in the form of identifications, diagnoses, and management recommendations regarding over 622 forest-health-related incidents statewide (Fig. 1).



Figure 1. Locations (where recorded) of Forest Health-related assists performed by FFS Forest Health Section Staff, from October 1, 2020 to September 30, 2021.

Spring Tussock Moth Outbreaks

Reports began to be received in mid-March of heavy outbreaks of fir tussock moth (*Orgyia detrita*) caterpillars near Sarasota. By mid-April, many scattered local outbreaks of this native defoliating pest had been found across a large swath of North-Central Florida (Fig. 2). Residents in these areas were often alarmed by the abundance of the distinctive caterpillars (which have hairs that can cause irritation on contact with skin) and the messy cocoons that they spin on trees, buildings, and other surfaces. Southern live oak (*Quercus virginiana*) was the primary species affected, with trees in some areas experiencing over 90% defoliation. However, no tree mortality was observed as a direct result of the feeding damage, which concluded as the caterpillars completed development and entered the pupal stage (in April-May). Most trees had developed a new flush of leaves by the following month.



Figure 2. Left: Locations of significant outbreaks of fir tussock moth (*Orgyia detrita*) in Spring 2021. Center: Tussock moth caterpillars and cocoons on the bark of a live oak tree. Right: Severely defoliated live oaks near Bushnell, Florida in March 2021.

June Beetle Pine Defoliation

In mid-June 2021, reports were received of severely defoliated slash and loblolly pines in Bay County (Fig. 3). Although initially this was thought to be due to an outbreak of pine sawflies, on-site inspections found that it was from adult feeding by a species of June beetle, *Phyllophaga latifrons*, which local residents reported as having been very abundant in the preceding weeks. This species is native and known to feed on pine needles in the adult stage, but this was the first time it had been recorded causing severe and widespread defoliation in Florida. At least 1,800 acres of natural and planted pines (in all size classes) were defoliated. The affected areas were all adjacent to cattle pastures that likely provided habitat for the larval stage, which feed on the roots of grasses and other herbaceous plants. As this species typically takes 2 years to complete development, the area will be monitored for a resurgence of the pest in spring of 2023. Although this event is unusual, the FFS Forest Health Section's records show that similar outbreaks occurred of another pine-feeding June beetle species, *Polyphylla occidentalis*, in Okaloosa County in 1997 and 1999.



Figure 3. Left: Young loblolly pine plantation defoliated by June beetle adult feeding. Middle: Close-up of feeding damage. Right: Close-up of the June beetle *Phyllophaga latifrons*.

Emerald Ash Borer

In June 2021 at the Palm Beach International Airport, a user of the iNaturalist web service recorded a picture that was clearly identifiable as an adult emerald ash borer (*Agrilus planipennis*, or EAB) (Fig. 4). This non-native woodboring beetle has been devastating populations of native ash trees (*Fraxinus* spp.) as it has spread through the eastern United States for nearly two decades. However, it had never been previously documented as present in Florida. Staff from the Forest Health Section worked with staff from the local FFS field office, USDA-APHIS, and the FDACS Division of Plant industry to look for EAB infestation in ash trees in that area and establish survey traps to detect the presence of the beetle. Currently, no evidence of EAB has been found in nearby ash trees, or in the survey trap collections.



Figure 4. Picture of an emerald ash borer (*Agrilus planipennis*) that was posted to the iNaturalist web service from Palm Beach International Airport. Photo credit: Giff Beaton.

The airline employee who took the picture reported that the beetle was found near a plane that had just arrived from Atlanta, Georgia (where EAB is already established). It's possible that it was a lone individual that had been carried in the plane and does not represent an established population. However, that area will continue to be monitored.

Southern Oak Thelaxid Aphid

In 2019, an aphid species native to Europe, *Thelaxes suberi*, was found in the United States for the first time, infesting oaks in an ornamental nursery in Marion County, Florida. In 2020, a winged adult (alate) of this species was collected in a routine survey trap in Polk County. In April 2021, this species was found infesting established trees in the field, in an urban park in Marion County (Fig. 5). Thus far, it has only been found infesting the new spring growth of trees in the red oak group, including Darlington (*Quercus hemispherica*), Shumard (*Q. shumardii*), and water oak (*Q. nigra*). No significant symptoms or health problems have been observed on the infested trees, but survey and monitoring efforts will continue.



Figure 5. Oak shoots infested with the southern oak thelaxid aphid, *Thelaxes suberi*.

Post-hurricane *Ips* Engraver Beetle Trapping

In the summer of 2019, many reports began to be received regarding pine mortality in the region impacted by Hurricane Michael in October 2018, with associated infestations of *Ips* species. The FFS Forest Health Section began efforts to monitor the distribution and abundance of these bark beetles across the affected region, including a pheromone trapping survey in June-July 2019. This survey found that *Ips* populations were much higher in the region impacted by the hurricane, and that this association extended well outside of the region that sustained catastrophic damage. The trapping survey was repeated in the summers of 2020 and 2021. Preliminary analysis of the results indicates that by the third year after the hurricane, *Ips* populations had subsided to near-background levels across most of the region (Fig. 6). A full report will be produced after analysis of the results is completed.

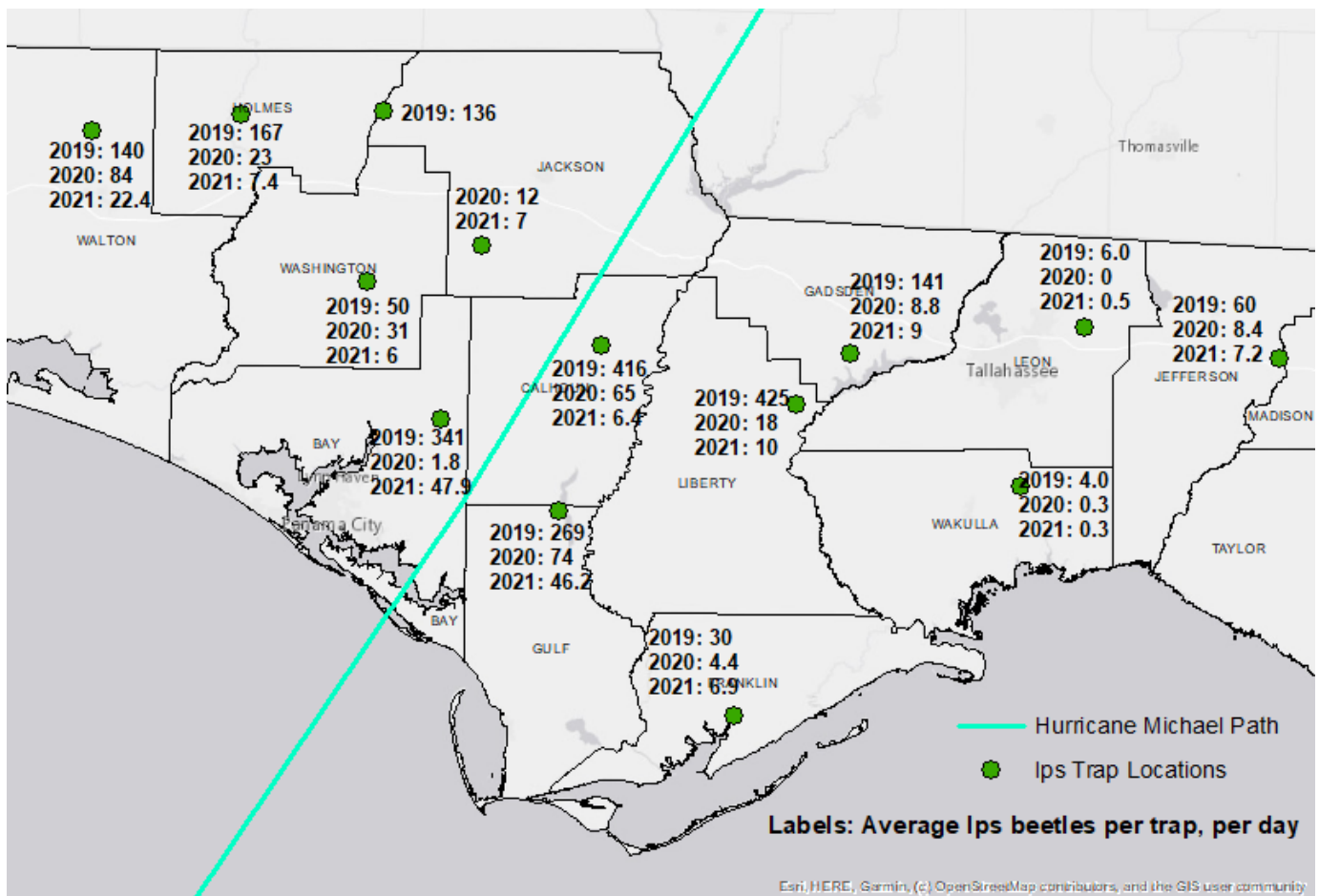


Figure 6. Locations of *Ips* pine engraver beetle pheromone survey traps in the region impacted by Hurricane Michael in 2018. Numbers show the total average *Ips* beetles trapped per day for each collection year.

Southern Pine Beetle Spring Pheromone Trapping Survey

The Southern Pine Beetle is one of the most destructive forest pests in the southern United States. Since 1995, the Florida Forest Service has participated in an annual statewide Southern Pine Beetle (*Dendroctonus frontalis*, or SPB) spring trapping survey. This survey monitors numbers of adult SPBs and their clerid predators captured in pheromone-baited flight traps during the SPB primary spring dispersal phase. The results are used as an early-season prediction of SPB population trends and activity levels, allowing forest managers to identify areas of potential SPB activity in advance of aerial detection flights. The survey also provides data for monitoring SPB population levels from year to year.

The annual survey to monitor SPB population levels was conducted from February to March 2021. Six weekly trap collections were made at 50 locations across 39 counties in North Florida, corresponding to the historical range of SPB in the state (Fig. 7). Low numbers of SPB were collected across all locations surveyed. When these results were used with the regional SPB prediction model, a low risk of SPB activity was forecast for the state (Fig. 8).

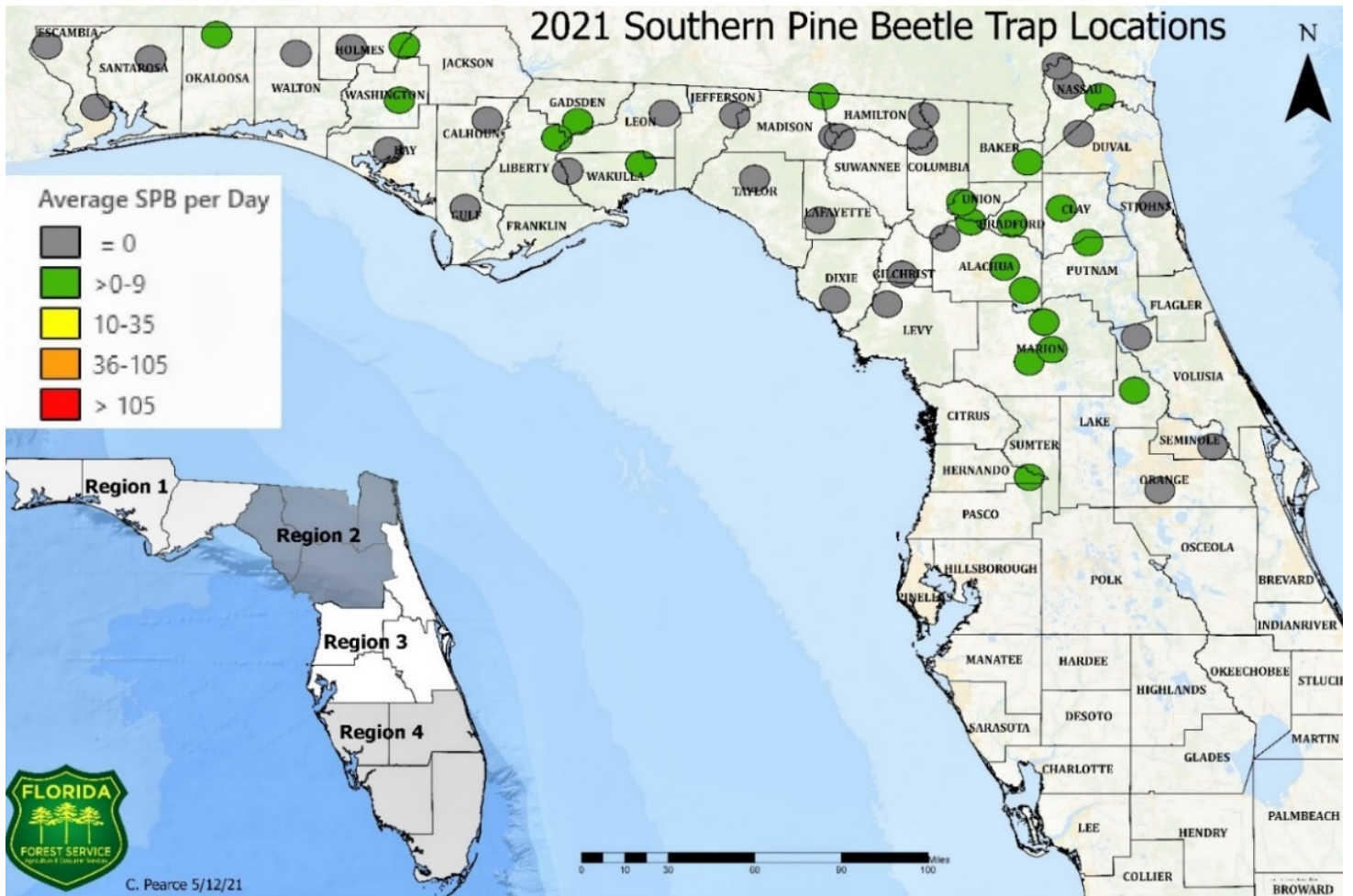


Figure 7. 2021 Southern Pine Beetle population levels (as SPB per trap per day) at each trap location.

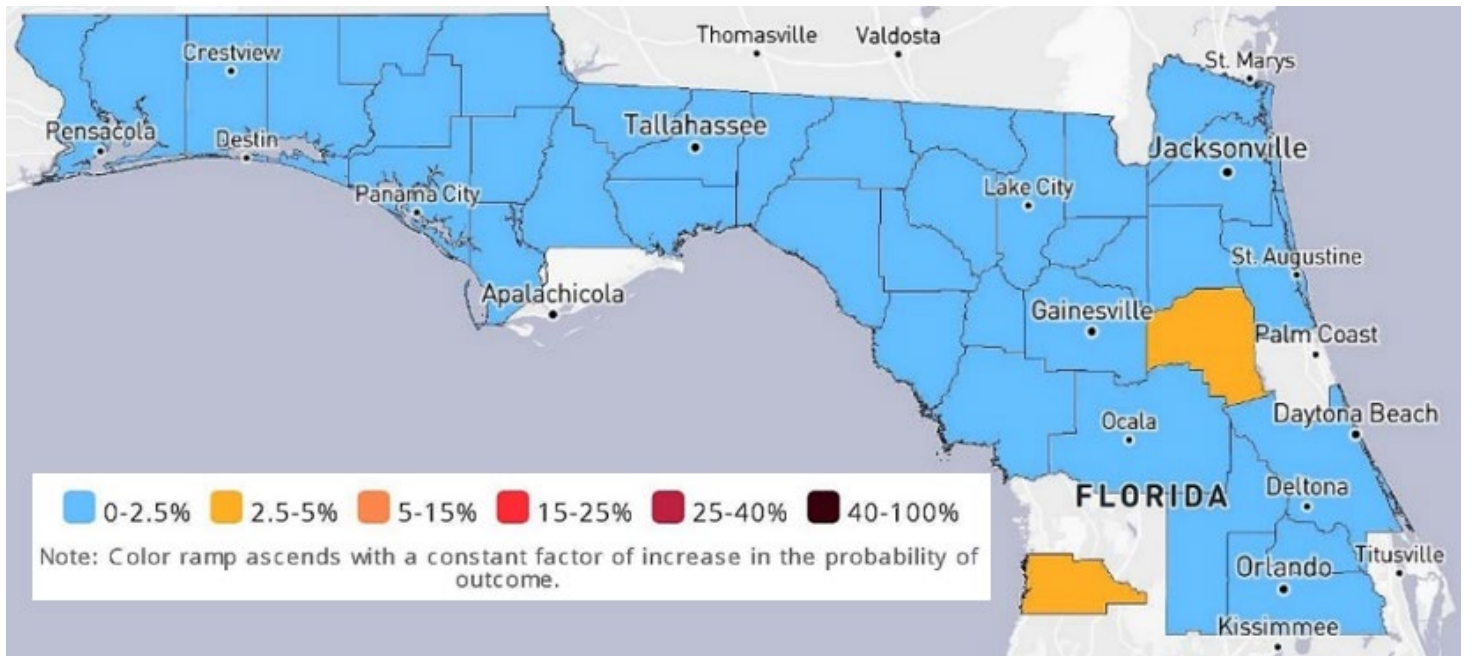


Figure 8. 2021 SPB county-level activity model prediction (as probability of >50 spots) from Dartmouth College. Counties with no color filled in had no traps established in the 2021 season.

Southern Pine Beetle Surveillance and Activity

The annual SPB aerial survey was also conducted in North Florida, from May through September 2021. FFS pilots and field staff conducted 29 flights, logging 10,690 miles over 77 hours, and covering an estimated 25,448,162 acres (Fig. 9). Field staff also investigated any suspicious areas of pine mortality with ground checks. For the second year in a row, no new SPB infestations were detected statewide.

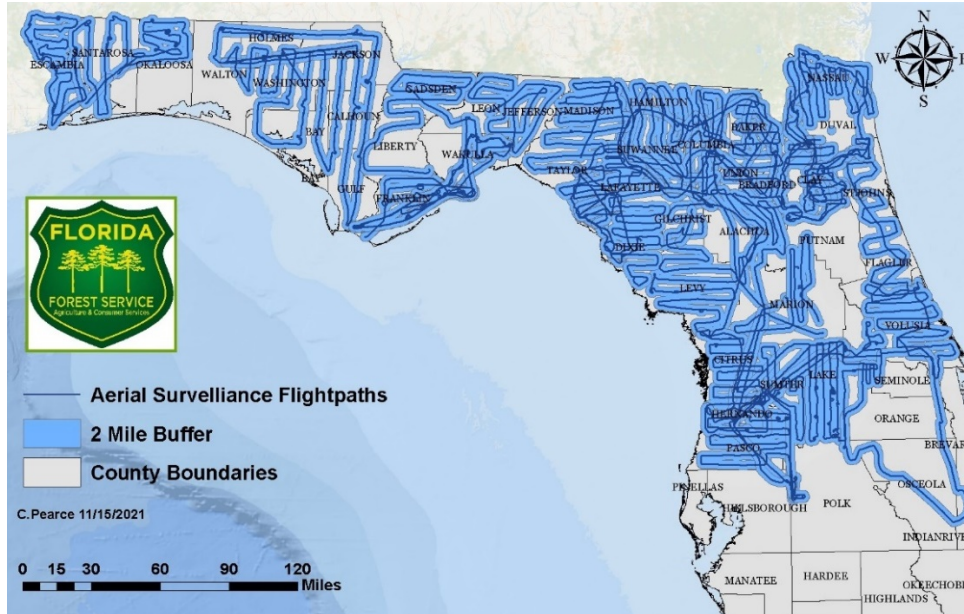


Figure 9. Flight paths and estimated survey area (2-mile buffer) covered by the SPB Aerial Survey program in Florida as of November 2021.

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