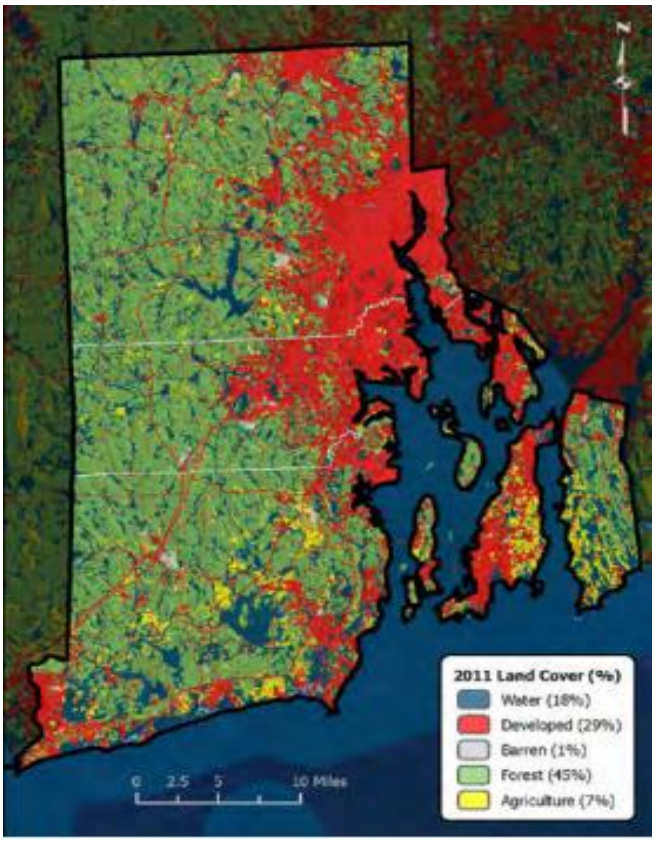
USDA United States Department of Agriculture

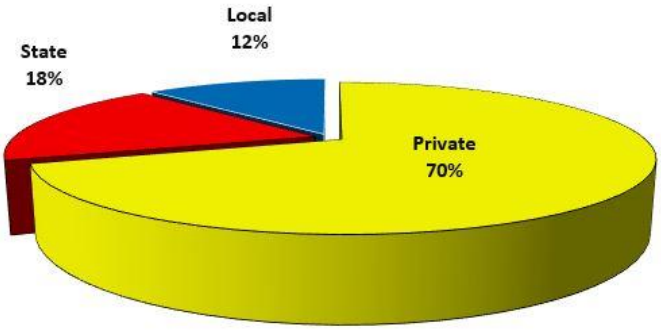
2021 Forest Health RHODE ISLAND *highlights*

Forest Resource Summary

Rhode Island's forests are 70 percent privately owned, largely by families and individuals who view their land as a source of enjoyment and a resource to be protected. Other private ownerships include corporate, tribal, conservation groups and clubs. The remainder of the forest land is in State or local town ownership.



Forest Land Ownership in Rhode Island, 2021



The most recently available Rhode Island forest inventory estimated that there are approximately 361,000 forested acres in the State. Rhode Island's forests are considered second growth and approximately 96% is classified as timberland, forest land that exceeds the minimum level of productivity and is technically available to harvest. The most common species include red, eastern white pine, black birch, scarlet oak, and yellow birch with oak-hickory forest type comprising over 60% of the forest land.

Forest composition has been affected in the past by widespread pests and diseases, including chestnut blight (*Cryphonectria parasitica*) and Dutch elm disease (*Ophiostoma ulmi*) and faces new challenges with the widespread impact of emerald ash borer (*Agrilus planipennis*) and beech leaf disease (associated with the nematode *Litylenchus crenatae mccannii*).

Forest Service
Northeastern Area
State and Private Forestry

Rhode Island
Department of Environmental Management
Division of Forest Environment

December 2020

"In the forest and wood products sector, 513 firms generated 2,496 jobs with $408 million in gross sales in 2016. The total economic impact of the forest and wood products sector, including the spillover effects across all sectors of the Rhode Island economy, is estimated at $716 million annually, with 4,844 jobs arising from this economic activity."
-*"The value of Rhode Island Forests" A Project of the Rhode Island Forest Conservation Advisory Committee and the Rhode Island Tree Council; 2020.*

Forest Canopy Surveys

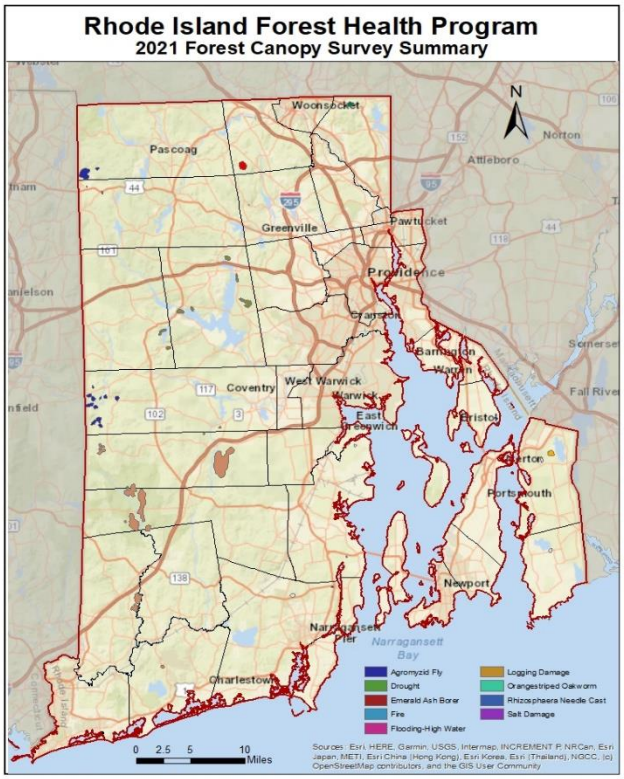
Aerial Detection Survey (ADS)

A flight was undertaken in late June to assess damage to the forest canopy from insects, diseases, or abiotic causes such windstorms, wildland fires, floods, etc. Data was collected using sketch-mapping tablets, and then processed using Desktop GIS software. As needed, polygons of damage identified in the aerial survey were ground-truthed. Finalized data of the acreage affected, and the damage causing agent were submitted to the U.S. Forest Service Field Office in Durham, NH.

The aerial survey (as well as the ground survey) was enhanced by using a pre-loaded map of ForWarn II satellite imagery indicating areas where a significant (>50%) change of canopy "greenness" had occurred. Each polygon of change was assessed from the air, and through ground-truthing.

This year there was minor damage of the forest canopy from winter moth (96 ac. Defoliated; 52 ac. mortality). There was also a previously unreported native forest pest (Agromyzid fly) that caused moderate defoliation (816 ac.). This pest had been reported in Massachusetts and Connecticut since 2018, and purportedly was in RI as well, but never detected (no aerial flight 2020).

During the aerial survey, minor damage to trees caused by salt spray, flooding, and wildland fires was also identified. And for the first time, 63 acres of ash mortality from emerald ash borer (EAB) was observed.



Polygons of forest canopy damage and mortality. (Map: RIDEM Forest Health Program).

Ground Survey

Ground surveys were undertaken to ground truth polygons identified during the ADS, to determine possible reasons for the change of greenness identified by the satellite imagery, and to detect evidence of defoliation, and other "Damage Causal Agents". The use of the satellite imagery was instrumental in this regard as there were many areas where damage was not apparent from the air. Acres tabulated by ADS significantly

underrepresent acres affected as widespread mortality, decline, and discoloration of eastern white pine (EWP) seedlings occurred throughout the state, undetected by ADS collection methods. In some instances, mature EWP recovered from the drought by the time the affected area was ground-truthed.

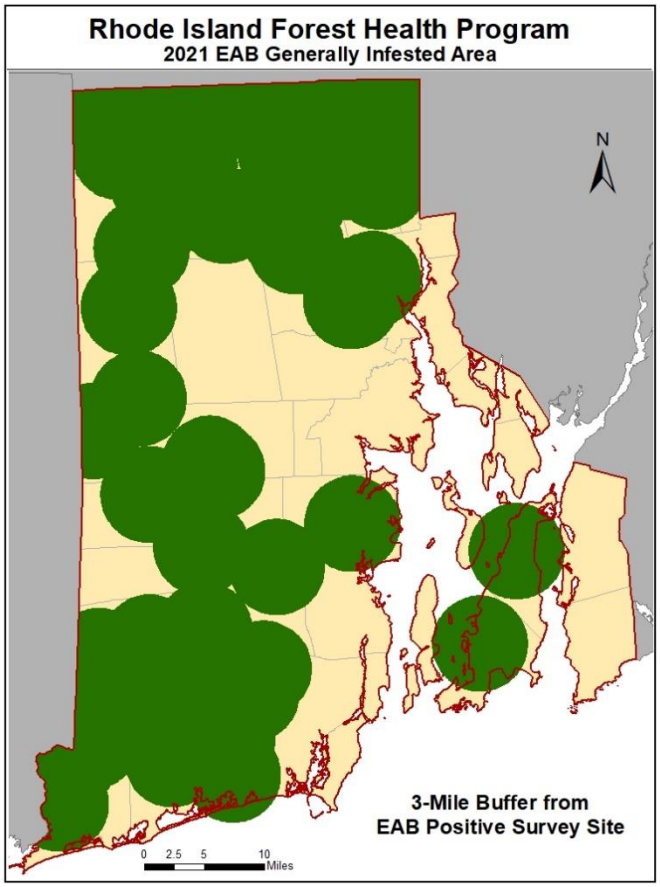
Orangestriped oakworm was present in many locations checked during ground surveys, especially in Washington County. However, little defoliation occurred, except in Newport County where there was 44 acres of light, mappable defoliation. Interestingly, this location was where a wildland fire had occurred in the spring.

A survey for *Lymantria dispar dispar* (LDD) egg masses of 38 plots within the areas of the greatest infestation in prior years yielded a single egg mass, a clear sign that the LDD outbreak of the last few years is over. However, increasing populations of LDD in neighboring states, along with the possibility of continued lack of spring precipitation maintains LDD as a species of interest and concern.

Forest Health Special Projects

Emerald Ash Borer

Multiple monitoring efforts for detection of Emerald Ash Borer (EAB) are conducted in cooperation between the RIDEM - Division of Forest Environment (DFE) and the University of Rhode Island (URI). The original intent of the monitoring program was to detect where and when EAB would arrive, which happened in 2018. Since then, the program's goals have changed somewhat. While DFE's survey goal is to establish the limits of the area considered "infested", URI's goal has been to monitor population densities, and identifying locations for bio-control efforts. URI has also taken this opportunity to monitor populations of non- target by-catch obtained in the capture process.



Areas considered "generally infested" are within a three-mile buffer of where an Emerald Ash Borer had been trapped, captured, or collected.
(Map: Rhode Island Forest Health Program).

Biosurveillance Survey: *Cerceris fumipennis*

DFE surveyed 4 sites, closing 1, and collected 40 EAB adults from 3 sites. URI surveyed 12 sites, closing 1, and collected 20 EAB adults from 6 sites.
For unknown reasons it was very difficult for either partner to capture EAB, but in those areas where we were successful, we each caught more than in 2020.

Emerald Ash Borer Trap Program

DFE continued to use the Green lindgren funnel trap to aid in delimiting the spread of EAB. When an EAB was found in a trap, the trap was moved approximately 3 miles away and reset. This process was continued through the season until no further EAB were captured.

DFE traps were set in 14 locations: URI in 19 locations. In total, only 53 EAB adults were captured. Of the 53, two were captured in Newport County (a new county find). Traps set in Bristol County have still not yielded any Emerald Ash Borer.

Emerald Ash Borer Biocontrol Program

Since 2019 URI has set up six EAB parasitoid release sites (the first in Hopkinton, then three in Burrillville, and two in Cumberland), and released nearly 41,500 parasitic wasps. The releases included *Oobius agrili*, an egg parasitoid, and *Tetrastichus planipennisi*, a larval parasitoid. Data collection to determine the establishment of a population of the parasitoid at the Hopkinton site began in 2021. One wasp was collected, a hopeful sign.

"Don't Move Firewood" poster. Courtesy RIDEM Forest Health Program.

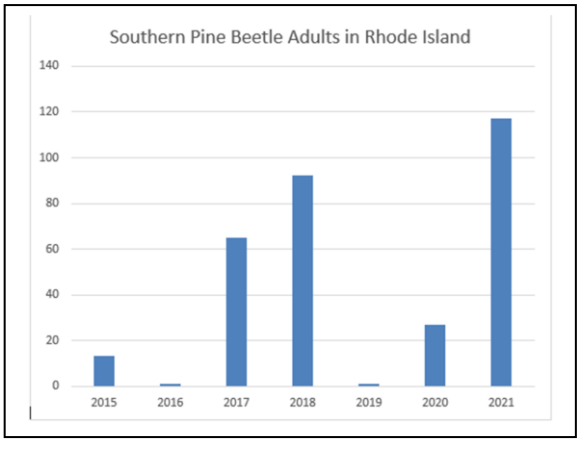
Slow the Spread Efforts

DFE continued its yearly distribution of information and posters about EAB and Asian longhorned beetle, promoting the "Don't Move Firewood" message, visiting 36 campgrounds, RV resorts, and other facilities where the movement of firewood was a concern. In addition, RIDEM added its own "branding" to the outreach material, including DEM logos and a QR code directing users to online resources. DEM also updated it's online and social media sites.

Southern Pine Beetle

2021 was the 6th season of trapping Southern Pine Beetle (*Dendroctonus frontalis*) in Rhode Island. As in 2020 DFE and URI each set and maintained 5-black funnel traps. Southern pine beetles were collected from nine of the ten traps, up from seven of ten in 2020. Also up was the number of SPB captured (117); a 468% increase from 2020, and the greatest number captured in the six years of the program.

The trapping program for southern pine beetle has identified a small population in Rhode Island's pitch pine forest, but we have not yet experienced an outbreak.



Number of southern pine beetles caught by year. (Graph: Lisa Tewksbury, URI).

Beech Leaf Disease (BLD)

"Striping" of leaf of beech infested with Beech Leaf Disease. (Photo: Fern Graves, RIDEM).

Rhode Island echoed the seemingly rapid spread of BLD in other states, with multiple reports and finds throughout Rhode Island. URI, with the assistance of the USFS, established five more permanent survey plots (6 total) in geographically dispersed locations in all counties except Providence (no suitable site found).

URI Plant Pathologist Heather Faubert, along with Nathaniel Mitkowski from URI and collaborators from the CT Ag Experiment Station and Rainbow Tree Care, have set up pesticide trials looking to manage beech leaf disease.

Abiotic Factors

Weather/Climatological (10/1/20-9/30/21)

"Highly Variable" would be the best words to describe the weather/climate for the reporting period. On the heels of a multi-year drought, Rhode Island experienced a wet fall (2020) with sufficient rainfall to break the drought and then some. That excess precipitation was then offset by much drier than normal January- June plunging the State into another drought situation. Rainfall that did occur came in torrents, leaving trees little opportunity for absorption. The cycle of drought/flood was the most consequential factor affecting forest health this year.

During the winter of 2021, the FHP received multiple reports of needle discoloration of eastern white pine, especially in the sapling and pole stages. Affected sapling stage trees also often exhibited reddish colored bark and *Caliciopsis* cankers, or only reddish bark. It was common to find a very high percentage of seedlings in the stand with these symptoms. URI plant pathologist Heather Faubert inspected some sites and suspected that drought was the DCA. Consultation with USDA FS Pathologist Isabel Munck agreed with Ms. Faubert's conclusion. Field visits to these sites later in the season found significant mortality of affected trees. In most instances the change of greenness was identified by ForWarn imagery and reported as "Drought" (2,786 ac.), but this number significantly underrepresents actual conditions. Washington County was particularly hard hit.

Another impact from the drought/flood cycle was tree mortality from flooding. The torrential rains raised water levels in some areas enough that a few acres (6.85 ac.) of perimeter uplands were affected (mortality and leaf/needle discoloration).

Warmer than normal conditions occurred in eleven of twelve months, finishing the twelve-month cycle 1.9°F above the ten-year mean average, and at 54.1°F, 0.5°F above the 2020 mean average. As with the precipitation data, temperatures fluctuated dramatically throughout the year.

There were 99 wildland fires which burned 180 acres of forest and damaged 4 residences.

Forest Service Assistance

The aerial survey was greatly aided by the use of “Change of Greeness” data collected by USDA FHAAST using ForWarn II satellite imagery. This imagery was also essential to much of the drought related canopy damage determinations, and finding smaller polygons of damage that were not identified during the flight.

U.S. Forest Service Remote Sensing Specialist Bill Frament provided significant assistance to the Rhode Island Forest Health Program Coordinator in the analysis, development, and interpretation of ForWarn satellite imagery.

U.S. Forest Service Pathologists Isabel Munck, and Cameron McIntyre assisted in identifying damage to eastern white pine in Rhode Island. Cameron also helped URI Plant Pathologist establish 6 long term monitoring plots for beech leaf disease.

References

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USDA Forest Service. 2020. Forests of Rhode Island, 2019. Resource Update FS-242. Madison, WI: U.S. Department of Agriculture, Forest Service. 2p. https://doi.org/10.2737/FS-RU-242

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Land Use/Land Cover
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Forest Health Programs

State forestry agencies work in partnership with the U.S. Forest Service to monitor forest conditions and trends in their State and respond to pest outbreaks to protect the forest resource.

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