

This copy is for your personal, non-commercial use only. To order presentation-ready copies for distribution to your colleagues, clients or customers visit <https://www.djreprints.com>.

<https://www.wsj.com/articles/invasive-insects-and-plants-spread-northward-11628427602>

## SCIENCE

# Invasive Insects and Plants Spread Northward

From tree-eating beetles to crop-smothering vines, pests once found only in more southerly latitudes are expanding their ranges, as climate change spurs warmer winters

By [Sarah Trent](#) / Photographs by Johnny Milano for *The Wall Street Journal*

Aug. 8, 2021 9:00 am ET

Chris Steigerwald saw the browning tops of the pitch pines and hiked toward them for a closer look. As he drew near, the New York forester said he saw tree trunks marked with hundreds of oozing, popcorn-like defects—evidence the trees were infested by a tiny beetle with a big appetite for pine.

“I never like finding the southern pine beetle because I know all these trees are going to die,” Mr. Steigerwald said of his July trek. But he is glad he spotted them: These beetles, “a pine tree predator,” he said, quickly spread if his team doesn’t catch them early.

Week after week, Mr. Steigerwald drives and hikes Long Island’s Central Pine Barrens, tags trees infested with the beetle and chainsaws them down. Since the invasive insect was discovered on Long Island in 2014, the New York Department of Conservation reports that foresters have cut down more than 10,000 pines in the network of state and federal preserves there. Eradication is impossible, agency documents say; they can only hope to slow it down.

Just a few decades ago, it seemed unlikely that the southern pine beetle—a species native to the Southeastern U.S., Mexico and Central America—could make its way to New York. Today, invasive-species researchers say this beetle is one in a rising tide of plants and pests marching north. Invasive species like the southern pine beetle, emerald ash borer and kudzu already cost the U.S. economy \$120 billion a year in damage and removal costs, according to the U.S. Department of Agriculture. They choke crops, topple telephone poles, devalue timber and require extraordinary effort to beat back.



Aerial view of trees damaged by southern pine beetles in the Bienville National Forest in Mississippi.

PHOTO: USDA FOREST SERVICE

The Northeastern U.S. has long been vulnerable to invasive species because of its transportation hubs, through which travelers and goods inadvertently spread non-native species, and the hurricanes and other wind events that move seeds and insects up the Eastern Seaboard. Research also shows that state laws governing the sale of non-native plants in the region are inconsistent.

A body of evidence suggests that the problem here and nationwide is growing worse as a result of climate change—in particular, a warming of winter’s lowest temperatures. The coldest temperature of the year at some measurement sites in New York and New England has risen more than 6 degrees Fahrenheit since the 1960s, according to the most recent National Climate Assessment, a federal government report released in 2018.

“This is a massive change from an ecological perspective,” said Matt Ayres, a Dartmouth College entomologist whose work in the 1990s was among an early body of research suggesting rising temperatures could have profound impacts on invasive species.



The southern pine beetle is one of the invasive species that attack trees.

Back then, his research team sought to understand why the southern pine beetle—an aggressive insect ubiquitous in the South—hadn’t yet invaded pine habitats in other parts of the country. They tested every barrier they could think of: Did habitat factors limit their food supply? Did summer warmth limit their breeding? The researchers determined that the factor limiting northward expansion of the beetle seemed to be the temperature on the coldest night of the year.

“Sitting in the laboratory watching the temperature of the beetle, it goes down, down, down, down, and then there’s a spike,” Dr. Ayres said, recalling their experiments. “That’s the heat of fusion the moment the fluids in the beetle crystallize.” At about 10 degrees Fahrenheit, it is the precise moment of its death. Beetles couldn’t thrive much farther than Delaware, his team surmised, because of the cold winters.

Based on regional temperature data, Dr. Ayres predicted in the 1990s that should the coldest night of the year warm up by 5 degrees, infestations could spread about 100 miles north to threaten pine ecosystems.

What they didn’t expect, Dr. Ayres said, was how fast the temperature shift would occur. By 2018, U.S. Forest Service researchers confirmed the southern pine beetle had reached as far as Connecticut and Rhode Island, a 140-mile expansion northward.



Canopy color change is a clear indicator in trees infested with the southern pine beetle.

Carrie Brown-Lima, head of the New York Invasive Species Research Institute at Cornell University, said pests are now thriving here that she never thought could. “We really need to shift our thinking to understand that those rules don’t apply anymore,” she said. Otherwise, she added, “we’ll end up spending more money and having less impact” managing them.

Kudzu—a fast-growing vine already causing \$100 million in annual damage to the agricultural and timber industries, power and railroad companies and public lands, according to plant researchers—has recently been found thriving along the Garden State Parkway by New Jersey invasive-species managers.



An old house in South Carolina is partly covered by kudzu, a rapidly spreading vine.

PHOTO: UPPA/ZUMA PRESS

Hemlock woolly adelgid, a sap-sucking insect that the National Park Service says has destroyed up to 80% of the eastern hemlocks along the Blue Ridge Parkway in Appalachia,

is now killing trees as far north as Maine and Nova Scotia, according to the Maine Forest Service and Canadian government.

The emerald ash borer, which according to the U.S. Forest Service has eaten its way from the Midwest to the Northeast doing nearly \$12 billion in damage to U.S. ash trees since it arrived in 2002, is now moving deeper into Canada, according to scientists there.



A tree infested with the southern pine beetle.

Although climate change has given many invasives the opportunity to thrive in new places, it doesn't make their arrival inevitable, said Bethany Bradley, plant ecologist and co-founder of the Northeast Regional Invasive Species and Climate Change Management Network of scientists, policy makers and natural-resource managers.

“The best management of an invasive species is to prevent it before it arrives,” she said, and one way to do so is targeting known pathways of introduction. For pests, that might mean regulating the use of solid wood shipping crates, a common vector for wood-boring insects. For plants, she said, the best tool is laws to prevent sales of ornamental plants known to harbor invasive pests or causing extensive damage themselves.



A southern pine beetle in Louisiana completing its metamorphosis into an adult that will attack trees.

PHOTO: ERICH VALLERY/USDA FOREST SERVICE/ASSOCIATED PRESS

University of Massachusetts researchers Evelyn Beaury and Emily Fusco this year compiled regulations from every state and found that nationwide, banned-plant lists among neighboring states are often very different from each other. Some states, they found, have no regulations at all. “That automatically creates gaps across the country,” Ms. Beaury said.

Wayne Mezitt, chairman of Weston Nurseries and member of a group advising the commonwealth of Massachusetts on managing invasives, said that while nurseries don’t love regulation, most respond well to rules on invasive species. His group is developing guidelines to inform state regulation, he said, and he’d like to see uniform invasiveness criteria nationwide that would ease confusion and create space for the industry to develop noninvasive versions of some species otherwise banned. “We want to do something that’s right for the future,” he said.

In Maine, state forest service entomologist Tom Schmeelk monitors southern pine beetle traps at 12 sites across the state, aiming to catch an invasion as early as possible.

He fears for the state’s red pines, an important source of extra income for rural families, and the pitch and jack pine forests along beaches that draw tourists to the coast. It is there that he expects the beetles will first arrive—somewhere like popular midcoast Popham Beach, he said, “traveling with the wind.”



Forester Chris Steigerwald searches for trees infested with the southern pine beetle on Long Island.

---

#### MORE COVERAGE OF NATURE, THE ENVIRONMENT

---

These articles have been chosen by Wall Street Journal editors.

[Mammoth Iceberg Jeopardizes Millions of Penguins](#) (Dec. 19, 2020)

[A German Island Says Enough With All the Cranberries](#) (Nov. 22, 2020)

[Amazon Bans Foreign Plant Sales to U.S. Amid Global Seed Mystery](#) (Sept. 5, 2020)

---

Copyright © 2021 Dow Jones & Company, Inc. All Rights Reserved

This copy is for your personal, non-commercial use only. To order presentation-ready copies for distribution to your colleagues, clients or customers visit <https://www.djreprints.com>.