

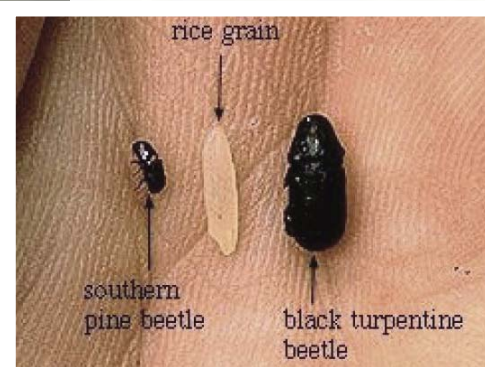


# Southern Pine Beetle Threat

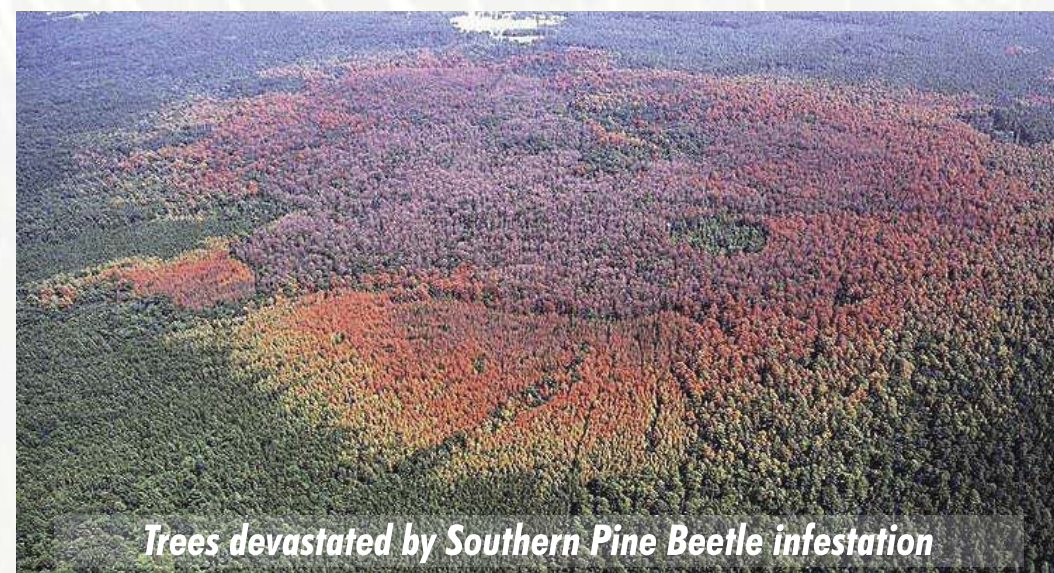
In addition to shrinking natural habitat and the absence of fire to enable reproduction, pitch pines face a new threat. Due to climate change, an invasive insect pest, the southern pine beetle (SPB – *Dendroctonus frontalis*), is moving north and poses a severe threat to the species' survival. In 2017 the Connecticut Agricultural Experiment Station (CAES), assisted by graduate students from various New England universities, began monitoring for the presence of SPB at four sites in the state. One of the sites is in the preserve, where traps have been placed and evidence of SPBs has been found.

## Biology and Lifecycle

The southern pine beetle (SPB) is a small insect, only about an eighth of an inch in length. It is the most destructive insect in the southeastern United States economically. Until recently it was restricted mainly to the southeastern states. In 2009, it was found in the New Jersey Pine Barrens and, in late 2014, in extensive pine stands on Long Island. In 2015, it was found in Connecticut.



Beetles boring into the bark of pine trees and feeding on the inner bark or on the cambial layer between the bark and the wood are not that unusual. What makes



Trees devastated by Southern Pine Beetle infestation

SPB different is its tendency to go into outbreak mode periodically. When the population swells to large numbers, it can attack and kill even healthy trees, creating large stands of dead trees.

Like all beetles, SPB undergoes a complete metamorphosis during its lifetime. This means it goes from egg to larva to pupa to adult. The larval stage is the feeding stage, during which the insect does most of its damage. The adult stage is when dispersal and reproduction occur. It is also when the beetle carries a blue-stain fungus, a key feature of the insect's destructive capability.

Attacks by SPB are initiated by individual females. Once a female finds a suitable tree, she releases a pheromone that attracts both female and male beetles. As the insects gather, the females bore into the bark. The boring triggers the tree to produce resin to "pitch out" the invading insect,



Above: Tree repelling attack of Southern Pine Beetle with "pitch tubes"

Top right: "Pitched" Southern Pine Beetle



essentially drowning it in resin. Through this technique, healthy trees are often able to survive an attack. However, if the tree is weakened or the beetles are in sufficient numbers, SPBs can overwhelm the tree. In the end, a successful attack will kill a tree, although not immediately.

Once beneath the bark of the tree, the female mates and builds characteristic S-shaped galleries, laying eggs in the sides of the galleries as she moves along. As she moves through the tree, she is also inoculating it with a blue-stain fungus. The fungus, which then grows within the sapwood of the tree, helps to provide food for the developing larvae. The fungus also contributes greatly to the death of the tree because it blocks the circulatory system within the tree.

In warmer parts of the United States, SPBs may have six or more generations per year and can winter over in all life stages. At its northern fringes, it is not yet known how many generations may occur during a single growing season. It is also not yet known what life stages are able to survive the winter in places such as Connecticut, although the late developmental larval stage appears to be the most cold hardy.



Far right: View beneath infested bark

Right: Detail of S-shaped galleries



Source: CT - DEEP

