

Native Pests in Novel Places: The Southern Pine Beetle Example

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Climate-driven changes in pests and disease are already affecting forest health (see earlier bulletin on [Forest Pests and Climate Change](#)). Several native pests have shown signs their range is expanding with warming temperatures and this phenomenon—native pests moving into new geographies—will be more common in the future. The novelty creates challenges for managers, but there is good news. Unlike most alien invasive species, we have far more information (both research and institutional knowledge) about these organisms and examples of practices that have worked in other regions. With the right networks in place for sharing information, the learning curve will not be as steep and the likelihood of an effective response increases.

Southern Pine Beetle Outbreak Risk

Southern pine beetle (SPB) is one of the most destructive pests in the southern U.S. and outbreak risk depends on the size and location of the SPB population *and* the susceptibility of the host (at the tree, stand, or landscape level). Weakened or stressed trees are often the “patient zero” of SPB spots during an outbreak. There are also a variety of stand-level characteristics that affect the vulnerability of host trees by influencing resource availability, density, stand age/size, and the dispersal of beetle pheromones (see [Table 1](#)). High density in pine stands, in particular, is known to increase risk.

SPB in the Northern Context

Warmer winter temperatures have facilitated the northern expansion of the SPB range (via improved over-winter survival) and model projections suggest the climate will become progressively more suitable in these areas over time. SPB primarily attacks hard pines (preferably loblolly and shortleaf) in its historic range, but it will successfully attack “nontraditional” host species (e.g. eastern white pine, red spruce,

Norway spruce, eastern hemlock, and others) when outbreak populations are large enough. Pitch, red, and Scots pine have all proven to be suitable hosts in recent northern outbreaks. It is possible the composition of northeastern forests (i.e. few pure pine stands; more isolated, disbursed populations of potential hosts) will reduce the risk of severe outbreaks at the landscape level. The greatest risk will be where host species occur in relatively pure, high density stands, e.g. pitch pine barrens.

New research suggests the climate of northeastern U.S./southeastern Canada will be hospitable for SPB by 2090 and northern host tree species will be vulnerable over large portions of their range even sooner (~78% of pitch pine by 2050, 71% of red pine and 48% of jack pine by 2080).

SPB Management: Things to Do

For managers encountering this pest for the first time, there is extensive literature and practice to draw on. The “things to do” include:

- **prevention** (i.e. thinning high hazard areas),
- **prioritization and hazard models** (i.e. assessing susceptibility based on stand characteristics to identify priority areas for treatment),
- **detection and monitoring** (i.e. aerial surveys and pheromone-baited traps), and
- **evaluation and direct control** (i.e. cutting infested trees and a green tree buffer using the cut-and-leave or cut-and-remove method).

Conclusion

Going forward, it will be important to stay attuned to the expanding range limits of particularly destructive native pests, be proactive where possible, plan for control efforts in susceptible areas, and monitor reports from newly affected areas to learn about any changes in pest behavior.

The full bulletin also includes an [overview of SPB biology](#) and a list of [additional resources](#).

Click on the sub-headings to go directly to the corresponding section of the full bulletin, or read the complete bulletin online: <http://climatesmartnetwork.org/2018/09/native-pests-in-novel-places-the-southern-pine-beetle-example/>