Vermont Forest Health

White Pine Health Monitoring

Department of Forests, Parks, & Recreation
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What's the problem?

Over the past decade, cool and moist spring weather has led to a noticeable regional increase in needle diseases and other fungal pathogens of eastern white pine (*Pinus strobus;* EWP), resulting in white pine decline in some places. A complex known as White Pine Needle Damage (WPND) has been widespread, with four fungal pathogens frequently observed: *Lecanosticta acicola, Lophophacidium dooksii, Bifusella linearis, and Septorioides strobe.* In some instances, more than one type of fungus is found on an infested tree. Rain promotes the production and dispersal of fungal spores, which land on newly emerging pine needles. These new needles do not show symptoms until the following year when they turn yellow and are shed prematurely.

White pine needle damage has been extensive in Vermont, with 30,600 acres mapped in 2016 and over 40,000 acres mapped in 2018. Neighboring states are also observing decline associated with the canker fungus *Caliciopsis pinea* as well as white pine blister rust. A multi-state evaluation and monitoring effort began in 2017 to address regional white pine health issues identified as prominent concerns in MA, ME, NH, NY, RI and VT.

Symptoms of WPND in mid-June

What's the project?

The purpose of this multi-state effort is to: (i) use a variety of tools to identify white pine stands with differing levels of symptom severity; (ii) determine the stand factors associated with WPND incidence and severity with on-the-ground survey; (iii) assess the impact that this long-term disease pressure has had on white pine decline and regeneration, and develop management practices to improve white pine health.

Vermont has assessed white pine health in 22 plots throughout the state. Along with other states involved with this project (MA, ME, NH, NY and RI), we selected sites that either exhibit decline symptoms in mature trees, or contain visibly healthy trees. Within each site, we evaluated basic tree measurements (crown density, DBH, live crown ratio, crown position) as well as disease measures. The latter included presence/absence and severity of 1) WPND symptoms, 2) *C. pinea*, and 3) white pine blister rust. Additionally, site factors were evaluated including stand density, pine regeneration success, slope and aspect. When possible, needle samples were collected for fungal analysis at UMass-Amherst.

Browning needles associated with WPND. (credit: R. Kelley)

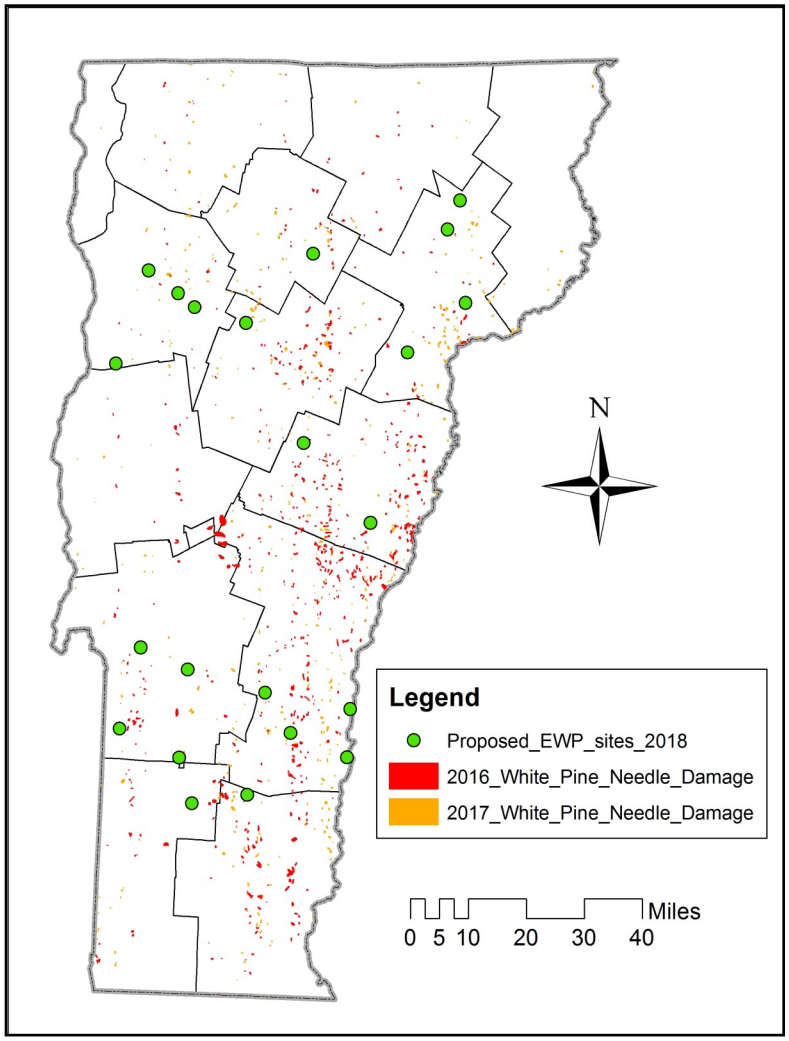
Outcomes of this work

Field data were collected during summer 2018 from all states involved with the project. These data will be analyzed and a report summarizing the findings will be produced by early 2020.

Completing this project will yield important information on the geographic extent and severity of the various white pine diseases in region. By better understanding areas affected by these diseases, more appropriate management guidelines will be developed.

Questions about the project should be directed to Josh Halman (joshua.halman@vermont.gov; (802) 279-9999).

WPND visible on lower crowns during aerial survey



2018 White pine health monitoring sites and WPND mapped during aerial surveys in 2016 and 2017.

Resin streaking at a branch whorl caused by white pine blister rust. (above, left).

Resin streaks from Caliciopsis canker are scattered between whorls. (above, right).

Calicopsis fruiting bodies (right)

For more information, contact the Forest Biology Laboratory at 802-879-5687 or:	Windsor & Windham Counties…….. Bennington & Rutland Counties…… Addison, Chittenden, Franklin & Grand Isle Counties……... Lamoille, Orange & Washington Counties …… Caledonia, Orleans & Essex Counties……	Springfield (802) 289-0613 Rutland (802) 786-0060 Essex Junction (802) 879-6565 Barre (802) 476-0170 St. Johnsbury (802) 751-0110

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