A few years ago I wrote a short piece on some health issues white pine was experiencing in Rhode Island and throughout New England. UMass Extension recently put out a nice summary of some of these issues which can be found at https://ag.umass.edu/sites/ag.umass.edu/files/content-files/alerts-messages/2016_white_pine_update.pdf. After reading it I said, yeah we have all of those here in RI, but they forgot about gypsy moth. While the rash of diseases affecting white pine is a serious threat, they usually progress at a slower pace than an insect infestation like the one we're seeing this year. While gypsy moth caterpillars prefer feeding on oaks during all stages the caterpillar phase of their life cycle, when they are about half grown and feeding pressure on oaks is high, white pine becomes a favored food. And when this happens, the visual effect can be striking. Widespread gypsy moth defoliation in Rhode Island is nothing new. There were major infestations in the 1970s and more recently in 1981-82 when over 300,000 acres of forest were affected in each of the 2 years[1] with less severe localized outbreaks in other years.

When gypsy moth caterpillars start feeding on pine they prefer the older needles of both pitch and white pine rarely eating the new needles of pitch pine while the current year needles of white pine are eaten more readily. Because of this feeding pattern, many of the current year needles of pine are not damaged or only lightly fed upon unless caterpillar populations become very high[3]. Pines growing in stands mixed with preferred hardwoods or as an understory component in a hardwood stand are much more susceptible to defoliation than stands of pure or nearly pure white pine. In the mixed stands the availability of preferred foliage (oak) allows the young caterpillars to survive and grow to the point when white pine foliage becomes a suitable food source. A study conducted in 1941 found that in the main canopy of pine-hardwood stands when all old needles were eaten and new foliage was defoliated between 0 and 80%, tree mortality was about 10% but when defoliation of the new needles grew to greater than 80%, white pine mortality grew to more than 30%. When pine of any size is 100% defoliated, significant mortality can be expected. A study conducted by Dr. Jim Brown while a professor at URI found that after the 1980-81 outbreak, all severely defoliated overstory white pine stems in the oak-pine type and 84% in the pine-oak type were in good condition while almost all of the overstory pine sustaining moderate or light defoliation were in good condition in 1983. An earlier study from 1963 found that although most white pine mortality occurred in the first two years following defoliation, mortality did continue right through the fifth year. Because of the drier sites found in much of RI, many acres have included treatments to encourage white pine into the main canopy as it often grows better on these sites than hardwoods. Brown (1988) concluded that cutting practices that encourage the growth of understory white pines to canopy positions where trees are less vulnerable should be a first priority of management in these stands. White pine in the understory is a different story. When severely defoliated, these saplings, which may have had limited crowns prior to defoliation did not recover.

Of course all of the above referenced studies on gypsy moth defoliation and white pine were done prior to the needle diseases and stem cankers we have been seeing on white pine recently and mentioned in

the UMass Extension write-up. Some of the damage to white pine being attributed to gypsy moth may be a disease or influenced by a disease. Another factor that is somewhat new is the changing climate and precipitation. Many understory white pines on Providence Water property started turning red last fall, one thought is that it may be the result of the drought conditions experienced in May of 2015 when rainfall for the month totaled a mere 0.50". Studies done in the 1940s, 50s, 60s, etc. may give us an idea of what might happen going forward, but the conditions when they were done have changed and there are more factors in play. Probably the best you can do is keep track of what is happening in your woodlot, try to keep up to date with current thinking, and be ready to practice adaptive management which may involve doing something or holding off or revising something you were planning on doing.

Literature Cited

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