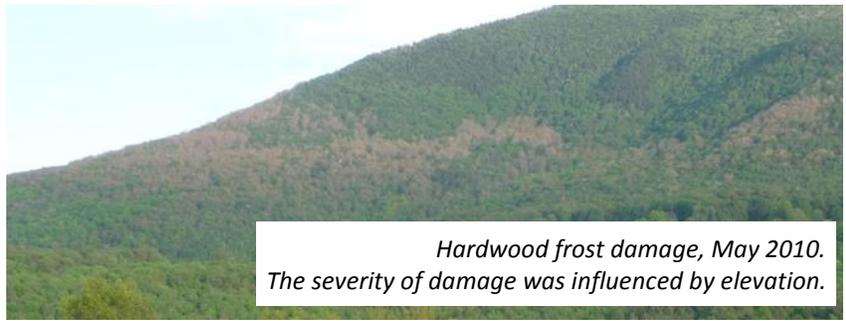


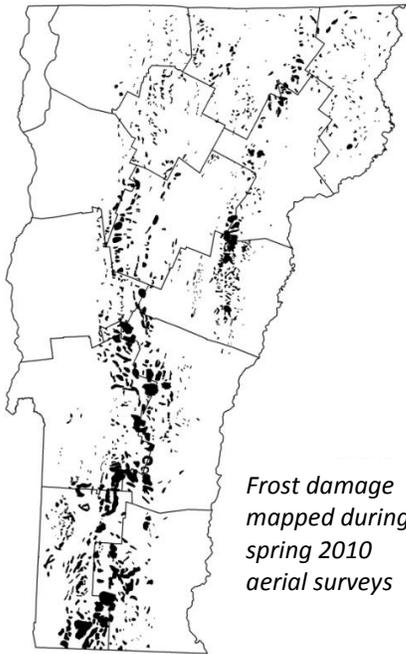
Vermont Forest Health Update

Evaluating Sugarbush Recovery from 2010 Frost Damage

Vermont Department of Forests, Parks, and Recreation; September 2010



Hardwood frost damage, May 2010. The severity of damage was influenced by elevation.



Frost damage mapped during spring 2010 aerial surveys

Damage to sugar maple foliage was widespread in 2010, due to below-freezing temperatures in early May. Pear thrips feeding often added to the damage. In some affected areas, trees never fully refoliated, and had small, sparse leaves all summer.

Expected Impact

Whenever leaf area is reduced by more than 30%, we expect health impacts. If trees refoliate, however, they can recover quickly from a single May defoliation.

If they don't refoliate fully, foliage is compromised for an entire growing season, and trees are at risk. Food reserves may be depleted, leading to dieback and mortality. Maple declines initiated in this way include dieback in Vermont in the early 1980's when frost and forest tent caterpillar defoliation occurred in the same year, and maple blight in the Midwest in the 1950's when defoliation by leaf rollers was followed by maple webworm.

Sugar maples have been in generally good health because of several years with ample precipitation and without major pest problems. With no additional stresses, recovery is likely, with higher odds of quick recovery on nutrient-rich sites and in regions of the state which had more consistent rainfall in 2010.

However, the impact of this year's damage won't go away instantly. Carbohydrate reserves are reduced. Fewer leaves will be produced in 2011, limiting next year's food production. With lower food reserves, trees won't close tapholes as quickly, and won't compartmentalize discolored wood as well as normal. Additional stress from weather, forest pests, or human causes could easily initiate maple decline and mortality.

Sugarbush Recommendations

Assess tree condition before leaves drop. Evaluate trees up and down the slope, as severity of damage was often determined by elevation. Check for sparse foliage and noticeably small leaves. Tap trees with foliage damage conservatively in 2011.

Monitor tree condition in summer, 2011. If trees have symptoms of decline or have been subject to additional stress (such as drought, defoliation, or stem wounds) their health is in jeopardy. These trees should be reserved from tapping in 2012.



Sugar maple in frost damaged areas, September 2010. Tree health is at risk when foliage has been sparse for an entire growing season.



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