



Seeing the Forest for the Trees (and Snags)

Results of Annual Forest Health Survey for Saint-Gaudens NHS

Background

Forests of the northeast have a long history of resiliency and recovery. Ice ages, weather events, large scale clearing, and introduction of pests and invasive species have all played significant roles in shaping the forest communities we have around us today.

Long-term health of the forests of Northeast Temperate Network (NETN) parks is a high-priority for the network. The goals of the forest monitoring program are to assess status and trends in the composition, structure, and function of forested ecosystems, and to interpret and report the condition of forest systems in a way that effectively informs park managers and other stakeholders.

Purpose and Scope

To aid in reporting data in a clear and useful way, NETN developed the Ecological Integrity Scorecard, which interprets the condition of forested ecosystems by assessing a range of ecological components in relation to their natural or historical conditions.



Blow-Me-Up Brook flowing through the park's forest. NPS photo.

Integrity is ranked in one of three categories: Good, Caution and Significant Concern. “Good” represents acceptable or expected conditions; “Caution” indicates a problem may exist; and “Significant Concern” indicates undesired conditions that may need management action. It is important to note that “ecological integrity” may not be the primary goal of natural resource management at all network parks, particularly at historical parks and sites where cultural resource management may take precedence. However, being able to compare the condition of park resources to ecological integrity benchmarks is valuable because it provides a deeper understanding of park condition, as well as a consistent baseline for assessment of management goals.

Results and Findings

Tree diameter distribution at Saint-Gaudens is typical of second-growth forests in central New England with few trees represented in large diameter size classes and many in smaller size classes. Eastern hemlock was the dominant tree species in forest plots, but eastern hemlock seedlings were sparse. Beech was by far the dominant species in both the seedling and sapling layers, but most beech trees were less than 20 cm DBH (diameter at breast height). A similar pattern has been observed throughout hardwood forests in the northeastern U.S.

A century or more of beech bark disease has yielded thickets of beech that originated from prolific root sprouting by stressed and dying trees. If regeneration patterns continue, future forest composition could shift towards increased dominance of disease damaged beech and less eastern hemlock.

Dead wood, in the form of standing dead trees (snags) and fallen coarse woody debris (CWD), is an important structural feature of forests that provides habitat for a wide variety of species. Logging and hazard tree removal can reduce the quantity or quality of these features, but strategic land management can maintain or enhance snags and CWD. The park rated as “Caution” for both snag abundance and CWD.

More Information

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<http://science.nature.nps.gov/im/units/NETN/monitor/monitor.cfm>

Species Spotlight: Eastern Hemlock



Though unrelated to the poisonous herb used to kill Socrates in 399 B.C., the eastern hemlock (*Tsuga canadensis*) did get its name from the toxic shrub because early European settlers thought the smell of its burning needles was similar to the Old World plant. Ironically, as settlers soon learned from Native

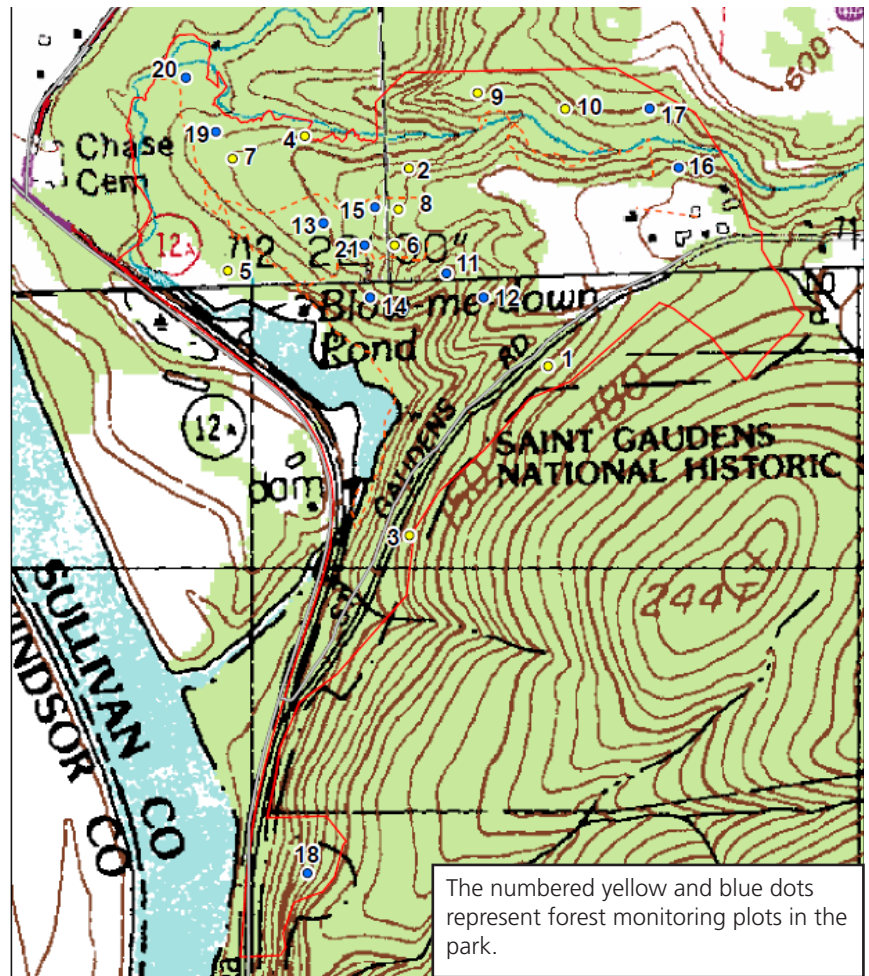
Americans, the eastern hemlock's needles are far from poisonous and can actually be brewed to make a nutritious, Vitamin-C rich tea.

Hemlocks both produce and thrive in ample shade. Often the only trees that can grow under its dense canopy are other hemlocks. Preferring thinner, moister soil than the also shade tolerant sugar maple, hemlocks grow well in mature, mixed forests and along cool, rocky shorelines, ridge tops, and especially north-facing slopes.

Hemlock bark is very rich in tannins, a natural chemical preservative that also helps protect the tree from insects, animals, and infections. Tannins were also used to 'tan' hides to turn them into leather. Bark was stripped from felled hemlocks from May to August, when it was looser and peeled from the tree more easily. The debarked logs were then sometimes used for river log drives because the slippery smooth surface easily slipped through bark-bearing spruce and pine, opening up passes and discouraging potential log jams.

Today, the long-term health of this iconic tree in the northeast is in question thanks to an invasive insect that is threatening to decimate the tree throughout its entire range. The hemlock woolly adelgid is a fluid-feeding insect that feeds on hemlock trees throughout eastern North America. Their egg sacs look like the tips of cotton swabs clinging to the undersides of hemlock branches. It was introduced from Asia into the Pacific Northwest in 1924 and was first detected in the northeastern US in the 1950's.

Eastern hemlock is more susceptible to hemlock woolly adelgid damage than Asian and western hemlock trees due to feeding tolerance and predators that protect the latter species. Hemlock woolly adelgid sucks fluid from the base of hemlock



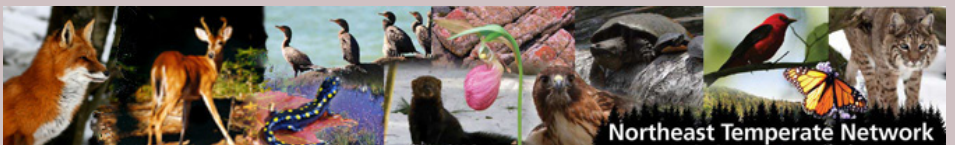
needles and may also unintentionally inject toxins into the tree as it feeds, accelerating needle drop and branch dieback. Although some trees die within four years, trees often persist in a weakened state for many years. Hemlocks that have been affected by hemlock woolly adelgid often have a grayish-green appearance (hemlocks naturally have a shiny, dark green color).



The underside of a healthy hemlock branch. Maggie Neely photo.



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