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How information gathered from NETN monitoring programs is used to help guide park management decisions

The I&M Northeast Temperate Network (NETN) collects, stores, and analyzes a wide breadth of natural resource information each and every field season including water quality, forest health dynamics, breeding bird populations, invasive species, and several other monitoring protocols. But does this ever growing mountain of data have any affect on the management decisions that parks need to make from year to year? The short answer is “yes.” This series of briefs explores some specific examples.

Oh Deer, Invasives are Here.

As unwelcome as an army of Redcoats, an over abundance of white-tailed deer and an increasing amount of invasive plant species have been negatively impacting the forest health of Morristown National Historical Park for decades, well before NETN began monitoring there. As hard as it is to imagine now, by the late 1800's the deer population in the Northeastern U.S. was at a critical low point. It quickly rebounded, however, following restocking efforts, game laws, and seasonal hunting restrictions. The deer population experienced further growth during the early 20th century with agricultural practices creating a constant supply of high quality food and a lack of natural predators such as wolves and mountain lions to cull the herd. Reductions in recreational hunting have further reduced deer mortality, and where it continues New Jersey's highly developed landscape limits hunter access to deer due to safety concerns.

As generalist herbivores, deer preferentially feed upon favored tree and shrub seedlings and/or saplings that can reduce the diversity and abundance of flowering plants. Damage can be so severe in some places that many ecologists and forest biologists consider the over abundant

deer population to be the single greatest threat to the ecological health of Northeastern forests.

Scientists are also learning that too many deer can affect bee population and health. In the early spring, bees forage in northeastern forests to take advantage of the first wildflowers in the understory. Competition from invasive plant species (which deer often avoid) and high levels of deer browsing in some forests have decimated understory wildflower diversity. The impacts of this loss on bee communities is the subject of ongoing studies in the park and elsewhere.

Deer can also potentially impact human health by helping to create havens for deer ticks, the tick that spreads lyme disease. A number of studies have found much higher densities of deer ticks as well as higher incidence of ticks carrying lyme disease in barberry thickets than non-infested forests. This occurs, it is thought, because barberry thickets increase tick habitat (they generally stay within the leaf litter) by creating a humid microclimate throughout the height of the plants. With ticks throughout the thicket, they can more easily find animals and/or humans moving through the thickets, and therefore have a higher chance of getting/transmitting lyme.



White-tailed deer have become a nuisance species in the Northeast because of over browsing pressures. Gerry Tuchodi photo.

How NETN is Helping to Paint a Clearer Picture

Because of their direct experience with these topics, NETN staff participated as part of the Science Advisory Team for Morristown NHP's Vegetation & Deer Plan/Environmental Impact Statement (EIS) and an invasive plant plan that will be an appendix to the Plan/EIS. Park officials had long realized that deer were impacting natural systems, but just how much they are is being made that much more apparent when Morristown is compared with other parks in the Network in annual NETN forest health reports. This monitoring data was used to justify the need for deer and invasive species management, and will continue to be used to assess the effectiveness of management in the future. NETN monitoring data is also helping to inform the aforementioned bee study where some of its study plots have been co-located with NETN forest health study plots.



More Information

NETN Forest Health Monitoring web page:

<http://go.nps.gov/forestHealth>

Morristown NHP 2014 Forest Health Monitoring **Resource Brief:**

<http://go.nps.gov/morr>

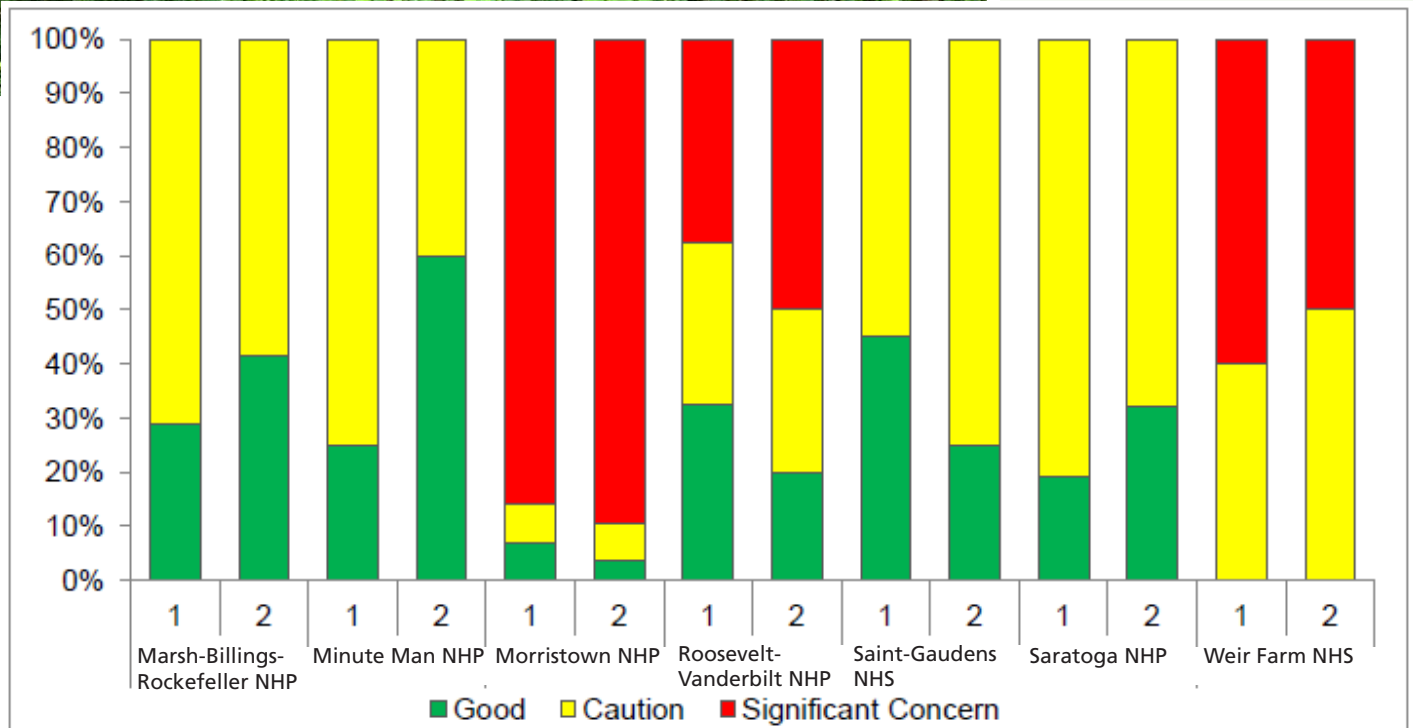
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Left: The NETN forest health monitoring crew takes measurements in Morristown NHP. They are surrounded by Japanese Barberry, an invasive species that deer avoid and that chokes out native plants, trees, and wildflowers. NPS photo.



Above: When compared with other Network parks, it becomes very clear just how much deer and invasive plants seem to be impacting the forests of Morristown NHP. The bar chart above illustrates the ranking of park forest health study plots for tree regeneration in cycles 1 (2006-2009) and 2 (2010-2013). With dense clusters of invasive plants preventing tree seeds from sprouting and deer consuming most young tree saplings that do manage to grow, forest regeneration in Morristown is not taking place as it would in a properly functioning forest ecosystem.



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