

An alternative to climate change for explaining species loss in Thoreau's woods

Willis et al. (1) concluded that climate change significantly contributed to plant species decline in the Concord, MA, area. An alternative explanation is that herbivory by white-tailed deer (*Odocoileus virginianus*) may have been responsible for many of the decreases in species abundance that they observed, and this is a more powerful and parsimonious explanation than increased local temperatures. During their reference time period of 1888–1902, deer were completely absent from the Concord landscape and had been absent for several decades, including Thoreau's era (2), because of historic year-round hunting coupled with extensive habitat clearing. Deer populations recovered during the 20th century; during Willis et al.'s (1) 2003–2007 floral surveys, deer densities were likely between 5.7 and 9.6 km⁻¹, with locally higher concentrations in the protected areas that comprise much of the Concord landscape. Deer at these densities have been demonstrated to have significant effects on plant species diversity and abundance (3). Many of the plant species groups listed as most reduced in their surveys (dogwoods, lillies, many orchids, trilliums) are groups that deer prefer (3, 4).

Willis et al. (1) made the point that the decreases that they observed in plant species abundance occurred despite the fact that 60% of the Concord area landscape has been formally protected or remained undeveloped. However, they failed to consider that much of that protected landscape has not been open to deer hunting. Failure to manage deer through hunting (i.e., predation) can lead to deer herbivory driving plant community dynamics. Thus, simple protection of land from development does not necessarily equate to a consequent protection of ecosystem function or integrity (5).

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