

Part SIX: References for Deer Management and Forest Health

State and Cornell University Deer Management Programs

NH: 1) [Deer Hunting information](#) about rules, links to FAQ, hunting records
The [NH Big Game Plan](#) for 2015-2026 outlines management goals and objectives for deer on pages 5-9. This plan was updated and adopted in 2015.
LINK <http://www.wildlife.state.nh.us/hunting/documents/game-mgt-plan.pdf>

2) Report prepared for the updated deer management plan, [NH White Tail Deer Assessment 2015](#) with details on hunting history, issues and statistics. <http://www.wildlife.state.nh.us/hunting/documents/nh-deer-assessment-2015.pdf>

3) [Science Behind the NH Deer Management Program](#) This report covers the debate for and against antler restrictions and the reason for doe restrictions in some wildlife management units.

VT: 1) [Deer hunting facts](#), deer information, FAQ and links to Management Plan.
http://www.vtfishandwildlife.com/hunt/white-tailed_deer

2) The 2010-2020 Wildlife Management Plan, [Chapter Two](#) for Deer:
<http://www.vtfishandwildlife.com/common/pages/DisplayFile.aspx?itemId=111727>

3) [VT report to Legislature on deer damage \(2012\)](#) Appendix A has an excellent chart of plants susceptible to deer browse and associated increasing levels of damage, from minor to extreme. Appendix C lists forestry practices that help reduce deer damage.
<http://www.vtfishandwildlife.com/common/pages/DisplayFile.aspx?itemId=111619>

NY: 1) [An Integrated Approach for Managing White-Tailed Deer in Suburban Environments:](#)
The Cornell University Study. 2014 Report on the Cornell deer control experience, experiments and observations. Includes tips called "A Deer Manager's Toolbox".
http://wildlifecontrol.info/deer/Documents/IDRM_12-5-2014.pdf

2) [Cornell Plantations Deer Management Program](#) Details on program for deer management on more than 40 natural areas, totaling 4000 acres.
<http://www.cornellplantations.org/our-gardens/natural-areas/stewardship/deer>

3) [Management Plan for Deer in New York State 2012-2016](#). The 5-year plan for deer management allows significant flexibility for deer management in areas with severe deer browse.

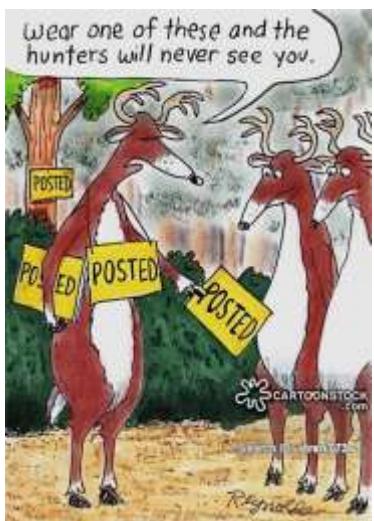


To protect wildflowers, Cornell Plantations installed a 12' deer fence.

General References on Deer and their Impacts

- Crystal, Daniel. 2012. *Why Bambi Must Go*. NY Times. Describes deer impacts on certain birds.
Link: <http://www.nytimes.com/2012/05/19/opinion/why-bambi-must-go.html>
- Purcell, Alan. 2013 *Too Many Deer: A Bigger Threat to Eastern Forests than Climate Change?* The Nature Conservancy, Cool Green Science, August 22, 2013. This article by a TNC researcher argues that the negative impacts of deer on northeastern forests are an even bigger threat than climate change.
Link: <http://blog.nature.org/science/2013/08/22/too-many-deer/>

- Rawinski, Tom. 2008 *Impacts of White-Tailed Deer Overabundance in Forest Ecosystems: An Overview*. This article summarizes the impacts that deer have on forest understory, forest diversity, seed banks, and invasive species and has an extensive list of references.
Link: http://www.na.fs.fed.us/fhp/special_interests/white_tailed_deer.pdf
- Bodin, Madeline. 2010 *Too Many Whitetails?* Northern Woodlands. How many is too many? A good overview of management challenges.
Link: <http://northernwoodlands.org/articles/article/too-many-white-tails>



- Sterba, J. 2012. *America Gone Wild*, Jim Sterba, Wall Street Journal, Nov 2, 2012. Sterba, author of the book "Nature Wars," discusses the amazing resurgence of wildlife in America and the problems that it has created for suburbanites.
- Sterba, J. 2012. *Nature Wars: The Incredible Story of How Wildlife Comebacks Turned Backyards into Battlegrounds*. Crown Publishers, NY.
- Cambronne, A. 2012. *Deerland: America's Hunt for Ecological Balance and the Essence of Wildness*. Headwaters Communications, CT.
- Stolzenburg, William. 2008 *Where the Wild Things Were: Life, Death and Ecological Wreckage in a Land of Vanishing Predators*. Bloomsbury. The book introduces the reader to many of the researchers and issues in current Conservation Biology, and the key role of predators in establishing a 'balance' in regulating biological systems. On deer, see the chapter titled 'Bambi's Revenge'. Available at Howe Library

How to Identify Signs of Deer Over-browse / gardening with deer in mind

- Rawinski, Tom. 2014 *White-tailed Deer in Northeastern Forests: Understanding and Assessing Impacts*. A useful tutorial for assessing sign of deer browse, lists of plants preferred by deer, and determining level of damage, assessing sign of deer browse, lists of plants preferred by deer, and determining level of damage.
Link: http://www.na.fs.fed.us/pubs/2014/NA-IN-02-14_WhitetailedDeerNEForestsWEB.pdf
- [VT report to Legislature on deer damage \(2012\)](http://www.vtfishandwildlife.com/library/Reports_and_Documents/Fish_and_Wildlife/Deer_Damage_Working_Group_Legislative_Report.pdf) Appendix A of this report has an excellent chart of plants susceptible to deer browse and associated increasing levels of damage, from minor to extreme. Link: http://www.vtfishandwildlife.com/library/Reports_and_Documents/Fish_and_Wildlife/Deer_Damage_Working_Group_Legislative_Report.pdf
- [Caring for Deer and Forests](http://www.deerandforests.org/home) A resource center for Eastern North America and under the Resources section an extensive list of research on this topic for the Northeast. Check out the excellent [Habitat Interactive Tutorial](http://www.deerandforests.org/home) that illustrates various levels of browse. Website Link: <http://www.deerandforests.org/home> and the tutorial link: <http://www.deerandforests.org/habitat>
- The Quality Deer Management Association (QDMA) has developed browse survey for helping determining effects of deer on certain forest trees. Link: <https://www.qdma.com/uploads/pdf/Browse-Impact-Surveys.pdf>
- *Clausen, Ruth Rogers (2011) 50 Beautiful Deer-Resistant Plants* Timber Press. NOTE: While the book outlines a useful strategy, it book suggests a LOT of non-native plants. Some of the suggested plants are not adapted for our USDA zone (4). Not too helpful in this regard, since it includes some that have invasive potential. Available at Howe Library
- For more detail about deer behavior, plant preferences, and vegetation analysis, check out Tom Rawinski's 2014 handbook for deer damage assessment:
Link: http://www.na.fs.fed.us/pubs/2014/NA-IN-02-14_WhitetailedDeerNEForestsWEB.pdf
- Rutgers University has a comprehensive list of garden plants, including grasses, ferns, shrubs and trees. The list is organized by deer preference. Some plants may not be cold-hardy for use in Northern New England. <http://njaes.rutgers.edu/deerresistance/> A PDF file of the list can be downloaded from this site. Some of the

listed plants, such as Russian olive, Norway maple and Japanese barberry, are considered invasive in NH and VT.

Research on Deer Impacts on Forest Health

- [In a long-term experimental demography study, excluding ungulates reversed invader's explosive population growth rate and restored natives.](http://www.pnas.org/content/early/2014/03/05/1310121111) Kalisz et al (2014). This article reports on how invasive garlic mustard is reduced when native plants are not over-browsed by deer.
Link: <http://www.pnas.org/content/early/2014/03/05/1310121111>
- [Deer Browsing Delays Succession by Altering Aboveground Vegetation and Belowground Seed Banks.](http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0091155) DiTommaso et al (2014) From the abstract of this article: "In late October of each of six years (2005–2010), we collected soil from each plot and conducted seed germination cycles in a greenhouse to document seed bank composition. These data were compared to measurements of aboveground plant cover (2005–2008) and tree density (2005–2012). The impacts of deer browsing on aboveground vegetation were severe and immediate, resulting in significantly more bare soil, reduced plant biomass, reduced recruitment of woody species, and relatively fewer native species. These impacts persisted throughout the experiment. The impacts of browsing were even stronger on seed bank dynamics. Browsing resulted in significantly decreased overall species richness (but higher diversity), reduced seed bank abundance, relatively more short-lived species (annuals and biennials), and fewer native species. Both seed bank richness and the relative abundance of annuals/biennials were mirrored in the aboveground vegetation. Thus, deer browsing has long-term and potentially reinforcing impacts on secondary succession, slowing succession by selectively consuming native perennials and woody species and favoring the persistence of short-lived, introduced species that continually recruit from an altered seed bank."
- Jenkins, LH et al. 2014 *Herbaceous layer response to 17 years of controlled deer hunting in forested natural areas.* Biological Conservation Volume 175, July 2014, Pages 119–128. This study found that browse-sensitive functional groups increased in cover while that of exotic species decreased, as a result of recovery that occurred following sustained hunting. Tree seedlings displayed a six-fold increase in cover within parks between sample intervals.
Link: <http://www.sciencedirect.com/science/article/pii/S0006320714001736>
- DeCalesta, DS. 1994. *Deer and diversity in Allegheny Hardwood Forests: managing an unlikely challenge.* (1994) Landscape and Urban Planning, 23 (1994) 47-53. This article describes the Allegheny Project, a critical ten-year study for USDA forests in PA and NY that started in 1979, where deer densities were kept at constant level so as to observe the effect on understory vegetation. This report states critical deer density for forest vegetation: 4-8 deer/km² or 10-20 deer/mi²
Link: <http://www.deerandforests.org/resources/deer-and-diversity-in-allegheny-hardwood-forests.pdf>
- Research on the *Effect of Deer Population Levels on Natural Regeneration of Allegheny Hardwoods*, a long-term study of deer exclosures in PA forests. <http://www.fs.fed.us/ne/global/ltedb/catalogs/cat50.html>
- Nuttle, T., A.A. Royo, M.B. Adams, and W.P. Carson. 2013. *Historic disturbance regimes promote tree diversity only under low browsing regimes in eastern deciduous forest.* Ecological Monographs 83(1): 3-17.
- Nuttle, Tim et al. (2014) "Long-term biological legacies of herbivore density in a landscape-scale experiment: forest understoreys reflect past deer density treatments for at least 20 years" Journal of Ecology 2014, 102, 221–228 <http://www.cecinc.com/miscDocs/nuttle2013.pdf>
- Royo, A.A., S.L. Stout, D.S. deCalesta, T.G. Pierson. 2010. *Restoring forest herb communities through landscape-level deer herd reductions: Is recovery limited by legacy effects?* Biological Conservation 143: 2425-2434.
- Royo, Alejandro et al. "Pervasive interactions between ungulate browsers and disturbance regimes promote temperate forest herbaceous diversity" Ecology, 91(1), 2010, pp. 93–105 Link:

<http://www2.dnr.cornell.edu/ext/forestconnect/web/10-21-09/Deer%20and%20disturbance%20interactions.Royo.Ecol.inpress2009.pdf>

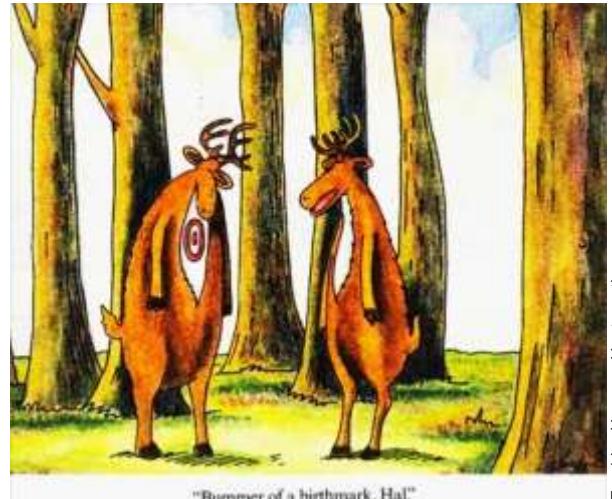
- Waller DM, Alverson WS. 1997. *The white-tailed deer: A Keystone Herbivore*. Wildlife Society Bulletin, 25(2): 217-226 This article is considered a classic on this topic. Link <http://www.jstor.org/stable/3783435>

Deer and Spread of Invasive Plants

- Rawinski, Tom. (2008) *Impacts of White-Tailed Deer Overabundance in Forest Ecosystems: An Overview*. A summary article on this topic by Tom Rawinski (USFS) This article has long list of references, some of them attest to deer's contribution to the spread of invasive plants.
Link: http://www.na.fs.fed.us/fhp/special_interests/white_tailed_deer.pdf
- Knight, T.M., J.L. Dunn, L.A. Smith, J. Davis, and S. Kalisz. 2009. *Deer facilitate invasive plant success in Pennsylvania forest understory*. Natural Areas Journal 29(2): 110-116.
link: <http://www.bioone.org/doi/pdf/10.3375/043.029.0202>
- Williams, SC; Ward, J.S. 2006. *Exotic seed dispersal by white-tailed deer in southern Connecticut*. Natural Areas Journal. 26(4): 383–390.
- Lefcort,H and Pettoello, CL. 2012 *White-Tailed Deer Trails are Associated with the Spread of Exotic Forbs*. Natural Areas Journal, 32(4):159-165. <http://www.bioone.org/doi/pdf/10.3375/043.032.0204>
- NRCS NJ Biology Technical Note: *White-tailed Deer Impacts and Forest Management*
"This selective preference for certain flora ultimately causes a shift in the plant community on the forest floor and can also facilitate the colonization of invasive and non-native plants. Invasive species that are avoided by deer include Japanese stiltgrass (*Microstegium vimineum*), garlic mustard (*Alliaria petiolata*), Japanese barberry (*Berberis thunbergii*), and multiflora rose (*Rosa multiflora*). These may be sampled by deer, but they are relatively unaffected."
http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs141p2_017980.pdf
- Baiser B, Lockwood JL, La Puma D, Aronson, MFJ. 2008. *A perfect storm: two ecosystem engineers interact to degrade deciduous forests of New Jersey* Biological Invasions. 10:785–795 The engineers in this article are deer & Japanese stilt grass. http://www.rci.rutgers.edu/~hmforest/2008_3.pdf

Strategies for Managing Deer

- Jenkins, LH et al. (2014), *Herbaceous layer response to 17 years of controlled deer hunting in forested natural areas*. Biological Conservation Vol 175, July 2014, Pages 119-128.
<http://www.sciencedirect.com/science/article/pii/S006320714001736>
- *Managing Urban Deer in CT: A guide for Residents and Communities* (2007) outlines many possible measures to help reduce the density of a deer herd. Connecticut Bureau of Natural Resources / Wildlife
http://www.ct.gov/dep/lib/dep/wildlife/pdf_files/guide/urbandeer07.pdf
- Fairfield County (CT) Deer Management Alliance. *Case studies of successful community-managed deer control*. <http://www.deeralliance.com/node/77>
See <http://www.deeralliance.com/node/69> for a description of the Special Permits available in Connecticut under CT Public Act 03-192 that implements Deer Herd Reduction Programs in problem areas and for nuisance deer, or where recreational hunting has failed to reduce numbers. Information about processing deer meat in CT at <http://deeralliance.com/node/68>



"Bummer of a birthmark, Hal."

- *Community-Based Deer Management* (2004) Daniel J. Decker, Daniela B. Raik, and William F. Siemer Cornell University. <http://wildlifecontrol.info/pubs/Documents/Deer/DeerGuide.pdf>
- *Hopewell Valley NJ Deer Management Plan* (2010) covers a 3-town region. http://deerinbalance.files.wordpress.com/2010/10/final_deer_task_force_report_0927101.pdf
- A comprehensive website devoted to deer is *Living with White-tailed Deer in Illinois*, it covers many issues related to management and reducing a deer herd -- <http://web.extension.illinois.edu/deer/about.cfm> For hunting practices with best results, see Deer Management see the *Guidelines for Landowners Considering Hunting or Leasing for Deer Control* go to <http://web.extension.illinois.edu/deer/yourrole.cfm?SubCat=9118>
- Information about the Illinois permits for herd reduction: http://web.extension.illinois.edu/wildlife/permit_deer_special.cfm#dpcp
- See part TWO of this Deer Management and Forest Health website, and the remarks by Todd Bittner at the Sept 8 2014 meeting, for a detailed description of these deer control measures at Cornell Plantations.
- *Kinzua Quality Deer Cooperative*: Hunting tips for the 74,000-acre Kinzua cooperative lands in PA. <http://kqdc.com/hunt-the-kqdc/> This cooperative of landowners for has been managing deer since 2000 and achieved adequate control within 5 years using continued annual efforts and selective practices by selected hunters.
- Information about the Wisconsin Deer Management Assistance Program that assists landowners with a deer population problem, <http://dnr.wi.gov/topic/wildlifehabitat/DMAP.html>
- A 2014 report from APHIS/USDA evaluates an experiment on deer control on Long Island that covered 24 nearly contiguous properties. http://www.aphis.usda.gov/wildlife_damage/downloads/nepa/2014%20East%20End%20Deer%20Damage%20Management%20Report.pdf
- A survey of bow-hunters *Assessing Strategies to Improve Bowhunting as an Urban Deer Management Tool* HJ Kilpatrick, AM LaBonte, JS and G Warner. *Wildlife Society Bulletin*, Vol. 32, No. 4 (Winter, 2004), pp. 1177-1184
- *Factors Affecting Bowhunter Access in Suburban Areas*. HJ Kilpatrick, AM Labonte and JS Barclay. *The Journal of Wildlife Management*, Vol. 71, No. 6 (Aug., 2007), pp. 2102-2105
- Information about NH hunter education classes. <http://www.wildlife.state.nh.us/hunting/hunter-ed.html>
- *Use of Bait to Increase Archery Deer Harvest in an Urban-Suburban Landscape*. HJ Kilpatrick, AM Labonte and JS Barclay. *The Journal of Wildlife Management*, Vol. 74, No. 4 (May 2010), pp. 714-718
- For a discussion on the psychology of hunting efforts, see *Effort and the Functional Response of Deer Hunters*. TR VanDeelen, DR Etter. 2003. *Human Dimensions of Wildlife*, 8:97-108.
- Are deer aware that the hunting season is underway? See the essay on the topic of deer stands and deer awareness of hunting efforts. Author Clint McCoy is a deer biologist with the Ohio Division of Wildlife. <https://www.qdma.com/articles/how-fast-can-a-stand-recover-from-hunting-pressure>
- Would a market in venison help regulate deer density? See this discussion: *Regulated Commercial Harvest to Manage Overabundant White-Tailed Deer: An Idea to Consider?* KC VerCauteren, CW Anderson, TR Van Deelen et al. 2011 *Wildlife Society Bulletin* 35(3):185-194; 2011; DOI: 10.1002/wsb.36
- A description of the PA hunting program to reduce deer density, see Deer Management Assistance Program (DMAP) under the 'deer hunting' section of <http://www.portal.state.pa.us/portal/server.pt/community/deer/11949>