# References



# **GLOSSARY**

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#### Α

**Abundance.** Relative representation of a species in a given area or ecosystem.

Action alternative. An alternative that proposes a different management action or actions to address the purpose, need, and objectives of the plan; one that proposes changes to the current management. Alternatives B, C, and D are the action alternatives in this planning process. See also: "no-action alternative."

Adaptive management. The rigorous application of management, research, and monitoring to gain information and experience necessary to assess and modify management activities. A process that uses feedback from research and the period evaluation of management actions and the conditions they produce to either reinforce the viability of objectives, strategies, and actions prescribed in a plan or to modify strategies and actions in order to more effectively accomplish management objectives.

**Affected environment**. A description of the existing environment that may be affected by the proposed action.

**Archeological resources.** Any material remains or physical evidence of past human life or activities which are of archeological interest, including the record of the effects of human activities on the environment. Archeological resources are capable of revealing scientific or humanistic information through archeological research.

# В

**Biobullet.** A single dose, biodegradable projectile comprised of an outer methylcellulose casing containing a solid, semi-solid, or liquid product (usually a vaccine or chemical contraceptive), propelled by a compressed-air gun.

Biodiversity. The number and variety of organisms found within a specified geographic region.

**Birth rate.** Demographic measure of the rate at which offspring are born.

**Browse line.** A visible delineation at approximately 6 feet below which most or all vegetation has been uniformly browsed.

#### C

**Carrying capacity.** The maximum number of organisms that can be supported in a given area or habitat.

Cervids. All members of the Cervidae family and hybrids, including deer, elk, and moose.

Chronic wasting disease (CWD). A slowly progressive, infectious, self-propagating neurological disease of captive and free-ranging deer, elk, and moose. CWD belongs to the transmissible spongiform encephalopathy (TSE) group of diseases and is characterized by accumulations of abnormal prion proteins in neural and lymphoid tissue.

**Contractor.** For the purposes of this plan, a contractor is a fully-insured business entity, nonprofit group, or other governmental agency engaged in wildlife management activities that include trapping, immobilization, and lethal removal through sharpshooting and chemical euthanasia. The contractor must possess all necessary permits and be able to pass any needed security clearances.

**Contragestive.** A product that prevents or terminates pregnancy.

**Cultural landscape.** A geographic area (including both cultural and natural resources and the wildlife therein) associated with a historic event, activity, or person or exhibiting other cultural or aesthetic values.

Cumulative impacts. Those impacts on the environment that result from the incremental effect of the action when added to the past, present, and reasonable foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

# D

**Deer population.** The group of deer living within Fire Island National Seashore that have common characteristics and interbreed among themselves.

**Demographic.** Referring to the intrinsic factors that contribute to a population's growth or decline: birth, death, immigration, and emigration. The sex ratio of the breeding population and the age structure (the proportion of the population found in each age class) are also considered demographic factors because they contribute to birth and death rates.

**Depredation.** Deer browsing that leads to vegetation damage or loss.

**Direct lethal reduction.** For the purposes of this plan, direct lethal reduction is the removal of deer through a combination of sharpshooting, and capture and euthanasia, and public hunting.

**Dispersal.** One-way and permanent movement of animals from an area of birth to another.

# Ε

**Ecosystem.** An ecological system; the interaction of living organisms and the nonliving environment, producing an exchange of materials and energy between the living and nonliving.

**Endemic.** Native to or confined to a particular region.

**Environment.** The sum total of all biological, chemical, and physical factors to which organisms are exposed; the surroundings of a plant or animal.

Environmental assessment (EA). A concise public document, prepared in compliance with NEPA, that briefly discusses the purposes and need for an action, and provides sufficient evidence and analysis of impacts to determine whether to prepare an environmental impact statement or finding of no significant impact.

Environmental consequences. Environmental effects of project alternatives, including the proposed action, any adverse environmental effects which cannot be avoided, the relationship

between short term uses of the human environment, and any irreversible or irretrievable commitments of resources which would be involved if the proposal should be implemented.

Environmental impact statement (EIS). A detailed written statement required by Section 102(2)(C) of the National Environmental Policy Act, analyzing the environmental impacts of a proposed action, adverse effects of the project that cannot be avoided, alternative courses of action, short term uses of the environment versus the maintenance and enhancement of long term productivity, and any irreversible and irretrievable commitment of resources.

Environmental Justice. Environmental justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.

**Ethnographic resource.** Any site, structure, object, landscape, or natural resource feature assigned traditional legendary, religious, subsistence, or other significance in the cultural system of a group traditionally associated with it.

**Euthanasia.** Ending the life of an animal by humane means.

**Exclosure.** An area enclosed by a barrier, such as a fence, to protect vegetation and prevent browsing by animals.

Exotic species (or nonnative invasive species). Any introduced plant, animal, or protist species that is not native to the area and may be considered a nuisance; also called nonnative, invasive, or alien species.

#### F

**Fertility control.** In this plan/EIS, the use of immunocontraceptive agent to manage population growth.

**Forest regeneration.** For the purposes of this plan, the regrowth of forest species and renewal of forest tree cover such that the natural forest sustains itself without human intervention.

# Н

**Habitat.** The environment in which a plant or animal lives (includes vegetation, soil, water, and other factors).

Herbaceous plants. Non-woody plants; includes grasses, wildflowers, and sedges and rushes (grass-like plants).

**Herbivore.** An animal that eats a diet consisting primarily of plant material.

Historic Structures. A constructed work, usually immovable by nature or design, consciously created to serve some human act. To be listed on or eligible for listing on the National Register, a site, structure, object, or district must possess historic integrity of those features necessary to convey its significance, particularly with respect to location, setting, design, feeling, association, workmanship, and materials.

Home range. The geographic area in which an animal normally lives.

#### ı

**Immunocontraception.** The induction of contraception by injecting an animal with a compound that produces an immune response that precludes pregnancy.

**Immunocontraceptive.** A contraceptive agent that causes an animal to produce antibodies against some protein or peptide involved in reproduction. The antibodies hinder or prevent some aspect of the reproductive process.

**Indian Trust resources.** The federal Indian Trust responsibility is a legally enforceable obligation on the part of the United States to protect tribal lands, assets, resources, and treaty rights, and it represents a duty to carry out the mandates of federal laws with respect to Native American tribes.

**Infrared.** The range of invisible radiation wavelength just longer than the red in the visible spectrum.

**Irretrievable.** A term that applies to the loss of production, harvest, and consumptive or nonconsumptive use of natural resources. For example, recreation experiences are lost irretrievably when an area is closed to human use. The loss is irretrievable, but the action is not irreversible. Reopening the area would allow a resumption of the experience.

**Irreversible.** A term that describes the loss of future options. Applies primarily to the effects of use of nonrenewable resources, such as minerals or cultural resources, or to those factors, such as soil productivity that are renewable only over long periods of time.

#### L

**Lethal reduction.** The purposeful authorized killing of (an) animal(s) to achieve park management objectives.

### M

Managed hunt. A special/managed hunt is one in which the government entity allows a certain number of citizen hunters to take a certain number of deer pursuant to specific requirements. Sometimes these hunts include firearm proficiency tests, hunting in specific areas or stands, and taking specific cohorts. Typically, these hunts take place during the state's sport hunting season and last for several days.

**Monitoring.** A process of collecting information to evaluate if an objective and/or anticipated or assumed results of a management plan are being realized (effectiveness monitoring) or if implementation is proceeding as planned (implementation monitoring).

**Myopathy.** A non-infectious disease of wild and domestic animals in which muscle damage results from extreme exertion, struggle, or stress.

#### Ν

National Environmental Policy Act of 1969 (NEPA), as amended. A law that requires all federal agencies to examine the environmental impacts of their actions, incorporate environmental information, and utilize public participation in the planning and implementation of all actions. Federal agencies must integrate NEPA with other planning requirements and prepare appropriate NEPA documents to facilitate better environmental decision making. NEPA requires federal agencies to review and comment on federal agency environmental plans/documents when the

agency has jurisdiction by law or special expertise with respect to any environmental impacts involved.

**Naturally regenerating and sustainable forest.** A forest community that has the ability to maintain plant and animal diversity and density by natural (non-human facilitated) tree replacement.

**No-action alternative.** The alternative in which baseline conditions and trends are projected into the future without any substantive changes in management. Alternative A is the no-action alternative in this planning process.

#### Ρ

**Palatable.** The property of being acceptable to the taste or sufficiently agreeable in flavor to be eaten.

**Parasitism.** A symbiotic relationship in which one species, the parasite, benefits at the expense of the other, the host.

**Penetrating captive bolt gun.** A gun with a steel bolt that is powered by either compressed air or a blank cartridge. When fired, the bolt is driven into the animal's brain and renders it instantly unconscious without causing pain.

Pericardial. Around or surrounding the heart.

**Population (or species population).** A group of individual plants or animals that have common characteristics and interbreed among themselves and not with other similar groups.

**Population dynamics.** All the elements of change by which a particular population exists such as mortality, reproduction, and movement.

**Predator restoration.** The method of reintroducing natural predators as a means of controlling a highly dense population.

**Productivity.** Number of fawns born minus those killed through all sources of mortality at a given population size.

#### R

Radial distance. A straight-line distance measured along a radius.

**Record of decision (ROD).** A concise public record of decision prepared by a federal agency, pursuant to NEPA, that contains a statement of the decision, identification of all alternatives, a statement as to whether all practical means to avoid or minimize environmental harm from the alternative selected have been adopted (and if not, why they were not), and a summary of monitoring and enforcement where applicable for any mitigation.

**Regulated** (traditional) hunting. Killing, trapping, or capture of animals as allowed by law.

Reproductive control. See fertility control.

**Reproductive intervention.** A method or methods used to limit the numbers of animals in a population by decreasing the reproductive success of the animals, such as contraception or sterilization.

Reproductive rate. Number of fetuses per doe.

**Rut.** An annually recurring condition or period of sexual excitement and reproductive activity in deer; the breeding season.

# S

**Sacred Sites.** Places containing certain natural and cultural resources which have established religious meaning and are used as locales of private ceremonial activities.

Sapling. A young tree, generally not over 4 inches in diameter at breast height.

**Scoping.** An early and open process for determining the extent and variety of issues to be addressed and for identifying the significant issues related to a proposed action.

Seedling. A young plant grown from seed; a young tree before it becomes a sapling.

**Sex ratio.** The proportion of males to females (or vice versa) in a population. A sex ratio of 50:50 would mean an equal number of does and bucks in a deer population.

**Sharpshooting.** The authorized shooting of animals by specially trained professionals using appropriate weapons for means of effective and efficient lethal control.

Special-status Species. Special-status species include plant and animal species that have regulatory protection under current federal and state laws. Federal protection is afforded through the Endangered Species Act of 1973 (ESA), which is administered by the U.S. Fish and Wildlife Service and the National Marine Fisheries Service.

The U.S. Fish and Wildlife Service defines an "endangered" species as one that is in danger of extinction throughout all or a significant portion of its range. A "threatened" species is one that is likely to become endangered in the foreseeable future. The agency maintains a list of plants and animals native to the U.S. that are ESA candidates or are proposed for possible addition to the federal list.

**Species diversity.** The variety of different species present in a given area; species diversity takes into account both species richness and the relative abundance of a species.

Species richness. The number of species present in a community.

**Spotlight counts.** A method used to estimate deer numbers in an area by shining spotlights at night and counting the number of deer observed. This technique provides an estimate of deer numbers but not density.

Subcutaneous. Under the skin.

# Т

**Translocation.** The method of sedating, capturing, and moving deer from one location to another. Under alternative B in this plan/EIS, deer would be translocated from the Fire Island communities west of Sailors Haven to the Fire Island Wilderness.

# U

Ungulate. A hoofed, typically herbivorous, animal; includes horses, cows, deer, elk, and bison.

# V

**Vaccine.** A suspension of killed or attenuated microorganisms that, when introduced into the body, stimulates an immune response against that microorganism.

**Vascular plant.** A plant that contains a specialized conducting system consisting of phloem (food-conducting tissue) and xylem (water-conducting tissue). Ferns, trees, and flowering plants are all vascular plants.

**Viable white-tailed deer population.** A population of deer that allows the forest to naturally regenerate, while maintaining a healthy deer population in the park.

# W

Woody plants. Plants containing wood fibers, such as trees and shrubs.

REFERENCES

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# **SELECTED BIBLIOGRAPHY**

# SELECTED BIBLIOGRAPHY

- Allombert S., S. Stockton, and J. Martin
  - "A natural experiment on the impact of overabundant deer on forest invertebrates." Conservation Biology 19(6): 1917-1929.
- Anderson, R. C., and O. L. Loucks
  - 1979 "White-tailed Deer (*Odocoileus virginianus*) Influence on Structure and Composition of *Tsuga canadensis* Forests." *Journal of Applied Ecology* 16:855-861.
- Animal and Plant Health Inspection Service (APHIS), United States Department of Agriculture

  2008 E-mail message from Gino D'Angelo, Wildlife Biologist, USDA-APHIS to Kristina
  Heister, Valley Forge NHP Natural Resource Manager, August 6, 2008, regarding
  estimated costs for deer removal and reproductive treatment.
- Animal Protection Institute (API)
  - 2000 *Humane Ways to Live with Deer*. http://www.all-creatures.org/aip/nl-14nov2000.html (accessed February 2014).
- Art, H. W.
  - 1976 Ecological Studies of the Sunken Forest Fire Island National Seashore, New York. National Park Service, Scientific Monogram Series, No. 7.
  - The Impacts of Hurricane Gloria, Deer and Trails, the Sunken Forest, Fire Island National Seashore, NY. Final Report to the North Atlantic Regional Office, National Park Service.
  - The Impacts of Deer on the Sunken Forest and Fire Island National Seashore, Fire Island, NY, 1967-1989.
  - 1992 Fire Island Deer-Vegetation Study Herb Layer Data. September 15, 1992.
  - 1993 *1992 Eastern Native Plant Alliance Deer/Native Plant Interaction Survey.* 6th Annual General Meeting. September 24-26.
  - 1995 *Deer/Vegetation Management Issues at FIIS.* North Atlantic Region, National Park Service. August 10, 1995.

#### Audubon

- 2014 *Northern Harrier (Circus cyaneus)*. http://birds.audubon.org/birds/northern-harrier. (Accessed on June 27, 2014).
- Augustine, D. J., and D. S. deCalesta
  - "Defining Deer Overabundance and Threats to Forest Communities: From Individual Plants to Landscape Structure." *Ecoscience* 10(4):472-486.
- Augustine, D. J. and L. E. Frehlich
  - "Effects of White-tailed Deer on Populations of an Understory Forb in Fragmented Deciduous Forests." *Conservation Biology* 12(5):995-1004.
- Baker, D. L., M. A. Wild, M. M. Connor, H. B. Ravivarapu, R. L. Dunn, and T. M. Nett

  2002 "Effects of GnRH Agonist (Leuprolide) on Reproduction and Behavior in Female
  Wapiti (Cervus elaphus nelsoni)." *Reproductive Supplement* 60:155-67.
  - "Gonadotropin-Releasing Hormone Agonist: A New Approach to Reversible Contraception in Female Deer." *Journal of Wildlife Diseases* 40:713-24.

- Berger, J., J. E. Swenson, and I. L. Persson
  - 2001 "Recolonizing Carnivores and Naive Prey: Conservation Lessons from Pleistocene Extinctions." *Science* 291:1036-1039.
- Beringer, J. L., P. Hansen, J. A. Demand, J. Sartwell, M. Wallendorf, and R. Mange
  - "Efficacy of Translocation to Control Urban Deer in Missouri: Costs, Efficiency, and Outcome." *Wildlife Society Bulletin* 30:767-774.
- Bird Nature
  - North American Migration Flyways. http://birdnature.com/flyways.html (accessed November 12, 2013).
- Bishop, P., J. Gilden, M. Lowery, and D. Riehlman
  - 1999 A Citizen's Guide to the Management of White-tailed Deer in Urban and Suburban New York. New York State Department of Environmental Conservation.
- Bormann, B. T., D. C. Lee, A. R. Kiester, D. E. Busch, J. R. Martin, and R. W. Haynes

  2006 "Adaptive Management and Regional Monitoring." Chapter 10 in: R.W. Haynes,
  B.T. Bormann, and J.R. Martin (eds.). Northwest Forest Plan—the First Ten Years

  (1994-2003): Synthesis of Monitoring and Research Results. PNW GTR 651, USDA
  Forest Service, Pacific Northwest Research Station, Portland, OR.
- Boulanger, J. R., P. D. Curtis, E. G. Cooch, and A. J. DeNicola
  - "Sterilization as an alternative deer control technique: a review." *Human-Wildlife Interactions* 6(2):273-282.
- Briggs, N, E. G.Schneider, J. Sones, and K. Puryear
  - 2010 Inventory of Odonata (Dragonflies and Damselflies) at Fire Island National Seashore.
    National Park Service Natural Resource Technical Report NPS/NCBN/NRTR—
    2010/295.
- Buckland, S. T., D. R. Anderson, K. P. Burnham, and J. L. Laake
  - 1993 *Distance Sampling: Estimating Abundance of Biological Populations.* Chapman and Hall, London. 446pp.
- Byman, D.
  - 2011 "The Effects of Deer Exclosures on Voles and Shrews in Two Forest Habitats." *Northeastern Naturalist* 18(4):509-520.
- Campbell, T. A., B. R. Laseter, W. M. Ford, and K. V. Miller
  - "Movements of Female White-tailed Deer (*Odocoileus virginianus*) in Relation to Timber Harvests in Central Appalachians." *Forest Ecology and Management* 199:371-378.
- Centers for Disease Control and Prevention, Department of Health and Human Services (CDC)
  - 2012 *Lyme Disease Prevention and Control.* Available on the Internet at < http://www.cdc.gov/lyme/ >. Accessed July 20, 2012.
  - *Tickborne Diseases of the U.S.* http://www.cdc.gov/ticks/diseases (accessed November 12, 2013).
- Clark, J. S.
  - 1984 Vegetation and Land-Use History of the William Floyd Estate, Fire Island National Seashore, Lond Island, New York. September 1984.
  - 1986 Vegetation and Land-use History of the William Floyd Estate, Fire Island National Seashore, New York. NPS, Office of Scientific Studies Technical Report OSS 86-3.

- Clover, M. R.
  - "Single-gate Deer Trap." *California Fish and Game* 42(3):199-201.
- Coffey, M. A., and G. H. Johnston
  - "A Planning Process for Managing White-tailed Deer in Protected Areas: Integrated Pest Management." *Wildlife Society Bulletin* 1997, 25(2):433-39.
- Collins, R. J., and W. P. Carson
  - "The Fire and Oak Hypothesis; Incorporating the Effects of Deer Browsing and Canopy Gaps." In: Van Sanbeek, J.W., J.O. Dawson, F. Ponder, E. F. Loewenstein, and J. S. Fralish (eds). *Proceedings of the 13th Central Hardwood Forest Conference*, General Technical Report NC-234, North Central Research Station, USDA Forest Service, pp. 43-63.
- Cook, R. P., D, K. Brotherton, and J. L. Behler
  - 2010a *Inventory of Reptiles and Amphibians at Fire Island National Seashore.* National Park Service Natural Resource Report NPS/NCBN/NRTR 2010/378.
  - 2010b Inventory of Reptiles and Amphibians at the William Floyd Estate, Fire Island National Seashore. National Park Service Natural Resource Report NPS/NCBN/NRTR 2010/380.
- Council on Environmental Quality (CEQ)
  - "Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations." Memorandum to Agencies. *Federal Register* 46:18026. March 23.
- Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe
  - 1979 Classification of Wetlands and Deepwater Habitats of the United States. FWS/OBS-79/31. Performed for the U.S. Department of the Interior, Fish and Wildlife Service, Office of Biological Services, Washington, D.C.
- Curtis, P. D., C. Fitzgerald, and M. E. Richmond
  - "Evaluation of the Yard Gard Ultrasonic Yard Protector for Repelling White-tailed Deer." *Eastern Wildlife Damage Control Conference* 7: 172-176.
- Curtis, P. D., R. L. Pooler, M. E. Richmond, L. A. Miller, G. F. Mattfeld, and F. W. Quimby

  "Comparative Effects of GnRH and Porcine Zona Pellucida (PZP)

  Immunocontraceptive Vaccines for Controlling Reproduction in White-tailed Deer

  (Odocoileus virginianus)." Reproduction Supplement 60:131–41.
- Curtis, P.D., S. M. Walker, and D. O. Gilrein
  - 2011 Shelter Island and Fire Island 4-poster Deer and Tick Study. College of Agriculture and Life Sciences, Cornell University.
- deCalesta. D. S.
  - "Effects of White-tailed Deer on Songbirds within Managed Forests in Pennsylvania." *Journal of Wildlife Management* 58(4):711-718.
- DeNicola, A. J., K. C. Vercauteren, P. D. Curtis, and S. E. Hygnstrom

  2000 *Managing White-tailed Deer in Suburban Environments: A Technical Guide*. Cornell

  Cooperative Extension, Cornell University, Ithaca, NY
- DeNicola, A. J., D. J. Kesler, and R. K. Swilhart
  - "Dose Determination and Efficacy of Remotely Delivered Norgestomet Implants on Contraception of White-tailed Deer." *Zoo Biology* 16:31-37.

"Remotely Delivered Prostaglandin F2" Implants Terminate Pregnancy in White-tailed Deer." *Wildlife Society Bulletin* 25:527-31.

# DeNicola, A. J., and R. K. Swihart

"Capture-induced Stress in White-tailed Deer." *Wildlife Society Bulletin* 25(2):500-3.

# Denicola, A. J., S. J. Weber, C. A. Bridges, and J. L. Stokes

1997b "Nontraditional techniques for management of overabundant deer populations." *Wildlife Society Bulletin* 25:496-499.

# Doerr, M. L., J. B. McAnnich, and E. P. Wiggers

"Comparison of Four Methods to Reduce White-tailed Deer Abundance in an Urban Community." *Wildlife Society Bulletin* 29(4):1105-13.

# Dowhan, J. J., and R. Rozsa

"Flora of Fire Island, Suffolk County, New York." *Bulletin of the Torrey Botanical Club* 116(3):265–282.

# Duguay, J. P., and C. Farfaras

"Overabundant Suburban Deer, Invertebrates, and the Spread of an Invasive Exotic Plant." *Wildlife Society Bulletin* 35:243-251.

#### Ecohealth, Inc.

1998 Damminix Tick Tubes Test Results on Fire Island, NY. Unpublished Report to Fire Island Pines, New York.

# Erenfeld, J. G.

"Dynamics and Processes of Barrier Island Vegetation." *Reviews in Aquatic Science* 2: 437-480.

#### Eschtruth, A. K., and J. J. Battles

2008 "Deer Herbivory Alters Forest Response to Canopy Decline Caused by an Exotic Insect Pest." *Ecological Applications* 18(2):360-376.

2009 "Assessing the Relative Importance of Disturbance, Herbivory, Diversity, and Propagule Pressure in Exotic Plant Invasion." *Ecological Monographs* 79(2):265-280.

# Fagerstone, K. A., L. A. Miller, G. Killian, and C. A. Yoder

2010 "Review of issues concerning the use of reproductive inhibitors, with particular emphasis on resolving human-wildlife conflicts in North America." *Integrative Zoology* 1:15-30.

# Federal Emergency Management Agency (FEMA).

1998a Flood Insurance Rate Map Suffolk County, New York (All Jurisdictions). Panel 694 of 1026. Map Number 36103C0694 G.

1998b Flood Insurance Rate Map Suffolk County, New York (All Jurisdictions). Panel 739 of 1026. Map Number 36103C0739 G.

1998c Flood Insurance Rate Map Suffolk County, New York (All Jurisdictions). Panel 912 of 1026. Map Number 36103C0912 G.

#### Forrester, J. A.

2004 *Ecological Dynamics of a Rare Maritime Ilex Opaca Forest.* Doctoral dissertation. SUNY College of Environmental Science and Forestry, Syracuse, NY.

- Forrester, J. A., and D. J. Leopold
  - "Extant and Potential Vegetation of an Old-growth Maritime *Ilex Opaca* Forest." *Plant Ecology* 183: 349-359.
- Forrester, J. A., D. J. Leopold, and H. W. Art
  - 2007 "Disturbance History and Mortality Patterns in a Rare Atlantic Barrier Island Maritime Holly Forest." *Natural Areas Journal* 27(2): 169-182.
- Forrester, J. A., D. J. Leopold, and H. B. Underwood
  - 2006 "Isolating the Effects of White-tailed Deer on the Vegetation Dynamics of a Rare Maritime American Holly Forest." *The American Midland Naturalist*.
  - 2008 The Role of Disturbance in the Long-term Viability of Coastal Maritime Forest Fragment. National Park Service Technical Report NPS/NER/NRTR-2008/104.
- Fraker, M. A.
  - Personal communication between M. A. Fraker and Kristina Heister, Natural Resource Manager, Valley Forge National Historical Park, regarding SpayVac® use in white-tailed deer.
- Fraker, M. A., R. G. Brown, G. E. Gaunt, J. A. Kerr, and B. Pohajdak
  - "Long Lasting Single Dose Immunocontraception of Feral Fallow Deer in British Columbia." *Journal of Wildlife Management* 66(4):1141-47.
- Frost, H. C., G. L. Storm, M. J. Batcheller, and M. J. Lovallo
  - "White-tailed Deer Management at Gettysburg National Military Park and Eisenhower National Historic Site." *Wildlife Society Bulletin* 25(2):462-69.
- Fulton, D. C., K Skerl, E. M. Shank, and D. W. Lime
  - "Beliefs and attitudes toward lethal management of deer in Cuyahoga Valley National Park. *Wildlife Society Bulletin*, 32(4): 1166-1176.
- Ginsberg, H. S.
  - Vector-borne Diseases on Fire Island, New York (Fire Island National Seashore Science Synthesis Paper). National Park Service Technical Report NPS/NER/NRTR-2005/018.
  - 2010 Personal communication. USGS Pattuxent Wildlife Research Center, University of Rhode Island, Kingston, RI.
- Ginsberg, H.S., and R. A. LeBrun
  - "Population Regulation, Natural Enemies, and Host-Seeking Patterns of Deer Ticks, *Ixodes scapularis* (Acari: Ixodidae)," prepared for the National Park Service. January 1996.
- Ginsberg, H. S., and E. Zhioua
  - "Nymphal Survival and Habitat Distribution of *Ixodesm scapularis* and *Amblyomma americanum* Ticks (Acari: Ixodidae) on Fire Island, New York, USA." *Experimental and Applied Acarology* 20:533-544.
  - "Influence of Deer Abundance on the Abundance of Questing Adult *Ixodes scapularis* (Acari: Ixodidae)." *Journal of Medical Entomology* 36(3): 376-381.
- Ginsberg, H. S., M. Butler, and E. Zhioua
  - "Effect of Deer Exclusion by Fencing on Abundance of *Amblyomma americanum* (Acari: Ixodidae) on Fire Island, New York, USA." *Journal of Vector Ecology* 27(2): 215-221.

- Gionfriddo, J. P., A. J. Denicola, L. A. Miller, and K. A. Fagerstone
  - 2011 "Efficacy of GnRH Immunocontraception of Wild White-tailed Deer in New Jersey." *Wildlife Society Bulletin* 35:142-148.
- Gionfriddo, J. P., J. D. Eisemann, K. J. Sullivan, R. S. Healey, L. A. Miller, K. A. Fagerstone, R. M. Engeman, and C. A. Yoder
  - 2009 "Field Test of a Single-injection Gonadotropin-releasing Hormone Immunocontraceptive Vaccine in Female White-tailed Deer." *Wildlife Research* 36:177-184.
- Grossman, D.H., D. Faber-Langendoen, A. S. Weakley, M. Anderson, P. Bourgeron, R. Crawford, K. Goodin, S. Landaal, K. Metzler, K.D. Patterson, M. Pyne, M. Reid, and L. Sneddon
  - 1998 International Classification of Ecological Communities: Terrestrial Vegetation of the United States. Volume I. The National Vegetation Classification System: Development, Status and Applications. The Nature Conservancy, Arlington, VA, USA.
- Harlow, R. F., and R. L. Downing
  - "Deer Browsing and Hardwood Regeneration in the Southern Appalachians." *Journal of Forestry* 68:298-300.
- Hawkins, R. E., L. Dl. Martoglio, and G. G. Montgomery
  1968 "Cannon-netting Deer." *Journal of Wildlife Management* 32(1):191-195.
- Healy, W. M.
  - "Influence of Deer on the Structure and Composition of Oak Forests in Central Massachusetts." P. 249-266, *In*: McShea, W. J., H. B. Underwood, and J. H. Rappole (eds.). *The Science of Overabundance: Deer Ecology and Population Management*. Smithsonian Institution Press, Washington, D.C.
- Heckel, C. D., N. A. Bourg, W. J. McShea, and S. Kalisz
  - 2010 "Nonconsumptive Effects of a Generalist Ungulate Herbivore Drive Decline of Unpalatable Forest Herbs." *Ecology* 91(2):319-326.
- Henderson, D. W., R. J. Warren, J. A. Cromwell, and R. J. Hamilton
  2000 "Responses of Urban Deer to a 50% Reduction in Local Herd Density." *Wildlife*Society Bulletin 28(4):902-910.
- Hobbs, N. T., D. C. Bowden, and D. L. Baker
  - 2000 "Effects of Fertility Control on Populations of Ungulates: General, Stage-Structured Models." *Journal of Wildlife Management* 64 (2):473-491.
- Holling, C. S.
  - 1978 Adaptive Environmental Assessment and Management. New York: John Wiley & Sons.
- Hone, J.
  - "Rate of Increase and Fertility Control." *Journal of Applied Ecology* 29:695-698.
- Horsley, S. B., and D. A. Marquis
  - "Interference by Deer and Weeds with Allegheny Hardwood Reproduction." *Canadian Journal of Forest Research* 13:61-9.
- Horsley, S. B., S. L. Stout, and D. S. deCalesta
  - 2003 "White-tailed Deer Impact on the Vegetation Dynamics of a Northern Hardwood Forest." *Ecological Applications* 13(1):98-118.

- Joly, D. O., M. D. Samuel, J. A. Langenberg, J. A. Blanchong, C. A. Batha, R. E. Rolley, D. P. Keane, and C. A. Ribic
  - 2006 "Spatial Epidemiology of Chronic Wasting Disease in Wisconsin White-tailed Deer." *Journal of Wildlife Diseases* 42(3):578-588.
- Jones, J. M., and J. H. Witham
  - "Post-translocation Survival and Movements of Metropolitan White-tailed Deer." *Wildlife Society Bulletin* 18(4):434-441.
- Jones, M. L., N. E. Mathews, and W. F. Porter
  - "Influence of Social Organization on Dispersal and Survival of Translocated Female White-tailed Deer." *Wildlife Society Bulletin* 25:272-278.
- Jordan, R. A., T. L. Schulze, and M. B. Jahn
  - 2007 "Effects of Reduced Deer Density on the Abundance of *Ixodes scaplaris* (Acari: Ixodidae) and Lyme Disease Incidence in a Northern New Jersey Endemic Area." *Journal of Medical Entomology* 44(5): 752-757.
- Killian, G., T. Kreeger, J. Rhyan, K. Fagerstone, and L. Miller
  - "Observations on the Use of Gonacon in Captive Female Elk (*Cervus elaphus*)." *Journal of Wildlife Disease* 45:184-188.
- Killian, G., D. Wagner, K. Fagerstone, and L. Miller
  - 2008 "Long-term Efficacy and Reproductive Behavior Associated with GonaConTM Use in White-tailed Deer (*Odocoileus virginianus*)." Proceedings of the 23rd Vertebrate Pest Conference, University of California, Davis.
- Kirkpatrick, J. F., I. K. M. Liu, J. W. Turner, R. Naugle, and R. Keiper
  - "Long term Effects of Porcine Zona Pellucidae Immunocontraception on Ovarian Function in Feral Horses (Equus caballus)." *Journal of Reproduction and Fertility* 94:437-44.
- Kilpatrick, H. J., S. M. Spohr, and A. J. DeNicola
  - "Darting Urban Deer: Techniques and Technology." *Wildlife Society Bulletin* 25 (2): 542-46.
- Klopfer, S. D., A. Olivero, L. Sneddon, and J. Lundgren
  - Final Report of the NPS Vegetation Mapping Project at Fire Island National Seashore. CMI-GRS-02-03. USGS and Conservation Management Institute, Virginia Tech.
- Knight, T. M., L. L. Dunn, L. A. Smith, J. Davis, and S. Kalisz
  - "Deer Facilitate Invasive Plant Success in a Pennsylvania Forest Understory." Natural Areas Journal 29:110-116.
- Knoch H. W., and M. D. Lowery
  - 1989 The 1988/89 Deer Hunt on Fire Island National Seashore. Prepared for the New York State Department of Environmental Conservation.
- Kreeger, T. J., and J. M. Armeno
  - 2012 *Handbook of Wildlife Chemical Immobulization*. Fourth edition, Laramie, Wyoming, 448pp.
- Landres, P., C. Barns, J.G. Dennis, T. Devine, P. Geissler, C.S. McCasland, L. Merigliano, J. Seastrand, and R. Swain
  - 2008 Keeping It Wild: An Interagency Strategy to Monitor Trends in Wilderness Character across the National Wilderness Preservation System. General Technical Report

- RMRS-GTR-212. Fort Collins, Colorado: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station.
- Latham, R. E., J. Beyea, M. Benner, C. A. Dunn, M. A. Fajvan, R. R. Freed, M. Grund, S. B. Horsley, A. F. Rhoads, and B. P. Shissler
  - 2005 Managing White-tailed Deer in Forest Habitat from an Ecosystem Perspective: Pennsylvania Case Study. Report by the Deer Management Forum for Audubon Pennsylvania and Pennsylvania Habitat Alliance, Harrisburg.
- Leong, K. M., and D. J. Decker
  - 2007 Identifying Capacity for Local Community Participation in Wildlife Management Planning Case 1: White-tailed Deer Issues at Fire Island National Seashore. HDRU Series No. 07-1. Human Dimensions Research Unit, Department of Natural Resources. Cornell University, Ithaca, New York.
- Long, Z. T., T. H. Pendergast, IV, and W. P. Carson

  2007 "The Impact of Deer on Relationships between Tree Growth and Mortality in an
  Old-growth Beech-maple Forest." Forest Ecology and Management 252:230-238.
- Lovallo, M. J., and W. M. Tzilkowski
  - Abundance of White-tailed Deer (Odocoileus Virginianus) within Valley Forge National Historical Park and Movements Related to Surrounding Private Lands. U.S. Department of the Interior, National Park Service, Technical Report NPS/NERCHAL/NRTR-03/091.
- MacLean, R. A., N. E. Mathews, D. M. Grove, E. S. Frank, and J. Paul-Murphy
  2006 "Surgical Technique for Tubal Ligation in White-tailed Deer (*Odocoileus virginianus*)." *Journal of Zoo and Wildlife Medicine* 37:354-360.
- Marchington, R. L., and D. H. Hirth
  - "Behavior." Pgs 129-168, *In* L. K. Halls, ed., *Ecology and Management of White Tailed Deer*. Stackpole Books, Harrisburg, PA.
- Marquis, D. A.
  - 1981 Effect of Deer Browsing on Timber Production in Allegheny Hardwood Forests of Northwestern Pennsylvania. NE-475, USDA Forest Service, Broomall, Pennsylvania. 32pp.
- Marquis, D. A., R. L. Ernst, and S. L. Stout
  - 1992 Prescribing Silvicultural Treatments in Hardwood Stands in the Alleghenies. Revised. General Technical Report NE-96. Northeastern Forest Experiment Station, U.S. Forest Service.
- Maryland Department of Natural Resources (Maryland DNR)
  - 2002 Deer Management Options. http://www.dnr.state.md.us/wildlife/options.html (accessed March 2012).
- Mathews, N. E., J. Paul-Murphy, E. S. Frank
  - Evaluation of a Trap-sterilize-release Program for White-tailed Deer Management in Highland Park, Illinois, 2002-2005. Report for the Highland Park City Council, Illinois.
- McCormick and Associates, Inc.
  - 1975 Environmental Inventory of Fire Island National Seashore and the William Floyd Estate, Suffolk County, New York. Report prepared for the National Park Service.

- McCullough, D. E.
  - 1979 The George Reserve Deer Herd: Population Ecology of a K-Selected Species. Ann Arbor: University of Michigan Press.
- McDonald, J. E. Jr., and C.S. Hollingsworth
  - 2007 Preventing Deer Damage. University of Massachusetts. http://extension.umass.edu/vegetable/articles/preventing-deer-damage (accessed January 4, 2013).
- McElroy, A., M. Benotti, G. Edinger, A. Feldmann, C. O'Connell, G. Stewart, R. L. Swanson, and J. Waldman
  - 2009 Assessment of Natural Resource Conditions: Fire Island National Seashore. Natural Resource Report NPS/NRPC/NRR 2009/139. National Park Service, Fort Collins, Colorado.
- McShea, W. J., and J. H. Rappole
  - "Herbivores and the Ecology of Forest Understory Birds." Pp. 298-309 in W. J. McShea, H. B. Underwood and J. H. Rappole (eds.), *The Science of Overabundance, Deer Ecology and Population Management*. Washington, D.C.: Smithsonian Institution Press.
- McShea, W. J., S. L. Monfort, S Hakim, J. Kirkpatrick, I Liu, J. W. Turner, Jr., L. Chassy, L. Munson

  1997 The effect of immunocontraception on the behavior and reproduction of white-tailed

  deer. Journal of Wildlife Management 61(2): 560-569.
- McShea, W. J., and J. H. Rappole
  - 2000 "Managing the Abundance and Diversity of Breeding Bird Populations through Manipulations of Deer Populations." *Conservation Biology* 14(4):1161-1170.
- McWilliams, W. H., C. A. Alerich, D. A. Devlin, A. J. Lister, T. W. Lister, S. L. Sterner, and J. A. Westfall
  - Annual Inventory Report for Pennsylvania's Forests: Results from the First Three Years. U. S. Department of Agriculture Forest Service, Northeastern Research Station, Resource Bulletin NE-159. 95pp.
- McWilliams, W.H.; T.W. Bowersox, P.H. Brose, D.A. Devlin, J.C. Finley, K.W. Gottschalk, S. Horsley, S.L. King, B.M. LaPoint, T.W. Lister, L.H. McCormick and others.
  - "Measuring tree seedlings and associated understory vegetation in Pennsylvania's forests." Pages 21-26 in R.E. McRoberts, G.A. Reams, P.C. Van Deusen, W.H. McWilliams, and C.J. Cieszewski, editors. *Proceedings of the Fourth Annual Forest Inventory and Analysis Symposium*; General Technical Report NC-252. U.S. Department of Agriculture, Forest Service, North Central Research Station, St. Paul, Minnesota.
- Mech, D. L.
  - 1990 The Way of the Wolf. Stillwater, MN: Voyageur Press, Inc.
- Miller, B. F., T. A. Campbell, B. R. Laseter, W. M. Ford, and K. V. Miller
  - 2009 "White-tailed Deer Herbivory and Timber Harvesting Rates: Implications for Regeneration Success. *Forest Ecology and Management* 258:1067-1072.
- Miller, K. V.
  - "Considering Social Behavior in the Management of Overabundant White-tailed Deer Populations." *Wildlife Society Bulletin* 25(2):279-281.

- Miller, L. A., K. Crane, S. Gaddis, and G. J. Killian
  - "Immunocontraception of White-tailed Deer with GnRH Vaccine." *American Journal of Reproductive Immunology* 44:266-74.
  - 2001 "Porcine Zona Pellucida Immunocontraception: Long-term Health Effects on White-tailed Deer." *Journal of Wildlife Management* 65 (4): 941-5.
- Miller, L. A, J. P. Gionfriddo, K. A. Fagerstone, J. C. Rhyan, and G. J. Killian

  2008 "The Single-shot GnRH Immunocontraceptive Vaccine (GonaCon<sup>TM</sup>) in Whitetailed Deer: Comparison of Several GnRH Preparations." *American Journal of*Reproductive Immunology 60:214-223.
- Mitra, S., and J. Putnam
  - 1999 *Birds of Fire Island National Seashore*. National Park Service, Fire Island National Seashore, Patchogue, NY.
- Mixson, T. R., H. S. Ginsberg, S. R. Campbell, J. W. Sumner, and C. D. Paddock

  2004 "Detection of Ehrlichia chaffeensis in Adult and Nymphal

  Amblyommaamericanum (Acari: Ixodidae) Ticks from Long Island, New York."

  Journal of Medical Entomology. 41(6): 1104-1110.
- Mixson, T. R, S. R. Campbell, J. S. Gill, H. S. Ginsberg, M. V. Meichard, T. L. Schulze, and G. A. Dasch
  - 2006 "Prevalence of *Ehrlichia, Borrelia*, and *Rickettsial* Agents in *Amblyomma* americanum (Acari: Ixodidae) Collected from Nine States." *Journal of Medical Entomology*. 43(6): 1261-1268.
- Mosbacher, E. V., and C. E. Williams
  - 2009 "Browse Preference and Browsing Intensity of White-tailed Deer (*Odocoileus virginianus*) in Allegheny High Plateau Riparian Forests, USA." *Wildlife Biology in Practice* 5(1):11-21.
- Murray, C., and D. Marmorek
  - Adaptive Management: A Spoonful of Rigour Helps the Uncertainty Go Down.

    Presented at the 16th International Annual Meeting of the Society for Ecological Restoration, Victoria, British Columbia, Canada August 23rd to 27th, 2004, 6 pp. http://www.essa.com/downloads/Murray\_Marmorek\_adaptive\_management\_SER\_conference.pdf (accessed March 2012).
- National Oceanic and Atmospheric Administration (NOAA)
  - 2008 Marine Protected Areas in New Jersey and New York. Available at http://www.mpa.gov/helpful\_resources/inventoryfiles/njny\_mpas\_wallmap.pdf (accessed August 9, 2012).
  - 2009 "Notice: List of National System Marine Protected Areas." *Federal Register* 74(77):18551. April 23.
  - 2012 *List of National System Marine Protected Areas.* Dated February 23, 2012. http://www.mpa.gov/nationalsystem/nationalsystemlist/ (accessed August 9, 2012).
- National Park Service (NPS)
  - 1977 General Management Plan for Fire Island National Seashore.
  - 1983 Wilderness Management Plan, Fire Island National Seashore. November 1983.
  - 2001 Director's Order 12 Handbook: Conservation Planning, Environmental Impact Analysis, and Decision-making. NPS Office of Policy.

2002a Director's Order 28: Cultural Resource Management Guideline. NPS Office of Policy. Director's Order 77-1: Wetland Protection. NPS Office of Policy. 2002b 2003 Director's Order 77-2: Floodplain Management. NPS Office of Policy. 2006a NPS Management Policies 2006. 2006b National Park Service Cultural Landscapes Inventory: William Floyd Estate, Fire Island National Seashore. 2007 Fire Island National Seashore Business Plan. 2008 Final White-tailed Deer Management Plan/Environmental Impact Statement for Catoctin Mountain Park. 2009a Fire Island National Seashore Resident Study, Spring 2008. University of Idaho, Park Studies Unit, Visitor Service Project Report 202. 2009b Fire Island National Seashore Visitor Study, Summer 2008. University of Idaho, Park Studies Unit, Visitor Service Project Report 203. 2009c Final White-tailed Deer Management Plan/Environmental Impact Statement for Valley Forge National Historical Park. 2009d Get the Lead Out! An Initiative to Address Lead Reduction in National Park Service *Natural Resource Activities.* Memo from the acting director of the National Park Service to the regional directors; associate director, visitor and resource protection; and assistant director, business services. March 4, 2009. 2011a Deer density survey data (unpublished). Fire Island National Seashore, National Park Service. 2011b Desired Future Conditions for the Sunken Forest and Other Natural Zones, as Part of Fire Island National Seashore's Deer and Vegetation Management Plan/EIS. (unpublished). Prepared by L. Ries and J. Raphael. 2011c Director's Order 12: Conservation Planning, Environmental Impact Analysis, and Decision Making. NPS Office of Policy. 2012a National Park Service Procedural Manual #77-1: Wetland Protection. Available at: http://www.nature.nps.gov/water/wetlands/Wetlands Protection Manuals.cfm. Revised January 2012. 2012b Fire Island National Seashore website. Available at http://www.nps.gov/fiis. 2012c Park Statistics. Available at: www.nps.gov/fiis/parkmgmt/statistics.htm. Accessed June 6, 2013. 2012d Fire Island National Seashore Annual Visitation Reports. 1967-2011. Available at: http://www.nature.nps.gov/stats (accessed September 2012). 2012e Threatened and Endangered Species Monitoring Program 2012 Summary. National Park Service, Fire Island National Seashore. Prepared by L. Ries, J. Popham, and M. Sorlien. 2013a 4-Poster Devise Use within the Boundaries of Fire Island National Seashore, FY12 (unpublished report). National Park Service, Fire Island National Seashore.

Prepared by L. Ries and K. Kerr.

- 2013b Keeping It Wild in the National Parks: A user guide to integrating wilderness character into park planning, management, and monitoring. Wilderness Stewardship Division, Wilderness Stewardship Program. National Park Service.2013c Fire Island National Seashore Draft General Management Plan and Environmental Impact Statement. Internal WASO Policy Review Draft.
- 2013d Unpublished Deer Density Data. Excel spreadsheet provided by Park Wildlife Biologist.
- 2013e Vegetation Monitoring, Forest Regeneration, Browsing Pressures, and Hurricane Sandy Impacts in Blue Point and Talisman; 2012 2013 Summary (draft currently in review). National Park Service, Fire Island National Seashore. Prepared by J. Raphael.
- Vegetation Monitoring, Forest Regeneration, and Browsing Impacts at the William Floyd Estate: 2013 Summary (draft currently in review). National Park Service, Fire Island National Seashore. Prepared by J. Raphael.
- *Insects*, *Spiders*, *Centipedes*, *Millipedes*. Fire Island National Seashore. Available at http://www.nps.gov/fiis/naturescience/insects.htm (accessed February 2014).
- Natural Resources Conservation Service (NRCS), U. S. Department of Agriculture

  2013 Web Soil Survey website. http://websoilsurvey.nrcs.usda.gov/ (accessed December 2013).
- Naugle, R.E., A. T. Rutberg, H. B. Underwood, J. W. Turner, Jr., and I. K. M. Liu

  2002 "Field Testing of Immunocontraception on White-Tailed (*Odocoileus virginianus*)
  on Fire Island National Seashore, New York, USA," *Reproduction Supplement*60:143-153.

# Nelessen, A and Associates

2012 *Character Study Fire Island, New York.* Prepared for the U.S. Department of Interior, National Park Service. 61pp.

# New York State Department of Environmental Conservation (NYS-DEC)

- 2011 Management Plan for White-tailed Deer in New York State 2012-2016. Division of Fish, Wildlife and Marine Resources, Bureau of Wildlife. Available at: http://www.dec.ny.gov/docs/wildlife\_pdf/deerplan2012.pdf. Accessed July 2012.
- 2013a New York State White-tailed Deer Harvest Summary 2013. Division of Fish, Wildlife, and Marine Resources.
- 2013b Winter Deer Food. www.dec.ny.gov/animals/7195.htm (accessed November 13, 2013).
- 2014 Eastern Mud Turtle Fact Sheet, http://www.dec.ny.gov/animals/7152.html (accessed June 27, 2014).
  - New York State Department of Environmental Conservation and Cornell Cooperative Extension New York State College of Agriculture and Life Sciences (NYS-DEC and CCE)
- The Status and Impact of Eastern Coyotes in Northern New York. NYS-DEC Bureau of Wildlife, Division of Fish and Wildlife. 51 pp.

#### Niedowski, N. L.

2000 New York State Salt Marsh Restoration and Monitoring Guidelines. New York State Department of State, Division of Coastal Resources, Albany, NY.

- O'Bryan, M. K., and D. R. McCullough
  - "Survival of Black-tailed Deer following Relocation in California." *Journal of Wildlife Management* 49(1):115-119.
- O'Connell, A. F.
  - 1989 Population Dynamics, Habitat Relationships, Physiological Parameters, Lyme Disease, and Management of a Barrier Island White-Tailed Deer Population. (PhD diss., University of Massachusetts, 1989).
- O'Connell, A. F., and M. W. Sayre
  - White-tailed Deer Management Study: Fire Island National Seashore. Final report to the National Park Service, CA-1600-4-0005.
  - 1989 Physical characteristics of Fire Island's deer population and an evaluation of sport hunting within Fire Island National Seashore. CA-1600-4-0005.
- Opler, P. A., K. Lotts, and T. Naberhaus, coordinators
  - 2013 Butterflies and Moths of North America. http://www.butterfliesandmoths.org/ (Version 02-21-2014).
- Oyer, A. M., and W. F. Porter
  - 2004 "Localized Management of White-tailed Deer in the Central Adirondack Mountains, New York." *Journal of Wildlife Management* 68(2): 257-265.
- Parker, I. D., D. E. Watts, R. R. Lopez, N. J. Silvy, D. S. Davis, R. A. McCleery, and P. A. Frank 2007 "Evaluation of the Efficacy of Florida Key Deer Translocations." *Journal of Wildlife Management* 72(5):1069-1075.
- Pedersen, B. S., and A. M. Wallis
  - 2004 "Effects of White-tailed Deer Herbivory on Forest Gap Dynamics in a Wildlife Preserve, Pennsylvania, USA." *Natural Areas Journal* 24(2):82-94
- Pendleton, E. A., S. J. Williams, and E. R. Thieler
  - 2004 Coastal Vulnerability and Assessment of Fire Island National Seashore to Sea-level Rise. U.S. Geological Survey Open-file Report 03-439.
- Pennsylvania Game Commission (PGC)
  - 2013 Capture Myopathy. Online publication at http://www.portal.state.pa.us/portal/server.pt/document/1204940/capture\_myopat hy\_ pdf (accessed on December 19, 2013).
- Perkins, S.E., I. M. Cattadori, V. Tagliapietra, A. P. Rizzoli, and P. J. Hudson 2006 "Localized Deer Absence leads to Tick Amplification." *Ecology* 87:1981-1986.
- Peterson, M. N., R. R. Lopez, P. A. Frank, M. J. Peterson, and N. J. Silvey

  2003 "Evaluating Capture Methods for Urban White-tailed Deer." Wildlife Society

  Bulletin 31:1176-1187.
- Porter, W. F., N. E. Mathews, and H. B. Underwood
  - "Social Organization in Deer: Implications for Localized Management." *Environmental Management* 15(6):809-814.
- Porter, W. F., H. B. Underwood, and J. L. Woodward
  - "Movement Behavior, Dispersal, and the Potential for Localized Management of Deer in Suburban Environments." *Journal of Wildlife Management* 68 (2): 2223-34.

- Rand, P. W., C. Lubelczyk, G. R. Lavigne, S. Elias, M. S. Holman, E. H. Lacombe, and R. P. Smith "Deer Density and the Abundance of *Ixodes scapularis* (Acari: Ixodidae)." *Journal of Medical Entomology* 40(2): 179-184.
- Rawinski, T. J.
  - 2008 Impacts of White-tailed Deer Overabundance in Forest Ecosystems: An Overview. USDA Forest Service, Newtown Square, PA.
- Rosenzweig, C., W. Solecki, A. GeGaetano, M. O'Grady, S. Hassol, P. Grabhorn (Eds.)

  2011 Responding to climate change in New York State: The ClimAID integrated assessment for effective climate change adaptation. Synthesis Report. New York State Energy Research and Development Authority, Albany, New York.
- **RSMeans** 
  - 2013 RSMeans Building Construction Cost Data 2014. 72nd Ed.
- Rudolph, B. A., W. F. Porter, and H. B. Underwood

  2000 "Evaluating Immunocontraception for Managing Suburban White-tailed Deer in Irondequoit, New York." *Journal of Wildlife Management* 64(2):463-473.
- Russell, R. L., D. B. Zippin, and N. L. Fowler

  2001 "Effects of White-tailed deer (*Odocoileus virginianus*) on Plants, Plant Populations and Communities: A Review." *American Midland Naturalist* 146(1):1-26.
- Rutberg, A. T.

  2009 Email communication to Kristina Heister, Natural Resource Manager, Valley Forge
  National Historical Park regarding updated results of research being conducted on
  one-shot, multi-year PZP vaccine on Fripp Island, SC. March 25, 2009.
- Rutberg A. T. and R. E. Naugle

  2008 "Population-level Effects of Immunocontraception in White-tailed Deer

  (Odocoileus virginianus)." Wildlife Research 35: 494-501.
- Rutberg, A. T., R. E. Naugle, L. A. Thiele, and I. K. M. Liu

  2004 "Effects of Immunocontraception on a Suburban Population of White-tailed Deer

  Odocoileus virginianus." Biological Conservation 116:243-50.
- Rutberg, A. T., R. E. Naugle, J. W. Turner Jr., M. A. Fraker, and D. R. Flanagan

  "Field Testing of Single-administration Procine Zona Pellucida Contraceptive
  Vaccines in White-tailed Deer (*Odocoileus virginianus*). Wildlife Research 40:281288.
- Sage, R. W., Jr., W. F. Porter, and H. B. Underwood

  2003 "Windows of Opportunity: White-tailed Deer and the Dynamics of Northern
  Hardwood Forests of the Northeastern U.S." *Journal for Nature Conservation*10:213-20.
- Salmon, P. A., and H. B. Underwood

  2007 Exploring the Feasibility of White-tailed Deer Fertility Control Programs. National Park Service Technical Report NPS/NER/NRTR-2007/087. 103pp.
- Samuel, M. D., D. O. Joly, M. A. Wild, S. D. Wright, L. L. Otic, R. W. Werge, and M. W. Miller

  2003 Surveillance Strategies for Detecting Chronic Wasting Disease in Free-ranging Deer

  and Elk. National Wildlife Heath Center, United States Geological Survey,

  Madison, Wisconsin.

- Schulte, E.
  - 1965 A Study of the Ecology of the Plants in the Sunken Forest, Fire Island, New York. Masters Thesis. C. W. Post College of Long Island University. 69pp.
- Schwartz, J. A., R. J. Warren, D. W. Henderson, D. A. Osborn, and D. J. Kesler

  "Captive and Field Tests of a Method for Immobilization and Euthanasia of Urban

  Deer." *Wildlife Society Bulletin* 25 (2): 532-41.
- Sexton, W. T., A. Malk, R. C. Szaro, and N. Johnson
  - "Values, Social Dimensions, Economic Dimensions, Information Tools" In *Ecological Stewardship: A Common Reference for Ecosystem Management*, Volume 3. Oxford, UK: Elsevier Science.
- Siemer, W. F., K. M. Leong, D. J. Decker, and K. K. Smith
  - 2007 Deer, People, and Parks: Perspectives of Residents in Communities near Fire Island National Seashore. Department of Natural Resources, Cornell University, Ithaca, NY. HDRU Series Publication 07-8.
- Sirkin, L. A.
  - "Origin and History of Maple Bog in the Sunken Forest, Fire Island, New York," *Bulletin of the Torrey Botanical Club* 99(3): 131-135.
- Southgate, E. W. B. (Russell)
  - 2002 Changes in the Forests of the Jockey Hollow Unit of Morristown National Historic Park over the Last 5 15 Years. U.S. Department of Interior, National Park Service Technical Report NPS/BSO-RNR/NRTR/2002-9. 30pp.
- Stafford, K. C.
  - 2007 Tick Management Handbook: An Integrated Guide for Homeowners, Pest Control Operators, and Public Health Officials for the Prevention of Tick-associated Disease. Revised Edition. The Connecticut Agricultural Experiment Station. The Connecticut General Assembly.
- Stone, W. B., J. C. Okoniewski, and J. R. Stedelin
  - "Poisoning of Wildlife with Anticoagulant Rodenticides in New York." *Journal of Wildlife Diseases* 35(2): 187-193.
- Stout, S. L.
  - "A Conflict between Forest Renewal and White-tailed Deer: A Silviculturist's Perspective on Values." In *Proceedings, Conference on the Impact of Deer on the Biodiversity and Economy of the State of Pennsylvania*. September 24-25, 1999. Harrisburg, PA: The Audubon Society. Pp. 27-39.
- Tilghman, N. G.
  - "Impacts of White-tailed deer on Forest Regeneration in Northwestern Pennsylvania." *Journal of Wildlife Management* 53(3): 524-532.
- Tymkiw, E.L., J.L Bowman, and W. G. Shriver
  - "The Effect of White-Tailed Deer Density on Breeding Songbirds in Delaware." Wildlife Society Bulletin 37(4): 714-724.
- Trocki, C. L.
  - Northeast Coastal and Barrier Network FIIS Biotic Resource Synthesis Report. Fire Island National Seashore.

- Trumbull, V. L., E. J. Zielinski, and E. C. Aharrah
  - "The Impact of Deer Browsing on the Allegheny Forest Type." *Northern Journal of Applied Forestry* 6:162-165.
- Turner, J. W., Jr., J. F. Kirkpatrick, and I. K. M. Liu
  - "Effectiveness, Reversibility and Serum Antibody Titers Associated with Immunocontraception in Captive White-tailed Deer." *Journal of Wildlife Management* 60:45-51.
- Turner, J. W., A. T. Rutberg, R. E. Naugle, M. A. Kaur, D. R. Flanagan, H. J. Bertschinger, and I. K. M. Liu
  - 2008 "Controlled-release Components of PZP Contraceptive Vaccine Extend Duration of Infertility." *Wildlife Research* 35: 555-562.
- Underwood, H. B.
  - 1991 Trends in Relative Abundance and Growth Rates of White-tailed Deer on Fire Island National Seashore. Unpublished Report to Fire Island National Seashore. 18pp. +1 table, 3 figures, 1 appendix.
  - White-tailed Deer Ecology and Management on Fire Island National Seashore (Fire Island National Seashore Synthesis Paper). Technical Report NPS/NER/NRTR-2005-022, Boston, MA.
- Underwood, H. B., F. D. Verret, and J. P. Fischer
  - 1998 Density and Herd Composition of White-tailed Deer Populations of Fire Island National Seashore. Report to National Park Service.
- Underwood, H. B.
  - 2011 Personal communication on the condition of the deer herd at Fire Island National Seashore. Fire Island National Seashore Science Advisory Team.
- Underwood, H. B., L. Ries, and J. Raphael
  - Supporting data analysis and interpretation for the Fire Island National Seashore Science Advisory Team. (Unpublished).
- U.S. Army Corps of Engineers
  - 2005 Atlantic Coast of Long Island, Fire Island Inlet to Montauk Point, New York: Reformulation Study, Beach and Interdunal Invertebrate Survey. 114 pp.
- U.S. Department of Agriculture, Animal and Plant Health Inspection Service
  - 2009 Environmental Assessment: An Integrated Wildlife Damage Management Approach for the Management of White-tailed Deer Damage in the State of New York. Finding and Decision of No Significant Impact. 14pp.
- U.S. Department of Agriculture (USDA), Forest Service
- 2013 *Pennsylvania's Forests*, 2009. Resource Bulletin NRS-82. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station. 52pp.
- VerCauteren, K., J. Beringer, and S. E. Hygnstrom
  - 1999 *Use of Netted Cage Traps for Capturing White-Tailed Deer.* USDA National Wildlife Research Center Staff Publications. Paper 833.
- VerCauteren, K. C., T. R. Vandeelen, M. J. Lavelle, and W. H. Hall
  - 2010 "Assessment of Abilities of White-tailed Deer to Jump Fences." *Journal of Wildlife Management* 74(6):1378-1381.

# Verme, L. J.

"Reproductive Patterns of White-tailed Deer related to Nutritional Plane." *Journal of Wildlife Management* 33(4):881-887.

# Wakeland, B. and R. K. Swihart

2009 Ratings of White-tailed Deer Preferences for Woody Browse in Indiana. Proceedings Indiana Academy of Science.

#### Walter, W. D., H. J. Kilpatrick, and M. A. Gregonis

"Does immunocontraception improve condition of free-ranging female white-tailed deer?" *Journal of Wildlife Management* 67:762-766.

# Warren, R. J.

1997 Ecological Justification for Controlling Deer Populations in Eastern National Parks.
Transactions of the 56th North American Wildlife and Natural Resources
Conference.

2000 "Overview of Fertility Control in Urban Deer Management." In *Proceedings of the* 2000 Annual Conference for the Society of Theriogenology, 2 December 2000, San Antonio, Texas, 237–46. Nashville, TN: Society for Theriogenology.

#### West Virginia University (WVU)

Deer and Agriculture in West Virginia. Publication 820. Center for Extension and Continuing Education, Cooperative Extension Service. http://www.wvu.edu/%7Eexten/infores/pubs/ pest/deer820.pdf (accessed on August 10, 2009).

# Whitaker, J. O., and W. J. Hamilton

Mammals of the Eastern United States, 3rd Ed. Cornell University Press. Ithaca, NY. 583pp.

### White Buffalo, Inc.

2005 Review of Available Techniques. <a href="http://www.whitebuffaloinc.org/techniques.html">http://www.whitebuffaloinc.org/techniques.html</a> (accessed on August 10, 2009).

# White, M.

2012 Long-term Effects of Deer Browsing: Composition, Structure, and Productivity in a Northeastern Minnesota Old-growth Forest. Forest Ecology and Management 269:222-228.

#### Wilderness.net

"Otis Pike Fire Island High Dune Wilderness." http://www.wilderness.net/index.cfm?fuse=NWPS&sec=wildView&WID=182 (accessed August 2012).

# Williams, B. K.

2008 Personal communication between Ken Williams, U.S. Geological Survey and Michael Mayer, Senior Regulatory Specialist, The Louis Berger Group, Inc., September 16, 2008, regarding adaptive management flow chart.

# Williams, B. K., R. C. Szara, and C. D. Shapiro

2007 Adaptive Management: The U.S. Department of the Interior Technical Guide. http://www.doi.gov/initiatives/AdaptiveManagement/documents.html (accessed on August 10, 2009).

# Williams, S. C., A. J. DeNicola, and I. M. Ortega

"Behavior Responses of White-tailed Deer Subjected to Lethal Management." Canadian Journal of Zoology 86:1358-1366.

# Williams, S. C, J. S. Ward, and R Ramakrishnan

2008 "Endozoochory by White-tailed Deer (*Odocoileus virginianus*) across a Suburban/woodland Interface." *Forest Ecology and Management* 255:940-947.

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As the nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering sound use of our land and water resources; protecting our fish, wildlife, and biological diversity; preserving the environmental and cultural values of our national parks and historic places; and providing for the enjoyment of life through outdoor recreation. The department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people by encouraging stewardship and citizen participation in their care. The department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.

NPS/FIIS/615/125/465 JULY 2014



