

White-tailed Deer:

Sterilization  
Lyme Disease  
Forest Health



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### Surgical Sterilization: Across the country, it works

Surgical sterilization, otherwise known as spaying or neutering, has significantly reduced local deer populations in Virginia, California, Michigan, New York, Ohio, and Maryland. Moreover, it is effective in certain open populations.

Wildlife biologist Anthony DeNicola, Ph.D., is the leading contractor for reproductive and lethal deer programs in the United States. His organization performs wildlife control procedures in the United States, Japan, Botswana, and Mongolia. The [New York Times](#) and the [Washington Post](#) have chronicled his successful sterilization projects in New York and Maryland.

During a webinar hosted by the Botstiber Institute for Fertility Control in 2020, Anthony DeNicola was unequivocal:

# WEBINAR

## DEER POPULATION DEMOGRAPHIC IMPACTS OF INTENSIVE SURGICAL STERILIZATION TREATMENTS

*This webinar, which was originally presented on Tuesday, November 17, 2020, features Dr. Anthony DeNicola, President of White Buffalo, Inc., presenting data on his six surgical sterilization sites with open populations (not fenced or island environments) in California, Maryland, Michigan, Ohio, Virginia, and New York. From 2012 to 2020, Dr. DeNicola and his team sterilized 493 deer via tubal ligation and ovariectomy. They noted an average reduction in deer abundance of 25% from Year 1 to Year 2. At research sites with 4 years of sterilization treatment (4 sites), they noted an average total reduction of 45%. His results demonstrate that significant reductions in local deer densities using high percentage surgical sterilization programs can be achieved. In this webinar Dr. DeNicola also provides details on long-term program maintenance strategies using local volunteers.*

-End of Excerpt-

To view the webinar and learn more about surgical sterilization from its foremost practitioner, click [here](#).

For independent accounts, see:

- National Institutes of Health, Bethesda, Maryland: <https://news2use.ors.nih.gov/Pages/Why-Do-NIH-Deer-Wear-Ear-Tag.aspx>:  
“Dr. Tom Thomas, who oversees the program, said ‘that this is an alternative to relocating the deer, euthanizing the deer or to providing birth control to the deer, and it is working well to keep our deer population in check.’” The NIH campus contains a high concentration of commercial development interspersed with small natural and landscaped areas.
- San Jose: <http://www.sjdeer.com/>, The San Jose program was so successful in limiting deer that residents sought to reverse the decline and encourage migration into their community, and
- Clifton, Ohio: <https://cliftondeer.org/year-4-field-operations-report-2018-2019/>.
- National Sierra Club: <https://www.sierraclub.org/sierra/sterilization-answer-too-many-urban-deer>

Deer in New Jersey are not biologically overpopulated. In most instances, a focus on managing conflict, not deer, can go a long way toward mitigating problems; conflict resolution [guides](#) are available to assist local authorities. If, far less frequently than presumed, reduction is necessary, fertility control to humanely reduce the herd should be explored through sources unaffiliated with the shooting sports industry.

Commercial and residential development results in displacement, not overpopulation. While fertility control may not be suitable for every site, it is demonstrably viable and safe in appropriate settings which can include open populations. It is effective because the key to fewer deer, other than mass killing, is lower fertility. Hunting does not reduce fertility in individuals; it either stabilizes higher breeding rates, or, as recorded in New Jersey, increases fertility by improving habitat. Lethal removal will always require more killing. Controlled hunts spanning decades in New Jersey, with little or no change in forest regeneration or collisions, self-evidently sustain annual hunting.

### “Downward Trend in Collisions”

Over time, surgical sterilization reduces deer-car collisions. After three years, deer-related vehicle collisions (DVCs) and carcasses collected “decreased dramatically” in New York.<sup>1</sup> New York’s Deer Implementation Task Force “focused on accurately recording crashes involving deer. Between Project Year 3 and Project Year 4, the number of deer-related vehicle collisions (DVCs) and carcasses collected decreased dramatically”<sup>2</sup> by “43 percent.”

The NYPD [New York Police Department] collected deer collision information prior to the plan’s implementation. “However, in 2016 NYPD also added a deer-specific category to collision reporting.”<sup>3</sup> Likewise, “DSNY [City of New York Department of Sanitation] reports the number

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<sup>1</sup> City of New York Department of Parks and Recreation. 2021. “Managing Deer Impacts on Staten Island.” <https://storymaps.arcgis.com/stories/bffd49bd10b24b379a6c4d701c586230> .

<sup>2</sup> City of New York Department of Parks and Recreation. 2021. “Managing Deer Impacts on Staten Island.” <https://storymaps.arcgis.com/stories/bffd49bd10b24b379a6c4d701c586230> .

<sup>3</sup> Ibid.

and location of deer carcasses they've collected each year. In October 2018, DSNY worked with a vendor to begin collecting carcasses on private property."<sup>4</sup>

The New Jersey Division of Fish and Wildlife's community hunt manager, shooting advocates, and industry groups misrepresent the collision and collection rates by failing to account for the aforementioned changes in and expansion of data collection.

## Lyme Disease

See: [Forest ecology shapes Lyme disease risk in the eastern US](#), Cary Institute Tick Project<sup>a</sup>:

### Predators, acorns, & fragmentation regulate numbers of infected ticks

*(Millbrook, NY) In the eastern US, risk of contracting Lyme disease is higher in fragmented forests with high rodent densities and low numbers of resident fox, opossum, and raccoons. These are among the findings from an analysis of 19 years of data on the ecology of tick-borne disease in a forested landscape, recently published in the journal Ecology. (Monday, July 9, 2018).*

### Leading Authorities

- Disease ecologists have long absolved deer of any significant role in the transmission of Lyme disease. The [Cary Institute's Tick Project](#) (partners include the Centers for Disease Control) says that deer have gotten "[a false rap.](#)" [Harvard's School of Public Health](#) warns that "killing deer is not the answer."
- The Yale School of Public Health reports that the rate of human infection was not significantly different before and after deer hunts. After deer kills, said Harvard, Lyme infections "went up." For direct links to the aforementioned sources and mainstream press coverage, please see the Animal Protection League's [white paper](#) on Lyme disease.
- White-footed mice and abundant acorn crops, not deer, are the cause of recent spikes in infection. The humble opossum, says the Tick Project, is an "[unsung hero](#)" in the battle against Lyme disease, hoovering up to 5,000 ticks per week.
- In [international studies](#), the presence of foxes and other small predators reduces mouse density to break the cycle of infection. Foxes, say researchers, may be the disease's "worst enemy." Hunting and forest fragmentation contribute to the dwindling of small mammal predators, say researchers.
- According to [Kugeler](#),<sup>1</sup> National Center for Emerging and Zoonotic Infectious Diseases, Division of Vector-Borne Diseases, Centers for Disease Control and Prevention, deer may dilute infection rates:

*Removal of a large proportion of the deer in any given area may have unanticipated effects on the broader Lyme disease enzootic cycle in both the short and longer term. For example, while deer are a preferred host for adult ticks, in circumstances where deer are plentiful, a portion of larval or nymphal ticks feeding on uninfected deer rather than on infected reservoir hosts could*

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<sup>4</sup> Ibid.

*serve to limit or 'dilute' the local infection prevalence in ticks (Lacombe, et al., 1993;<sup>b</sup> Perkins, et al., 2006<sup>c</sup>). Broad population reduction could, at least temporarily, increase human risk of disease by increasing the number of questing adults seeking alternate hosts and by increasing infection prevalence among nymphs (Deblinger, et al., 1993;<sup>d</sup> Mount, et al., 1997;<sup>e</sup> Ginsberg and Zhioua, 1999;<sup>f</sup> Rand, et al., 2004<sup>g</sup>). Incomplete understanding of these effects limits the ability to generalize findings from published studies that seek to link specific deer densities, tick abundance and Lyme disease risk.*

The state's antiquated policy promotes fur trapping of beneficial foxes, opossums, and raccoons. The skin of the unsung hero, the opossum, fetches all of "\$2." In New Jersey, "stakeholder" groups fragment forests for commercial logging and upland hunted species.

### Summarizing Articles:

*Pittsburgh Post-Gazette:* <https://www.post-gazette.com/news/health/2017/03/28/Lyme-disease-surge-in-Pittsburgh-Western-Pennsylvania-more-acorns-more-mice-carriers/stories/201703210143> (This piece is a particularly well written overview.)

*Washington Post:* <https://www.washingtonpost.com/news/to-your-health/wp/2017/07/17/why-this-adorable-mouse-is-to-blame-for-the-spread-of-lyme-disease/>

*Cary Institute:* <https://www.caryinstitute.org/news-insights/feature/plentiful-acorns-are-sign-rising-lyme-disease-risk>

*New York Times:* <https://www.nytimes.com/2017/08/02/science/ticks-lyme-disease-foxes-martens.html>

### Correcting the State

At presentations before municipal bodies, a New Jersey Division of Fish and Wildlife community hunt manager cites "a study" to gainsay the aforementioned leading public health authorities and disease ecologists to claim a correlation between killing deer and a reduced reporting of Lyme cases in studies.

In 2011 and 2015, public health scientists ([Kugeler, et al, 2015<sup>5</sup>](#)) criticized the cited study (Kilpatrick and Labonte, 2003; Kilpatrick, et al 2014)<sup>6</sup> for "self-reporting bias" and for reporting an impact on human cases of Lyme "a full year before any should have been discernable." When a second study (Garnett et al, 2011) accounted for the 2-year lag and relied on cases reported to

<sup>5</sup> <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4912954/>

<sup>6</sup> Study authors are veteran associates of the (formerly named) Human Dimensions Research Unit, a shooting industry-wildlife agency think tank based at Cornell and chiefly focused on the general advancement of hunting and trapping, hunter satisfaction, and access to public and private land. The unit conducts surveys and produces detailed, guides for obtaining suburban access for "community-based" hunts, communications, identifying means, through public surveys, to discredit nonlethal solutions, and utilizing the media.

the public health system, the incidence of Lyme was not significantly different before or after hunting.

Source: ([Kugeler, et al. 2015<sup>7</sup>](#)) at the National Center for Emerging and Zoonotic Infectious Diseases, Division of Vector-Borne Diseases, Centers for Disease Control and Prevention.

## Access, Opposition, and the Law

The chief mission of the New Jersey Division of Fish and Wildlife is to serve the Fish and Game Council by furthering sport hunting opportunities and securing access to private and public lands for fellow hunters and clients.<sup>8</sup> Six of the council's eleven members represent private hunting and trapping clubs; the council nominates the division's director. The division is partnered with [sporting arms, archery, and fur trade associations](#).

<sup>7</sup> <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4912954/>

<sup>8</sup> "Issues Related to Hunting Access in the United States: California Results," a survey conducted for by the National Shooting Sports Foundation, "the trade association for the firearms industry," identified houses as perceived barriers to land. The study was paid for by a "Multi-State Conservation Grant" from the U.S. Fish and Wildlife Service and administered by the Association of Fish and Wildlife Agencies:

In looking at the ranking by the percentages saying the factor is a *major*, a *moderate*, or a *minor* problem, 4 of the 10 factors have at least 60% saying it is a problem: private land posted or closed because the landowner is concerned about liability (72%), closures of public land by government agencies (66%), poor management or allocation of uses of public land (65%), and housing and commercial development (61%).

**Percent who indicated that the following hunting access problems have been major in the past 5 years when hunting [species]. [Housing and private land was the chief hunter dissatisfaction]**

Q149. Housing or other developments making land not huntable	24
Q143. Private land blocking access to public land for hunting their primary species	23
Q140. Finding previously open private land posted or closed by the landowner	22
Q138. Being denied permission to hunt their primary species on somebody else's land	21
Q146. The cost of gas	21

Another survey, "Hunting Access and Crowding as Factors in Satisfaction or Dissatisfaction with Hunting," again conducted for the National Shooting Sports Foundation, cites houses and required safety zones (New Jersey's has been reduced from 400 to 150 feet for bows; at 151 feet, the property owner's permission is not required) as perceived barriers to huntable land:

In some cases, lack of access can mean that the hunter cannot find land on which to hunt—simply a lack of available land. Urbanization, for instance, can convert huntable land into nonhuntable land because of the presence of residential development. Such development not only takes away the actual house lot itself, but also removes land in a buffer around the development, because all states have laws that prevent shooting and hunting within a certain distance of houses and roads.

In 1998, the New Jersey Division of Fish and Wildlife conducted a study to identify "reasons for declining hunter activity." Hunters responded: "Not enough lands to hunt and limited access to these lands."<sup>8</sup> And not enough time.

Not surprisingly, researchers identify state wildlife agencies as the single greatest barrier to nonlethal solutions desired by the general public.<sup>9</sup>

Even so, the New Jersey Division of Fish and Wildlife is unduly hostile. The Maryland Department of Natural Resources, for example, has approved surgical sterilization as a deer-management technique. New Jersey staff continue to reject fertility control applications out-of-hand, misinform townships that sterilization “doesn’t work,” assert unreasonable “rules” that do not exist, provide poor quality and incorrect information – and impose client bow hunts. The desired result is that townships expect rejection, or no longer try.

In a particularly inexcusable case, the division rejected an application for sterilization in northern New Jersey involving Dr. DeNicola, the national expert, and a local veterinarian willing to provide free spaying and the use of his facilities, on farcical grounds. The township’s residents had voted for nonlethal solutions. Working with hunters, the state implemented an annual bow hunt instead.

### Stonewalling

In 2018, Dr. DeNicola remarked that he had been prevented from conducting fertility control in New Jersey for eleven (now thirteen) years. In the meantime, surgical sterilization in California, Maryland, Michigan, Ohio, Virginia and New York proceeds apace. This places New Jersey at a disadvantage.

New Jersey’s community-based deer management law allows townships to apply for a permit for deer management “other than traditional hunting”; listed non-lethal methods include surgical sterilization and immunocontraception, yet the New Jersey Division of Fish and Wildlife has not approved fertility control for well over a decade. In effect, the division has nullified the Legislature’s provision.

### The Phantom “Rule”

When a DeNicola immunocontraception program in Princeton proved successful, a division community hunt manager “came up with” an onerous “2000-foot rule” requiring the written

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<sup>9</sup> Kirkpatrick, J.F., & Rutberg, A.T. (2001). Fertility control in animals. In D.J. Salem & A.N. Rowan (Eds.), *The state of the animals 2001* (pp.183-198). Washington, DC: Humane Society Press. [http://animalstudiesrepository.org/cgi/viewcontent.cgi?article=1011&context=sota\\_2001](http://animalstudiesrepository.org/cgi/viewcontent.cgi?article=1011&context=sota_2001). “While the public is searching for new, humane approaches to solving conflicts with wildlife, state wildlife agencies persist in recommending hunting and its variations. Wildlife agencies in some states, such as New York, are required by law to promote recreational hunting (Marion 1987). But, more pervasively, most state agency personnel have strong cultural and political links to the hunting and trapping community. This community is (somewhat irrationally) hostile to the concept of nonlethal management of wildlife (Kirkpatrick and Turner 1995; Hagood 1997). Wildlife agencies’ advocacy of hunting and trapping is coupled with a reluctance to pursue or encourage research into other approaches. As a result, the public is turning elsewhere for solutions.”

permission of every property owner within a *2000-foot* radius. That, says Dr. DeNicola, stopped fertility control in its tracks.

The “rule,” used by shooting advocates to thwart fertility control in Essex County and elsewhere, doesn’t exist. In May of 2021, the Department of Environmental Protection regulatory authority confirmed to the Animal Protection League that apart from statutory language regarding written permission in impacted areas, the “2000” foot rule is not in the regulations or the statute.

### Outlier Studies

Going forward, state hunt managers should disclose materials produced by sources associated with trade associations and wildlife departments waging Titanic battles against fertility control.<sup>10</sup> For example, the “Human Dimensions Research Unit” (now the “Center for Conservation Social Sciences”) is a wildlife-use think-tank based at Cornell that principally represents sporting arms manufacturers.

A Cornell paper used by the industry to claim that sterilized females attract “more bucks” is an [outlier](#) with [unexplained anomalies](#) not seen or replicated in any other projects. Contradictory results were achieved in a very similar project in [San Jose, California](#). The paper’s heavily skewed sex ratio appears to be based on a camera survey analysis: at the beginning of the project, males comprised “only 4 percent” of the population when a “40 percent” male ratio is typically observed in suburban deer populations.<sup>11</sup> The study’s authors could not explain the anomaly.

Summary dismissal of community applications for fertility control should and can be challenged. State legislators are working to ensure that the public and its representatives are no longer thwarted in seeking its use.

Contact: For further information, please contact Susan Russell, wildlife policy director (732.219.9033, [selizabethrussell@verizon.net](mailto:selizabethrussell@verizon.net)) or Doris Lin, director of legal affairs, (732.616.8855 [dorislinessq@verizon.net](mailto:dorislinessq@verizon.net)), Animal Protection League of New Jersey.

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<sup>11</sup> G. Kent Webb (2017). “INFORMATION ACQUISITION AND DECISION SUPPORT FOR SUBURBAN DEER MANAGEMENT.” *Issues in Information Systems*, Volume 18, Issue 2, pp. 158-170, 2017



## Deer and Forest Health

The conservation *idée fixe* of scapegoating deer and applying broad generalities and “potential” damage to all situations has earned resistance from world-class authorities.

Oswald Schmitz, Ph.D., the forest ecologist, senior associate dean of research and director of doctoral studies; Oastler professor of population and community ecology (and from 2011-2018 director, Yale Institute for Biospheric Studies), Yale School of the Environment, [refuted](#)<sup>h</sup> a claimed need to kill deer in Rock Creek Park, Maryland. Adverse effects were “patently overstated,” wrote Schmitz. “The study shows the opposite, that deer eat tree seedlings in the Park, but that this particular reduction in the number of tree seedlings has no measurable effect on forest regeneration.” When discrediting the science used to support a deer kill on Jekyll Island, Georgia, Dr. Schmitz strongly challenged the “precautionary deer killing” rationale behind S2419:

“Finally, there is no scientific evidence presented in the Draft Summary, and I am not aware of any in the wildlife science literature, to support the idea that precautionary deer culling is needed to prevent future deer damage.” (Assessment of scientific methods and data in support of the Jekyll Island deer management recommendation, 2014).

Yale University studies<sup>12</sup> (2010) determined that deer density was not a leading factor in determining variation in vegetation impacts in Connecticut: “The empirical basis for presumptions that white-tailed deer cause forest regeneration failure is limited.”<sup>i</sup> Regeneration problems blamed on deer in South Mountain Reservation, opines Dr. Schmitz, is largely due to invasive jumping worms.

Forest canopy means fewer deer. Unpopular<sup>j</sup> logging and burns for upland, small “game” animals create more deer. Ongoing management, much of it on stewardship lands, for the purpose of producing trophy males and increased overall deer numbers includes [deer plots](#), bait, and deer-preferred crops on Wildlife Management Areas, lands leased for hunting, and fee-hunt farmlands.

The acreage is substantial. At a minimum, the Forest Stewardship Program alone covers over 155,000 acres, and counting. Shooting clubs lease significant acreage. The Farmland Assessment Program covers over 250,000 acres statewide. Farmed land is over 700,000 acres.

### Summarizing Articles, Logging:

<https://www.insidernj.com/new-jersey-audubon-not-national-audubon/>.

Related news article:

[https://www.newjerseyhills.com/print\\_only/headline\\_style/bold\\_48/environmental-groups-spar-over-highlands-forestry-plan/article\\_de040f56-06b0-5d01-9758-7f330a1c0c75.html](https://www.newjerseyhills.com/print_only/headline_style/bold_48/environmental-groups-spar-over-highlands-forestry-plan/article_de040f56-06b0-5d01-9758-7f330a1c0c75.html).

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<sup>12</sup> **Rutherford, A. C. and O. J. Schmitz.** “Regional-Scale Assessment of Deer Impacts on Vegetation within Western Connecticut, USA.” *Journal of Wildlife Management* 74.6 (2010): 1257-1263. DOI: [10.1111/j.1937-2817.2010.tb01246.x](https://doi.org/10.1111/j.1937-2817.2010.tb01246.x)

## Bait

Baiting for deer and bear is banned in New York and Pennsylvania, yet encouraged in New Jersey, where it is used extensively in sport/trophy killing of deer and bear, in “stewardship” deer kills, and after burns and logging.

Comprehensive reviews in [Canada](#)<sup>k</sup> and reviews in the United States confirm that baiting increases [deer density, reproduction, and conflict](#).<sup>l</sup> It spreads transmission of chronic wasting and other diseases. Deer-car collisions are higher in baited areas. In multiple studies, baiting causes changes in tree species composition and retards forest regeneration by concentrating deer that continue to feed on natural browse. Bait increases predation on ground-nesting birds.

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<sup>a</sup> <https://www.caryinstitute.org/news-insights/press-release/forest-ecology-shapes-lyme-disease-risk-eastern-us>

<sup>b</sup> <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4912954/>

<sup>c</sup> [https://esajournals.onlinelibrary.wiley.com/doi/abs/10.1890/0012-9658\(2006\)87%5B1981:LDALTT%5D2.0.CO%3B2](https://esajournals.onlinelibrary.wiley.com/doi/abs/10.1890/0012-9658(2006)87%5B1981:LDALTT%5D2.0.CO%3B2)

<sup>d</sup> <https://academic.oup.com/jme/article-abstract/30/1/144/2221252>

<sup>e</sup> <https://academic.oup.com/jme/article-abstract/34/4/461/2221625>

<sup>f</sup> <https://academic.oup.com/jme/article-abstract/36/3/376/919239>

<sup>g</sup> <https://academic.oup.com/jme/article-abstract/41/4/779/885126>

<sup>h</sup> [https://apl.nj.org/wp-content/uploads/2021/05/Petition\\_Rock\\_Creek.pdf](https://apl.nj.org/wp-content/uploads/2021/05/Petition_Rock_Creek.pdf)

<sup>i</sup> <http://www.lohvnj.org/G-RutherfordSchmitz2010.pdf>

<sup>j</sup> <https://www.tapinto.net/towns/sparta/articles/environmental-groups-oppose-sparta-mountain-logg>

<sup>k</sup> [http://www.cwhc-rssf.ca/docs/technical\\_reports/wildlife\\_baiting.pdf](http://www.cwhc-rssf.ca/docs/technical_reports/wildlife_baiting.pdf)

<sup>l</sup> <https://tinyurl.com/AlabamaBaiting>