

**Croton-on-Hudson's Conservation Advisory  
Council Recommendations for Controlling the  
White-Tailed Deer Population**

**March 8, 2010**

## **The Current Deer Situation in Croton**

Throughout Westchester County, the white-tailed deer population has reached crisis levels. This has contributed to County-wide property damage, the spread of tick-borne diseases, increased deer-vehicle collisions, and a threatened ecosystem. Although the negative impacts caused by overpopulation of deer can be seen separately, all must be considered as threats to our community. The problem is not that there are deer; the problem is that the extraordinarily large deer population has caused a dramatic imbalance with consequences throughout the ecosystem. The overpopulation is confirmed by frequent observation of deer browsing in our neighborhoods and open spaces, the not uncommon sight of deer carcasses along the roadside, and the evidence of our devastated landscapes and woodland understories.

The destruction of our landscape is readily apparent to all. This plentiful food supply of highly nutritious plant material supplied by homeowners has contributed to the overpopulation problem. Moreover, suburbia has not eliminated deer habitat so much as more accurately created deer habitat, as deer prefer the “fringe” environment between woodland and open lawn.<sup>i</sup> However, most homeowner landscape problems can be minimized by planting species that deer find less palatable, regularly using deer deterrent sprays, and fencing, or more likely, a combination of all three.<sup>ii</sup> Landscape destruction is the impact that is most commonly experienced but certainly the least “dire”.

## **Tick-borne Diseases**

According to the Center for Disease Control (CDC), in 2008 there were 5,741 confirmed reported cases of Lyme disease in NYS out of 28,921 cases in the U.S. (a 5% increase from the year before).<sup>iii</sup> It is speculated by the CDC that only 10% of cases were reported.<sup>iv</sup> The rate of Lyme Disease is 6/100,000 population for the U.S., 29/100,000 for NY State, and has averaged between 60-70/100,000 in Westchester County for the past several years.<sup>v</sup> Two relatively new and potentially more deadly diseases, Human Ehrlichiosis and Babesiosis, are also transmitted by deer ticks in Westchester County.<sup>vi</sup>

Deer play a significant role in the life-cycle of the deer tick and the spread of tick-borne disease, but are not the only source of the problem.<sup>vii</sup> The white-footed mouse is the primary reservoir for *Borrelia burgdorferi*, the causative bacteria in Lyme Disease, but has a relatively small territorial range of only a few hundred square feet for each mouse.<sup>viii</sup> In contrast, white-tailed deer can cover a territorial range just under a mile but can travel several miles<sup>ix</sup>, are the

preferred feeding host of the adult ticks and carry the bacteria in their blood stream. Significantly, the incidence of tick-borne diseases mirrors "deer density," with southern Westchester showing fewer reported cases than northern Westchester.<sup>x</sup>

## **Public Safety**

According to the Insurance Institute for Highway Safety there are an estimated 1.5 million deer-vehicle collisions annually in the United States, causing more than 150 fatalities and \$1.1 billion in property damage.<sup>xi</sup> In NYS annually, roughly 2 to 5 fatalities and more than 1,300 injuries are associated with DVC incidents<sup>xii</sup>. In 2008, DVC incidents accounted for 7.2 percent of all auto accidents in NYS, up from just over 2 percent in 2004.<sup>xiii</sup> The Croton police estimate that during the rut season and early winter, there are roughly 3 deer-vehicle collisions in the Croton area each month.<sup>xiv</sup> Nationally, car damage averages about \$3050 for each DVC.<sup>xv</sup>

## **Environmental Damage**

However, it is the destruction of the environment and the ecosystem that has, in the past thirty years, rapidly become a reason for action throughout Westchester and Fairfield counties, as well as in the greater tri-state area. The direct threat from over-browsing is devastating to trees, shrubs, the majority of herbaceous forbs, shrub-nesting songbirds, insects, amphibians, reptiles, smaller mammals and, ironically, the health of the deer population itself. Furthermore, with the denuded forest floor and loss of a healthy root system, deer over-browsing has led to soil erosion and contributed to degradation of water quality. According to Dr. Mike Rubbo, Teatown Reservation's Director of Environmental Stewardship, reduced bio-diversity has also been linked to increased incidences of Lyme disease.<sup>xvi</sup>

In a recent three-year study of deer overpopulation in Westchester by the Westchester Citizens Deer Task Force, among the alarming findings at Ward Pound Ridge Reservation was that 91.5% of the test areas showed zero regeneration of forest growth.<sup>xvii</sup> This same effect can be seen locally in areas such as the Saw Mill River Audubon's Graff sanctuary where there is no re-growth of trees and bio-diversity has been reduced to a few species including ferns, grasses, moss, invasive winged Euonymus, native Spicebush, invasive grape and bittersweet vines, wild raspberry brambles and wild multiflora roses. Eating 4 to 8 lbs. of forage per day, each deer

consumes approximately one ton of vegetation annually.<sup>xviii</sup> What is created is a park-like habitat with tall trees, lacking an understory. Many find this aesthetically pleasing, but it is a biologically depleted “deer savannah,” where a distinct browse line can be seen throughout the forest.

Wildlife Biologist Dr. David deCalesta, one of the pre-eminent researchers of the effect of deer population on the environment in the PA, NY, NJ region, commented that in his 30 years’ experience, Westchester had the “worst” situation and was “on the verge of ecological collapse.”<sup>xix</sup> Studies by deCalesta and others have indicated severe damage to the ecosystem occurs when deer density exceeds 20 deer per square mile.<sup>xx</sup>

In Croton, deer herd density is broadly estimated at 45 to 65 deer per square mile. Accurate estimates of deer herd density are difficult to ascertain and expensive (the FLIR thermal imaging/infrared camera flyover of the Kensico Dam cost roughly \$5,000 in 2006).<sup>xxi</sup> With roughly 5 square miles of land in Croton, our deer population can be estimated at 225 to 325 deer. Ideal biologically and socially sustainable levels are roughly 10 to 15 deer per square mile. For Croton, that means roughly 50 to 75 deer would be a biologically sustainable population.

### **Population control methods**

In order to protect our forests, we believe that it is essential for Croton to take measures to reduce the deer population. Population control methods include (i) trapping and relocating; (ii) exclusion and exclosures; (iii) immunocontraception; (iv) introducing natural predators; (v) general hunting; (vi) controlled hunting; and (vii) professional culling.

Doing nothing is the current de facto strategy, resulting in the current situation. Because of the competition for food during the winter, many deer suffer slow starvation which typically ends with most deaths occurring in mid-March.<sup>xxii</sup> Often the stomachs are full, but with indigestible plant material. So, doing nothing can be seen as a cruel and socially and environmentally irresponsible option.

Trapping and relocating is illegal in New York State, largely having to do with the threat of spreading the Chronic Wasting Disease.<sup>xxiii</sup> And the cost of relocating can be prohibitive: roughly \$110 to \$800 per deer and unfortunately 30% to 85% display a kind of muscular shock when relocated and starve to death.<sup>xxiv</sup>

Exclusion and exclosures or fencing is impractical, expensive and can have deleterious effects on other wildlife.<sup>xxv</sup> Exclosures, natural areas that are fenced off from the deer to allow for “normal” growth of the forest and wildlife, are more often used as public demonstrations of the deer problem and also to preserve species in a small area.

Immunocontraception using the pig hormone Porcine zona pellucid (PZP) is currently still in the experimental stage and has yet to gain FDA approval.<sup>xxvi</sup> PZP Immunocontraception is best used on deer in confined spaces and is more commonly used in zoos and on horse farms.<sup>xxvii</sup> In the process, each doe is shot with a tranquilizer, ear tagged and injected with PZP, which blocks conception. Later during that same year, each doe must be located and inoculated a second time with a dart containing the PZP hormone. Although the contraception is over 90% effective and its application lasts for one year, accordingly each doe must be located and injected annually.

Possible complications related to PZP include a prolonged rut season and subsequent increase in deer-vehicle collisions and also increased starvation in males (who, as an indirect effect of PZP, are preoccupied with reproduction much further into the early winter months). Costs are roughly \$360 per shot and applied over the life of each deer, can cost approximately \$3700 per deer (during which time they continue to cause problems related to the environment, vehicles, tick-borne diseases and property damage).<sup>xxviii</sup> The more practical problem, outside of a confined location, is finding and re-shooting the gun-shy does. Experienced wildlife expert Rod Christie, director of the Mianus River Gorge commented, “You can shoot a deer easily once, after that, they don’t like to be shot again.”<sup>xxix</sup> Despite logistical and financial impracticalities, it is the “preferred method” of deer population control among those in opposition to hunting. Immunocontraception is the method preferred by the Humane Society, the single dissenting voice to the Westchester Citizens Deer Task Force report.<sup>xxx</sup>

A surgical non-lethal birth control, tubal ligation by venatral laparotomy, provides a form of sterilization with low mortality in white-tailed deer (sterilized deer have been shown to not live as long as control deer). After start-up costs, surgical alternatives run roughly \$750 deer.<sup>xxxi</sup> As even one buck can impregnate several does during the rut, the effect on the herd size may be negligible until a significant percentage of bucks have been sterilized.

## **Predators**

Lethal methods of controlling the deer population include the four-legged natural predators.<sup>xxxii</sup> Of the best deer hunters, primarily preying on the fawns, are the pack hunters including wolves, coyotes and lastly packs of domestic dogs. Bobcats are also capable of taking out the older or younger deer. The rising deer population in Croton has brought more coyotes to our area. A viable coyote population may help in the long run to stabilize the herd. As coyotes can take out a large percentage of the fawn population, their role in reducing the deer population in the long term should be considered as having some benefit. However, homeowners typically have a negative reaction to living among natural predators.

## **Hunting and Culling**

The primary lethal methods of control include general sport hunting, controlled hunting and professional culling. Professional culling involves hiring sharpshooters using either a single shot shotgun or, the preferred, high-powered air rifle (regular rifles are not allowed in Westchester County). Culling can be quite efficient and effective and many people feel more comfortable knowing that the hunters doing the culling are typically off duty police officers. Costs are dependent on the number of deer harvested each day, but average between \$250 and \$350 per deer.<sup>xxxiii</sup> Baiting, to attract deer, and thereby to increase the effectiveness of the cull, is currently against NYS hunting laws which cannot be superseded (the NYS DEC is now reviewing the laws against baiting in combination with culling).<sup>xxxiv</sup> It is supposed that without bait, the number of deer harvested would not be significantly greater than through bow hunting.

Perhaps more than the difference in weapons, the major difference between culling and controlled hunting is financial. One of the great advantages of hunting is that it is largely “free,” with hunters contributing their own time, the cost of their own equipment, and sometimes even donating the cost of preparing the venison (roughly \$50) which is then donated to food banks.<sup>xxxv</sup> The difference between general sport hunting and controlled hunting is that while general sport hunting is open to anyone with a permit, the proficiency tests and classroom requirements are much more rigorous for those wishing to participate in controlled hunting. In fact, Westchester County has the strictest requirements for controlled hunting in NYS.<sup>xxxvi</sup>

In the recent controlled hunting program initiated in Westchester County, participants in the program had to pass a skill test that required hitting a 9” target at 75 feet, three out of three times.<sup>xxxvii</sup> Furthermore, participants, chosen by lottery, are required to attend mandatory orientation, and moreover required to check in and out by phone or by signing a log each day

hunting. Once accepted into the program, controlled hunters are required to hunt a certain number of days. All controlled hunters use portable tree stands with a full body harness. When hunting, controlled hunters are identified by special tags, their tree stands are tagged and their vehicles display a special tag. Of the 50 hunters selected in 2008, in first year short season (11/7 – 12/31), 20 hunters were successful at harvesting a total of 45 deer at Muscoot and Lasden Arboretum.<sup>xxxviii</sup> The full report on the 2008 season has yet to be released but it is expected to be out by mid-March, 2010.

In addition to helping to control the deer population, regulated controlled hunting generates side benefits. At the sites where regulated hunting is allowed, the legal hunters are able to act as a kind of policing agent to ask unauthorized hunters to leave the area and to turn in unauthorized (untagged) hunting tree-stands to the local police station. In the Bedford Audubon Sanctuary, hunters also take notes of interesting birds and animals sighted and help with environmental clean-up days out of hunting season.

Perhaps the greatest residual benefit is that the deer meat (venison) can be donated to the hungry and needy of Westchester County. Concurrent with the deer overpopulation crisis, the recent financial crisis has shown increased use of the Westchester food banks and reduced donations. The venison from one deer can provide a meal for more than 160 people. In a 10-year period in Connecticut, hunters have donated 41,000 pounds of venison to food charities, contributing to over 164,000 meals, valued at over \$204,000.<sup>xxxix</sup>

Given the estimated number of deer in Croton (225 to 325 total), the goal would be to reduce the deer population by between minimally 150 and as many as 275 deer. If we were to use \$700 as a rough minimal figure per deer, for all the controls, i.e. from professional culling to surgical sterilization or relocating, the costs of bringing the current Croton deer population in balance with the environment would range between \$105,000 and \$192,500. In some cases, additional fees such as training or set-up fees would add to these basic costs. However, not all control alternatives carry such a high financial burden. In controlled hunting, for example, the costs to the Village are negligible.

### **Recommendation of the CAC**

It is the recommendation of the CAC that the Village of Croton begin to plan for the controlling the deer population within the Village. Of all the available lethal methods, the CAC recommends

that the Village approve a plan for tree-stand/bow and arrow hunting by qualified hunters (who successfully complete a competency test as administered by the Westchester Bowhunters Association<sup>xi</sup>) who will be allowed to hunt on a yearly basis.

By unanimous vote, the CAC supports the use of controlled hunting as an effective method of reducing the deer population. The CAC does not advocate hunting any species other than deer, including coyote “pest control” and turkey “sport hunting.” We suggest that the Village look to work with local nature sanctuaries, including the Graff and Brinton Brook Saw Mill River Audubon sanctuaries and the Croton Arboretum, large private commercial properties such as the Hudson National Golf Course, Westchester County property including Croton Point Park as well as property along the Croton River Gorge. The NYS DEC encourages and the Croton CAC recommends that controlled hunting also include private property which conforms to NYS DEC guidelines and rules regarding time of day, time of year, and required permission of anyone dwelling within 500ft. of the hunting property.

The most urgent concern is, of course, ensuring public safety. The CAC believes that controlled bow hunting with hunters shooting downward from moveable tree-stand locations, as vetted by the Westchester Bowhunters Association, is a safe and humane method of deer population control. It is recommended that the Village request that “only ethical shots” (defined as shots where the hunter believes with great certainty that the unobstructed shot will be fatal) be taken when hunting deer and that all deer are tracked and retrieved. Volunteer groups such as Deer Search are available to help track all wounded deer which are able to wander away from the hunting area.<sup>xli</sup> It is hoped that most of the venison would be donated to one or more Westchester food banks.

Whether or not the land is posted, New York State General Obligations Law protects landowners from liability for non-paying recreationists engaged in hunting, trapping and fishing on their property.<sup>xlii</sup>

A map and pin system could be used to identify potential hunting areas and checked-in hunters in each of those locations. That check-in would be at the Croton Police Station -- as check-in is usually at or before dawn, this would save the village from needing to hire an “overseer.” It is hoped that the police would also be willing to collect the records of deer harvested by noting location, sex, weight (if possible), and buck antler characteristics (i.e., basal circumferences, points, main beam lengths, and spread), to help determine the health of the herd.



It is recommended that the Village of Croton-on-Hudson work with other nearby communities, including Hastings, Dobbs Ferry, Greenburgh, Tarrytown, Somers, and Pound Ridge, as well as the Westchester County Parks Commission and the NYS DEC, to share information and pool resources toward public education, program evaluation, and the operations of deer population control. With promises of advancements in immunocontraception and an increasing coyote population, the CAC suggests that Croton regularly revisit its strategy in achieving a biologically sustainable deer population.

Although the CAC does not recommend culling at this time, we do not recommend against culling nor do we object to it being considered in the future (especially if baiting is permitted). If culling is to be considered, we would favor the use of high-powered air rifles. The noise factor of single-shot shotguns as opposed to the relative silence of high powered air rifles makes shotguns less desirable in an area as densely populated as Croton-on-Hudson.

It is suggested that public education focusing on the need for deer population management be initiated. This may be accomplished through information on the Village Web site, distribution of information via pamphlet, public presentations and discussions, and by making books concerning the problem of deer overpopulation available at the Croton Free Public Library. It is important that the public realize that this is not so much a case of “allowing hunting in Croton” as taking action in deer management to control the herd population – for the benefit of both flora and fauna and also for the better health of the deer herd.

The “Community Forum on Deer Overpopulation in Croton” held last fall at the Croton Library indicated at least several interesting considerations.<sup>xliii</sup> First, of the roughly 100 people attending, only six were in opposition to lethal methods. Three of the six in opposition were tremendously passionate about not wanting the deer to be killed. Of the six, three were in opposition to every control or recognition of a legitimate problem. Two were opposed to hunting in Westchester, but not in other states, so the opposition was more toward the local issue than the ethics of hunting. One favored the return of natural predators. The Village should be aware that passions run high on the issue of deer management, largely by those opposed to any lethal methods which include hunting.

The CAC also suggests that the Village’s program of deer population management, methods used, and the need for lethal methods of control, be part of an adaptive process which reviews the findings of the previous year.

An increased coyote population may have enough of an impact that controlled hunting or culling could be cut back or eliminated in the future. There is also the possibility that Chronic Wasting Disease could enter the area and have a devastating effect on the deer population. Whatever the future holds, the current situation is untenable and immediate action must be taken.

■ Mark Magel CAC 3-1-10

---

<sup>i</sup> Lavendel, Brian. Living with deer: we've moved into their neighborhood. Now guess who's coming to dinner, *Animals Magazine*, Fall 2002,  
[http://findarticles.com/p/articles/mi\\_m0FRO/is\\_4\\_135/ai\\_93204522/](http://findarticles.com/p/articles/mi_m0FRO/is_4_135/ai_93204522/) Accessed 3/6/10

<sup>ii</sup> <http://www2.dnr.cornell.edu/ext/chdp/Reducingdeerdamage.htm> Accessed 3/06/10

<sup>iii</sup> Center for Disease Control, Division of Vector-Borne Infectious Diseases: Lyme Disease, Reported Lyme Disease Cases State-by-State 1999-2008.  
[http://www.cdc.gov/ncidod/dvbid/lyme/ld\\_rptdLymeCasesbyState.htm](http://www.cdc.gov/ncidod/dvbid/lyme/ld_rptdLymeCasesbyState.htm)

<sup>iv</sup> Business Wire, 11/30/06 <http://www.allbusiness.com/services/business-services/3964468-1.html> Accessed 3/1/10

<sup>v</sup> Adel, Harold N., M.D., M.P.H., Commissioner, Huang, Ada J., M.D., Deputy Commissioner for Disease Control, 1998, <http://www.westchestergov.com/HEALTH/ccJun98.htm> Accessed 2/20/10

<sup>vi</sup> [http://health.westchestergov.com/index.php?option=com\\_content&task=view&id=1362&Itemid=3014](http://health.westchestergov.com/index.php?option=com_content&task=view&id=1362&Itemid=3014) Accessed 3/06/10

<sup>vii</sup> Deer Tick Ecology, American Lyme Disease Foundation, last updated January 5, 2010,  
<http://www.aldf.com/deerTickEcology.shtml> Accessed 3/06/10

<sup>viii</sup> T G Schwan, K K Kime, M E Schrupf, J E Coe, and W J Simpson, Antibody response in white-footed mice (*Peromyscus leucopus*) experimentally infected with the Lyme disease spirochete (*Borrelia burgdorferi*). *Infection and Immunity*, November 1989; 57(11): 3445–3451.  
<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC259851/> Accessed 3/06/10

<sup>ix</sup> Saunders, D. A. 1988. Adirondack Mammals. State University of New York, College of Environmental Science and Forestry. 216pp.

<sup>x</sup> Thomas J. Daniels, Theresa M. Boccia, Shobha Varde, Jonathan Marcus, Jianhua Le, Doris J. Bucher, Richard C. Falco, and Ira Schwartz, Geographic Risk for Lyme Disease and Human

---

Granulocytic Ehrlichiosis in Southern New York State *Applied and Environmental Microbiology*, December 1998, p. 4663-4669, Vol. 64, No. 12, 0099-2240/98/  
<http://aem.asm.org/cgi/content/full/64/12/4663> Accessed 3/06/10

<sup>xi</sup> Insurance Institute for Highway Safety. Press Release, November 18, 2004  
[http://www.iihs.org/news/2004/iihs\\_news\\_111804.pdf](http://www.iihs.org/news/2004/iihs_news_111804.pdf)

<sup>xii</sup> New York State Department of Transportation Safety Information Management System as reported in Deer Vehicle Crash Information Clearinghouse  
[http://www.deercrash.com/states/new\\_york.htm](http://www.deercrash.com/states/new_york.htm) Accessed 3/6/10

<sup>xiii</sup> Ibid.

<sup>xiv</sup> September 09 - 3 Reported and 2 Left Scene.  
October 09 - 2 Reported  
November 09 - 3 Reported  
December 09 - 1 Reported and 2 Left Scene  
January 10 - 2 Reported

---

Total	11	Reported	and 4 Left Scene
-------	----	----------	------------------

As reported 3/08/10 by Lt. Russel H. Harper, Patrol Lieutenant, Croton Police Department, Croton on Hudson, NY. 10520

<sup>xv</sup> Deer-Vehicle Collision Frequency Jumps 18 Percent In Five Years, State Farm Insurance Press Release, September 28, 2009  
[http://www.statefarm.com/about/media/media\\_releases/20090928.asp](http://www.statefarm.com/about/media/media_releases/20090928.asp) Accessed 3/6/10

<sup>xvi</sup> Rubbo, Dr. Michael, Biodiversity and Why It Matters, Lecture presented September 15, 2009 at the Croton Free Public Library, 171 Cleveland Drive, Croton-on-Hudson

<sup>xvii</sup> Westchester Citizen's Deer Task Force on White-tailed Deer and Forest Regeneration, October 28, 2008, p. 3, <http://www.westchestergov.com/parks/pdfs/DeerTaskForce/DeerReport.pdf>  
Accessed 3/06/10

<sup>xviii</sup> Causey, Dr. Keith, "Supplemental Feeding of White-Tailed Deer with Soybeans", 1997, School of Forestry & Wildlife Sciences Extension, Auburn University, Alabama <http://www.aces.edu/forestry/wildlife/supplementaldeerphp.php> Accessed 3/06/10

<sup>xix</sup> Greenburgh Nature Center Forum on Deer and Biodiversity, November 12, 2009, Greenburgh Nature Center, Scarsdale, NY.

<sup>xx</sup> Tilgman, Nancy G. , "Impacts of White-Tailed Deer on Forest Regeneration in Northwestern Pennsylvania", *The Journal of Wildlife Management*, Vol. 53, No. 3 (Jul., 1989), pp. 524-532

---

<http://www.deerandforests.org/resources/impacts-of-white-tailed-deer-on-forest-regeneration.pdf>  
Accessed 3/06/10

McGuinness, Barbara and deCalesta, David. White-tailed Deer Alter Diversity of Songbirds And Their Habitat in Northwestern Pennsylvania, *Pennsylvania Birds*, 1996, Volume 10, Number 2, pp. 55-56 <http://www.deerandforests.org/resources/White-tailed%20Deer%20Alter%20Diversity.pdf>  
Accessed 3/06/10

<sup>xxi</sup> Fred Gliesing, Senior Forester/Forestry Coordinator Division of Watershed Lands and Community Planning NYC DEP Bureau of Water Supply, November 16, 2009.

<sup>xxii</sup> Malnutrition and Starvation, Michigan Department of Natural Resources,  
[http://www.michigan.gov/dnr/0,1607,7-153-10370\\_12150\\_12220-26946--,00.html](http://www.michigan.gov/dnr/0,1607,7-153-10370_12150_12220-26946--,00.html) Accessed  
3/06/10

<sup>xxiii</sup> A Citizen's Guide to the Management of White-tailed Deer in Urban and Suburban New York, New York State Department of Environmental Conservation, p. 7 <http://www.all-creatures.org/hope/DOE/4%20-%20Deer%20Management%20in%20Urban%20and%20Suburban%20New%20York.pdf>  
Accessed 3/06/10

<sup>xxiv</sup> Nelson, Richard, 1998, Heart and Blood: Living with Deer in America. pp. 128 – 133. New York: Vintage Books.

<sup>xxv</sup> Summary of Urban Deer Management Methods, Resource: A Manual For Deer Management In Urban and Suburban Areas of Kansas, Kansas Department of Wildlife & Parks, January 2002  
<http://www.all-creatures.org/hope/DOE/4%20-%20Summary%20of%20Deer%20Management%20Methods.pdf> Accessed 3/06/10

<sup>xxvi</sup> Curtis, Paul D., Richmond, Milo E., Miller, Lowell A. , Quimby, Fred W., Pathophysiology of white-tailed deer vaccinated with porcine zona pellucida immunocontraceptive, Received 13 September 2006; received in revised form 9 March 2007; accepted 20 March 2007, Available online 11 April 2007  
[http://docs.google.com/viewer?a=v&q=cache:DGWTVYCRt0QJ:ddr.nal.usda.gov/bitstream/10113/4248/1/IND43957244.pdf+ddr.nal.usda.gov/bitstream/10113/4248/1/IND43957244.pdf&hl=en&gl=us&pid=bl&srcid=ADGEESj0sHmeiny7YAIPKyCroLMF-a-BBdFx1HSgQjFoH6qmXdZLFs1H-5GIJfDuJ8Uq\\_YrnHE84FJoyW\\_4c9aHKRbpmI13Nyhj6nLCsz2iS6akHB-Tx0MYw6mm5bXixqh6ZLmSoDcoM&sig=AHIEtbSg4J9IMNynwpldggXK-ioAcxFFkw](http://docs.google.com/viewer?a=v&q=cache:DGWTVYCRt0QJ:ddr.nal.usda.gov/bitstream/10113/4248/1/IND43957244.pdf+ddr.nal.usda.gov/bitstream/10113/4248/1/IND43957244.pdf&hl=en&gl=us&pid=bl&srcid=ADGEESj0sHmeiny7YAIPKyCroLMF-a-BBdFx1HSgQjFoH6qmXdZLFs1H-5GIJfDuJ8Uq_YrnHE84FJoyW_4c9aHKRbpmI13Nyhj6nLCsz2iS6akHB-Tx0MYw6mm5bXixqh6ZLmSoDcoM&sig=AHIEtbSg4J9IMNynwpldggXK-ioAcxFFkw) Accessed  
3/06/10

<sup>xxvii</sup> Lowell A. Miller, Lowell A., Johns, Brad E., Killian Gary J., USDA/National Wildlife Research Center, "Long-term effects of PZP immunization on reproduction in white-tailed deer", Received 12 December 1998; revised 30 March 1999; accepted 30 March 1999. Available online 11 October 1999. [http://www.sciencedirect.com/science?\\_ob=ArticleURL&\\_udi=B6TD4-3XM2T0R-](http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6TD4-3XM2T0R-)

---

[V&\\_user=10&\\_coverDate=10%2F14%2F1999&\\_rdoc=1&\\_fmt=high&\\_orig=search&\\_sort=d&\\_doanchor=&view=c&\\_searchStrId=1237061677&\\_rerunOrigin=google&\\_acct=C000050221&\\_version=1&\\_urlVersion=0&\\_userid=10&md5=9b102234cae119ed6008041a23a2698e](#) Accessed 3/06/10

xxviii Marrett Grund, Marrett, and McAninch, Jay, "Simulating the Use of Immunocontraception to Control an Urban Deer Population" referenced in Winard, C.J. "Deer Contraceptives (Part II)", [http://www.bowsite.com/bowsite/features/armchair\\_biologist/immunocontraception/pill2.htm](http://www.bowsite.com/bowsite/features/armchair_biologist/immunocontraception/pill2.htm) Accessed 3/06/10

xxix Greenburgh Nature Center Forum on Deer and Biodiversity, November 12, 2009, Greenburgh Nature Center, Scarsdale, NY.

xxx Minority Report, Submitted by Deer Task Force member Laura Simon, Field Director, Urban Wildlife Program, The Humane Society of the United States, Nov 21, 2008  
<http://www.hsus.org/web-files/PDF/wildlife/westchester-minority-report.pdf> Accessed 3/06/10

xxxi Evaluation of a Trap-Sterilize-Release Program for White-tailed Deer Management in Highland Park, Illinois, 2002-2005. Prepared for the Highland Park City Council, September 12, 2005 by Nancy E. Mathews, Ph.D., Gaylord Nelson Institute for Environmental Studies, University of Wisconsin-Madison

xxxii Koerth, Ben. "Are Predators Hurting Your Whitetail Herd?", North American White Tail  
[http://www.northamericanwhitetail.com/deermanagement/wt\\_102predators/](http://www.northamericanwhitetail.com/deermanagement/wt_102predators/) Accessed 3/06/10

xxxiii Deer Management Implementation Plan, Deer Management Advisory Committee, Rochester Hills, Michigan, July 14, 2008, p. 4,  
[http://www.rochesterhills.org/our\\_government/uploads/DEER\\_MANAGEMENT\\_IMPLEMENTATION\\_PLAN\\_07\\_09.pdf](http://www.rochesterhills.org/our_government/uploads/DEER_MANAGEMENT_IMPLEMENTATION_PLAN_07_09.pdf) Accessed 3/06/10

xxxiv In New York, it is illegal to feed deer by putting out any material that attracts deer to feed," Part 189 of Title 6 of the Codes, Rules and Regulations of the State of New York,  
<http://www.dec.ny.gov/animals/7197.html> Accessed 2/24/10

xxxv <http://foodbankforwestchester.org/index.shtml> Accessed 11/06/09

xxxvi Kevin Clark, NYS DEC comment at Greenburgh Nature Center Forum on Deer and Biodiversity, November 12, 2009, Greenburgh Nature Center, Scarsdale, NY.

xxxvii Doug Erickson, President Westchester County Bowhunters Association, Croton Community Forum on Deer Overpopulation, October 22, 2009, Croton Free Public Library, 171 Cleveland Drive, Croton-on-Hudson, NY

xxxviii Dan Aitchison, Curator & Wildlife Biologist, County of Westchester. 2/04/10

---

<sup>xxxix</sup> Connecticut Department of Environmental Protection, "Managing Urban Deer in Connecticut" p. 21, June, 2007, , <http://www.ct.gov/dph/lib/dph/urbandeer07.pdf>

<sup>xi</sup> Westchester County Bowhunters Association, P.O. Box 918, Yonkers, NY 10703, <http://www.westchesterbowhunters.com/> Accessed 3/06/10

<sup>xii</sup> <http://www.deersearch.org/index.htm> Accessed 11/06/09

<sup>xiii</sup> NY General Obligations Law, Article 9, Obligations of Care, Title 1. Conditions on Real Property, § 9-103: 1-3

<sup>xiiii</sup> Croton Community Forum on Deer Overpopulation, October 22, 2009, Croton Free Public Library, 171 Cleveland Drive, Croton-on-Hudson, NY.