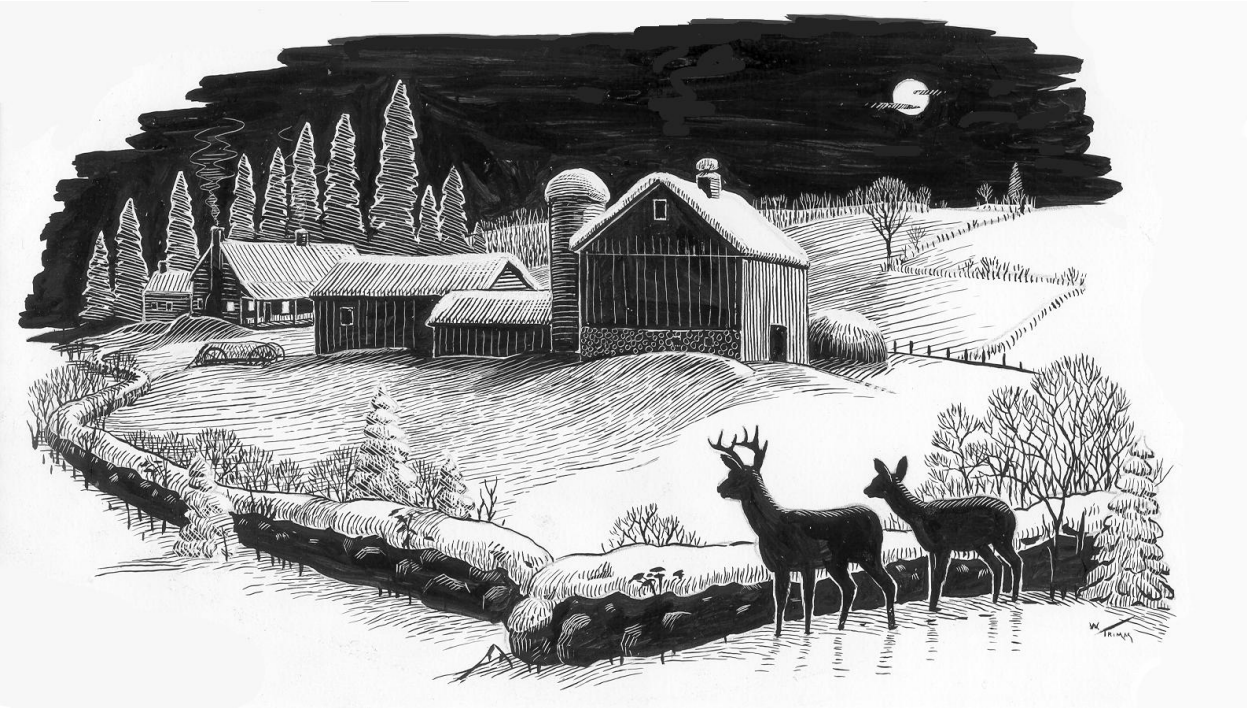
New York State
Department of Environmental Conservation

Management Plan for White-tailed Deer in New York State 2011-2015



Division of Fish, Wildlife and Marine Resources
Bureau of Wildlife

June 2011

NYS Deer Management Plan

Mission of the Bureau of Wildlife

To provide the people of New York the opportunity to enjoy all the benefits of the wildlife of the State, now and in the future. This shall be accomplished through scientifically sound management of wildlife species in a manner that is efficient, clearly described, consistent with law, and in harmony with public need.

Goals of the Bureau of Wildlife

Goal 1. Ensure that populations of all wildlife in New York are of the appropriate size to meet all the demands placed on them.

Goal 2. Ensure that we meet the public desire for: information about wildlife and its conservation, use, and enjoyment; understanding the relationships among wildlife, humans, and the environment; and clearly listening to what the public tells us.

Goal 3. Ensure that we provide sustainable uses of New York's wildlife for an informed public.

Goal 4. Minimize the damage and nuisance caused by wildlife and wildlife uses.

Goal 5. Foster and maintain an organization that efficiently achieves our goals.

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Introduction

Photo courtesy of the Adirondack Ecological Center of SUNY ESF

The white-tailed deer (*Odocoileus virginianus*) is New York's most popular game animal and is found throughout the state. Residents and visitors to the state derive countless hours of enjoyment from the white-tailed deer resource. While interests vary, a healthy deer herd provides opportunities to enrich our lives and our appreciation for the natural world. As large herbivores, deer also play a role in shaping the landscape and can compete with human interests. Abundant deer populations can negatively affect plant communities and the other wildlife dependent on those communities. Deer can also cause problems for farmers, tree growers and homeowners and are a frequent hazard for motorists. Management of deer in New York seeks to maximize the benefits of this important resource while being mindful of the human and ecological concerns associated with abundant deer populations.

The purpose of New York's Deer Management Plan is two-fold. The first is to outline the components of New York's deer management program in a single document. Public review, comment and acceptance are critical components to effective deer management in the public interest. The second purpose of this plan is to provide strategic direction for deer management in New York over the next five years. Using a five-year timeframe allows for periodic evaluation by deer managers and the public and subsequent improvement on a relatively frequent basis.

This plan describes six primary goals identified by DEC that encompass the current priorities for deer management and the values and issues expressed by the public: 1) manage deer populations at levels that are appropriate for human and ecological concerns; 2) promote and enhance deer hunting as an important recreational activity, tradition and management tool in New York; 3) reduce the negative impacts caused by deer; 4) foster understanding and communication about deer ecology, management, economic aspects and recreational opportunities while enhancing DEC's understanding of the public's interest; 5) manage deer to promote healthy and sustainable forests and enhance habitat conservation efforts to benefit deer and other species; and 6) ensure that the necessary resources are available to support the proper management of white-tailed deer in New York. DEC seeks to achieve these goals through implementation of sound scientific management principles in a manner that is responsive to the complex ecological, cultural, recreational, and economic dynamics associated with deer in New York.

This plan calls for continued review and modification of management practices as needed to improve program efficiency and effectiveness. Successful implementation of many aspects of this plan will require greater levels of cooperation and partnership between the DEC and other organizations and agencies and a sustained commitment to support deer management efforts in New York.

Further, deer populations and deer management are influenced by long-term cultural and ecological changes (e.g., declines in hunter numbers, changes in land use and human development, and climate change). DEC's ability to understand, predict, and respond to these influences will be foundational to maintain effective deer management in the future. This plan identifies the need for long-term planning and research but also suggests immediate options to make hunters more effective, to reduce human-deer conflicts, and to initiate a stronger connection between deer population objectives and deer impacts on their habitat.

By focusing on the goals of this plan, DEC strives to provide a deer management program that balances the diverse interests and values of the public with the biological needs and ecological relationships of deer, for the benefit of New York's white-tailed deer herd and the people of New York.

Legal Mandate

The basis for New York's deer management program is established in the New York State Environmental Conservation Law (ECL) which spells out specific policy, authority and responsibility related to the deer resource. Excerpts of selected law include:

Section 11-0105

> *The State of New York owns all fish, game, wildlife, shellfish, crustacean and protected insects in the state, except those legally acquired and held in private ownership.*

Section 11-0303

> *The general purpose of powers affecting fish and wildlife, granted to the department by the Fish and Wildlife Law, is to vest in the department, to the extent of the powers so granted, the efficient management of the fish and wildlife resources of the state. Such resources shall be deemed to include all animal and vegetable life and the soil, water and atmospheric environment thereof, owned by the state or of which it may obtain management, to the extent that they constitute the habitat of fish and wildlife as defined in section 11-0103. Such management shall be deemed to include both the maintenance and improvement of such resources as natural resources and the development and administration of measures for making them accessible to the people of the state.*
>
> *To such extent as it shall deem feasible without prejudice to other functions in the management of fish and wildlife resources of the state and the execution of other duties imposed by law, the department is directed, in the exercise of the powers conferred upon it, to develop and carry out programs and procedures which will in its judgment, (a) promote natural propagation and maintenance of desirable species in ecological balance, and (b) lead to the observance of sound management practices for such propagation and maintenance on lands and waters of the state, whether owned by the state or by a public corporation of the state or held in private ownership, having regard to (1) ecological factors, including the need for restoration and improvement of natural habitat and the importance of ecological balance in maintaining natural resources; (2) the compatibility of production and harvesting of fish and wildlife crops with other necessary or desirable*

land uses; (3) the importance of fish and wildlife resources for recreational purposes; (4) requirements for public safety; and (5) the need for adequate protection of private premises and of the persons and property of occupants thereof against abuse of privileges of access to such premises for hunting, fishing or trapping.

Planning Process

This plan was developed through a process that included substantial involvement of affected stakeholder groups and the public, as well as internal review of existing deer management procedures. The process included the following components:

1. **Deer management scoping**

   In February 2009, DEC recognized the need to address several existing and growing challenges to deer management in New York and the value of establishing a multi-year plan to guide and focus management efforts. DEC began identifying key areas of concern and opportunities for program modification. Management concerns emphasized:

   a. the need for greater flexibility in antlerless harvest in areas with very low deer populations and in areas with abundant deer populations including highly developed environments;

   b. improving data utility by focusing on larger, ecologically similar areas for management;

   c. incorporation of forest condition data directly into objective setting and deer harvest management; and

   d. responding to long-term declines in hunter numbers.

   DEC also recognized several key issues that were circulating among the hunting community (e.g., structure of hunting seasons, buck harvest management, hunter access limitations, use of crossbows). DEC developed a process to identify public priorities for deer management in New York in preparation for development of a formal New York State Deer Management Plan.

2. **Preliminary solicitation of input from New York organizations affected by deer**

   During the summer of 2009, DEC contacted various organizations whose members are affected by deer and deer management and requested their comment on the deer management issues that are most important to their members. A summary of the input received is available at www.dec.ny.gov/docs/wildlife_pdf/deerideas09.pdf

3. **Public Meetings on Deer Management**

   Through the fall and early winter of 2009, DEC hosted 20 meetings across New York State in effort to more fully engage the public in refining the priorities for the future of deer management in New York. Over 1,000 people attended the meetings, and public input was collected at the meetings, by mail and via electronic forms that were available on the DEC website. The slide show and materials presented at the meetings, as well as a summary of the public input received, are available at www.dec.ny.gov/animals/57795.html

4. **Statewide Deer Hunter Survey**

   In reviewing the input received during the public meeting process, the public's priority issues for deer management were readily discerned. However, the public's perspective on several of the priority issues and the actions recommended to address the issues were frequently contradictory. Thus, DEC worked with the Human Dimensions Research Unit at Cornell University to conduct a formal survey of New York hunters and assess hunter preferences for potential management strategies related to hunting with a crossbow, altering buck and doe harvest management, and modifying deer hunting season structures. The survey was designed to elicit hunter opinions about potential regulation changes in light of possible trade-offs and effects associated with each potential change. The final report, *Statewide Deer Hunter Survey – 2010* (Enck et al. 2011), is available at www.dec.ny.gov/docs/wildlife_pdf/hdrudeer10.pdf.

5. **Plan writing**

   DEC reviewed public input and survey results in conjunction with current deer management priorities to establish the goals, objectives and strategies laid forth in this plan.

6. **Public review and comment**

   Following a period of public review and comment on the deer management plan, DEC will assess the comments and adjust the plan as necessary and appropriate.

History/Background

When European settlers arrived in New York, white-tailed deer were apparently present throughout the state but densities varied greatly by region. Relatively high densities of deer lived in open areas maintained by Native Americans primarily through periodic burning. However, the majority of New York was covered in mature forest, suitable only for relatively low densities of deer. Throughout the state, deer were an important source of meat, bone and hide for both Native Americans and settlers. As forests were cleared for agriculture, habitat conditions improved for deer, and their populations initially increased. Though periodic laws were enacted to afford some protection to deer (the earliest occurring in 1705), by the mid-1800s, excessive deer harvest by settlers and extensive habitat loss to agriculture caused deer populations to decline dramatically. By the 1880s, less than 25% of New York State was forested, and deer were absent in most of New York except the central Adirondack Mountains (Severinghaus and Brown 1956).

Photo courtesy of the New York State Archives

Following extirpation of deer from most of the state, the Legislature formed the New York State Fisheries, Game and Forest Commission in 1895, and deer populations received better protection, predominantly by closed seasons and very limited antlerless harvest. Deer recolonized New York via migration from remnant populations in the Adirondacks, Vermont, Massachusetts, Pennsylvania and a small herd relocated from the Adirondacks to the southern Catskills (Figure 1). The deer population increased in distribution and density through the 20th Century, re-inhabiting all areas of the state and reaching a population peak, estimated at over 1 million deer, between 2000 and 2002.

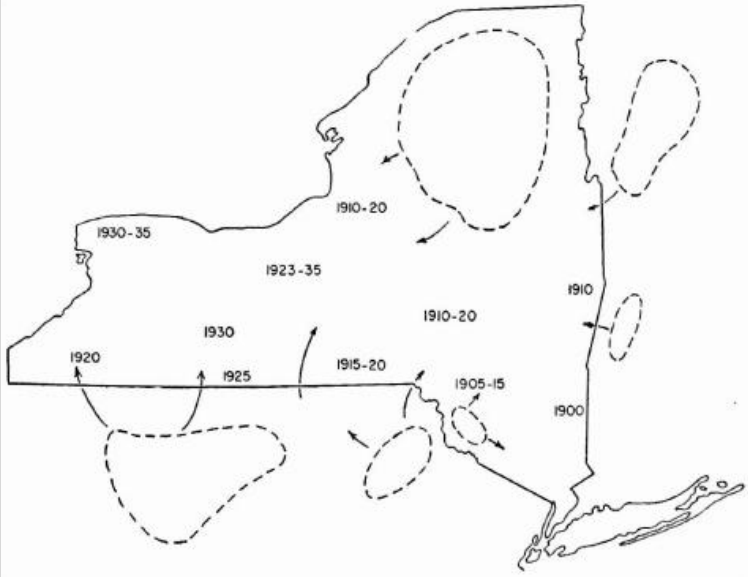

Figure 1. Major centers of deer population 1890-1900 in New York and vicinity from which deer spread throughout the State. Dates represent approximate time deer appeared in various parts of New York (Severinghaus and Brown 1956).

As deer populations grew in number and distribution, hunting seasons resumed incrementally until nearly all of the state was open to deer hunting. Increased abandonment of farms on marginal lands led to more early successional and young forest cover and better deer habitat throughout the state. By the 1940s, locally abundant deer populations resulted in increased levels of agricultural damage and overbrowsing of winter range in some locations. Short either-sex or doe-only seasons were used periodically to stem population growth (Figure 2). In the 1960s, through establishment of the Party Permit system (i.e., one antlerless tag per group of hunters), antlerless harvest became routine in some areas. Party Permits later transitioned into Deer Management Permits which are issued to individual hunters for use in specific Wildlife Management Units. These permits allow deer managers to accurately distribute the necessary antlerless harvest throughout the state.

Concurrent with deer population changes over the past century, the number of participating deer hunters has also fluctuated, reaching a peak in the mid-1980s. Reflective of nationwide trends, hunter numbers in New York then began to decline at a rate of roughly 2% per year (Figure 3). The decline in hunters is understood to be driven by

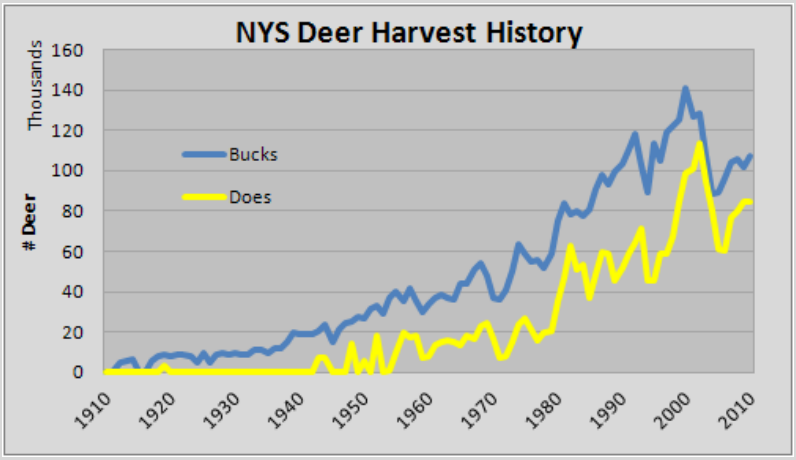

Figure 2. Legal adult (1.5 years and older) deer harvest in NY State, 1910-2010. Annual buck take provides a reasonable index to deer population trends.

changing demographic factors of society, principally increasing urbanization (Responsive Management/National Shooting Sports Foundation 2008). These trends present unique challenges for the future of deer management.

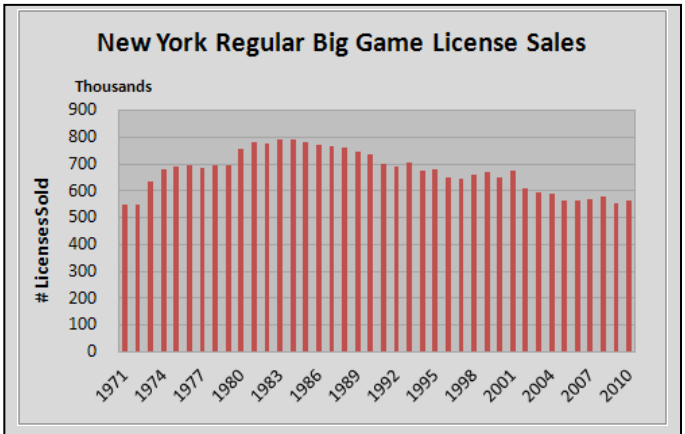

Figure 3. Regular Big Game license sales (resident and non-resident licenses) in New York State, 1971 - 2010. License sales figures provide a good but not exact reflection of deer hunter numbers.

Goal 1: Population Management

Manage deer populations at levels that are appropriate for human and ecological concerns.

The white-tailed deer is the most popular game animal in the state, providing many hours of recreation (e.g., observation, photography, and hunting) and nearly 11 million pounds of high quality meat to New Yorkers each year. Through these sustainable uses of the deer resource, hundreds of millions of dollars are generated annually for the state's economy (see sidebar on page 12). Conversely, the potential for deer populations to exceed carrying capacity, impact other plant and animal species, conflict with land-use practices, and affect human health and safety necessitate efficient and effective herd management.

Accordingly, DEC's legal mandate for deer management reflects the diverse interests affected by deer and directs DEC to manage deer with consideration of ecological impacts, human land uses, recreation and public safety. Balancing the deer population with the often conflicting demands of the various stakeholders impacted by deer has been and continues to be a fundamental challenge for deer managers. Since the early 1990s, DEC has used Citizen Task Forces (CTFs) to engage stakeholders in dialogue about the deer-related impacts experienced in their area and to generate recommendations for change in the local deer population. CTFs have been a valuable and functional tool to involve New Yorkers in deer management but may require periodic modification to adequately capture input from the appropriate stakeholders. For example, deer can have enormous impacts to the regeneration of desirable

Photo courtesy of Art Jacobson

tree species, and these impacts have not always been considered consistently during past CTFs. Modification of the CTF process and/or using other sources of input are needed to adequately capture the impact to this ecological stake and ensure appropriate representation among all stakeholder groups when developing management recommendations.

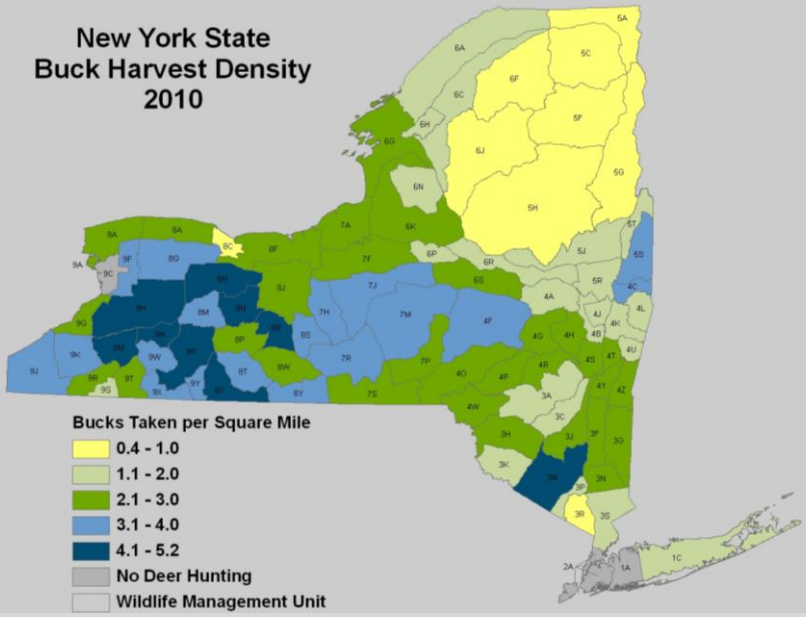

Figure 4. Harvest density of adult bucks (1.5+ years old) by Wildlife Management Unit in 2010, illustrating variation in relative population density across New York State.

Successful deer population management requires assessing public desires, ecological impacts (see Goal 5, Deer Habitat) and population trends. Then goals and management activities can be identified, implemented, and evaluated. Though estimates of deer population abundance and density are frequently sought by the public, meaningful estimates are difficult and expensive to acquire for free-ranging deer populations. Moreover, population estimates may not provide essential information for management. Rather, deer managers use indices to monitor trends in population size, condition and impact on the environment. Together these factors are more valuable than precise knowledge of the number of deer. In New York, DEC uses the annual buck harvest, expressed as bucks taken per square mile (Figure 4), and deer sighting rates by bowhunters (Figure 5) as indices to monitor changes in deer population size. However, as patterns in access to land for deer hunting become less uniform and hunters become more selective by choosing not to take young, small-antlered bucks, annual buck harvest density may become a less sensitive index of population change. To compensate, DEC will explore mechanisms to enhance current indices and integrate alternative methods to monitor population trends.

The New York landscape encompasses a diverse array of land uses, human population densities, forest types, soil characteristics, climate conditions, and other factors that affect habitat quality and quantity and influence deer population dynamics. Consequently, population density, survival and productivity, and developmental characteristics of deer are very different throughout the State. Deer management in New York has historically been implemented at the Wildlife Management Unit (WMU)

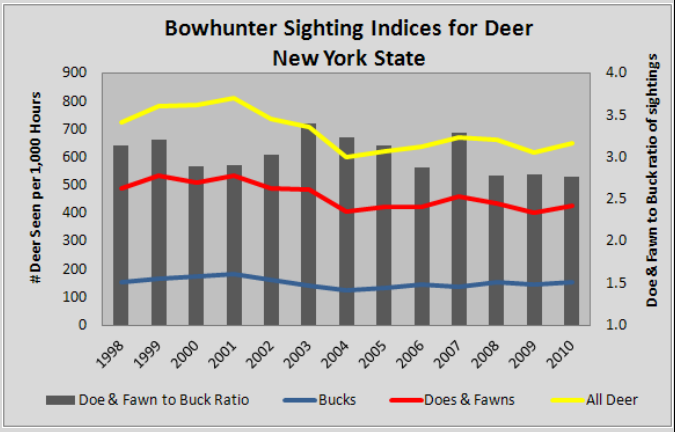

Figure 5. Trends in bowhunter sighting indices and the ratio of antlerless to antlered deer sightings in New York, 1998 - 2010.

level. Current WMUs range in size from 92 to 3,047 square miles but average only 530 square miles. At this relatively small scale, data sufficient for confident deer population analysis and management have proven difficult to obtain. Deer management decisions and efforts may be more appropriately based on aggregates of ecologically similar WMUs.

Deer populations are managed principally through manipulation of mortality rates of adult female deer. On the landscape scale, regulated hunting is the only viable tool available to accomplish this management. Through most of New York, DEC modifies the number of Deer Management Permits (i.e., antlerless deer tags) available to hunters and regulations for hunting during special bow and muzzleloader seasons to manipulate harvest of adult female deer and affect population change consistent with recommendations of local CTFs. In much of northern New York, deer populations are low and mainly controlled by mortality associated with severe winter conditions. In these areas, DEC currently lacks statutory authority to issue DMPs. Therefore, antlerless harvest is periodically adjusted through changes in season length and harvest regulations of muzzleloader hunting seasons.

While this system works well most of the time, fluctuations in bow and muzzleloading participation can substantially affect antlerless harvest. Additionally, when deer populations are low and few DMPs are available, hunter activity and antlerless harvest tends to shift toward the bow and muzzleloader seasons. As a result, DEC must further restrict DMP issuance to compensate for increased take by bow and muzzleloader hunters. This scenario can reduce DEC's ability to stimulate deer population growth. It also creates disparity of opportunity for regular season hunters, since all bow and muzzleloader hunters are provided an antlerless-only or either-sex tag while regular season hunters are limited to DMPs issued by lottery. Optimally, all antlerless harvest statewide would occur through use of DMPs.

Photo courtesy of Dave Spier

Value of White-tailed Deer in New York

Deer Viewing Facts [a]

539,000 residents and 157,000 non-residents routinely travel in New York to view deer

1,182,000 New Yorkers enjoy viewing deer near their home

Deer Hunting Facts [b, c, d]

- 566,690 deer hunters in New York
- 18.8 mean days per deer hunter
- > 10,800,000 pounds of venison
- > 5,500 jobs
- $410.9 million in retail sales
- $221.4 million in salaries & wages
- $61.3 million in state & local taxes
- $ 56.7 million in federal taxes

Sources:

[a] U.S. Dept. of Interior 2008
[b] NYSDEC license sales
[c] Enck and Brown 2008
[d] Southwick Associates 2007

In addition to population management, DEC has the responsibility for preventing the introduction or spread of any disease that endangers the health and welfare of wild white-tailed deer in New York State. Specifically, New York State Environmental Conservation Law section 11-0325 authorizes DEC to adopt control measures or regulations necessary to eliminate, reduce, or confine disease. Effective management of any wildlife disease requires an understanding of avenues of disease transmission and associated risk factors. Partnerships with the New York State Department of Agriculture and Markets,

Department of Health, and the United States Department of Agriculture are essential for comprehensive disease prevention, surveillance and mitigation.

Objective 1.1. Assess and monitor deer population size and condition using best available techniques.

Strategy 1.1.1: Develop WMU Aggregates based on similar ecological features, human population density and land uses, and deer harvest history for use in deer population monitoring, harvest analysis and management decisions.

Strategy 1.1.2: Use hunter harvest reports and field check of harvested deer to estimate the annual legal deer harvest to < ±5% with 95% confidence in each WMU Aggregate.

Strategy 1.1.3: Annually collect sex, age, antler measurements, and other biological data as needed to monitor trends in deer condition and population dynamics by WMU Aggregate.

Strategy 1.1.4: Develop and incorporate additional data collection techniques and indices to assist with population monitoring such as an assessment of hunter effort through post-season surveys, use of motion-triggered camera surveys, or other field surveys conducted by staff or volunteers.

Strategy 1.1.5: Maintain adequate participation in the Bowhunter Sighting Log program to provide trends of deer sighting rates for monitoring deer population trends within each WMU Aggregate.

Strategy 1.1.6: Evaluate options to enhance data input into the winter severity index.

Objective 1.2. Set and evaluate population objectives within each WMU Aggregate that are based on recommendations of the public and are consistent with assessments of deer impact on ecosystems.

Strategy 1.2.1: Investigate alternative mechanisms to obtain input from stakeholders on desired changes to deer populations or modifications of the CTF process that increase efficiency and save time and money.

Strategy 1.2.2: Use input from local stakeholders and a deer-forest impact index (Habitat Goal, Objective 1) within WMU aggregates relative to population indices to guide annual issuance of Deer Management Permits and other methods for regulating the harvest of antlerless deer and altering deer population size.

Objective 1.3. Adjust harvest of antlerless deer to achieve desired deer population levels**.**

Strategy 1.3.1: Set target allocations of Deer Management Permits (antlerless permits) each year and/or periodically modify special seasons to achieve the desired deer population size in each WMU aggregate via deer hunting.

Strategy 1.3.2: Initiate a process to discontinue use of either-sex and antlerless-only bow and muzzleloader tags for antlerless harvest and transition to a system based on Deer Management Permits in all areas of the state (Appendix 5).

Objective 1.4. Conduct scientific research to support deer management.

Strategy 1.4.1: Establish contracts or Memorandums of Understanding or both with universities and non-governmental organizations and develop DEC projects for the scientific study of deer ecology and population dynamics; hunter demographics, attitudes and behaviors; public interests in deer management; impacts of potential regulation changes; and deer impacts to native vegetation and forest ecosystems.

Strategy 1.4.2: Recognize and evaluate non-hunting sources of deer mortality (e.g., deer-vehicle collisions, predation) and their impacts on deer populations. If these affect deer management, identify ways to quantify and address them.

Objective 1.5. Monitor wild deer for disease incidence and prevalence and manage deer populations to reduce the potential for non-endemic disease introduction and spread.

Strategy 1.5.1: Understand deer related diseases that may threaten deer populations, livestock industry, or human health. Maintain a response approach to minimize those threats and prevent establishment of non-endemic disease in New York.

Strategy 1.5.2: Sample New York's wild deer herd for disease and investigate unique incidences of deer exhibiting clinical symptoms.

Strategy 1.5.3: Work with New York State Department of Agriculture and Markets and appropriate stakeholders to promote and enforce disease free importation, confinement, and husbandry of captive Cervids, and to define acceptable decommissioning procedures that do not threaten New York's wild deer or ecology.

Strategy 1.5.4: Work with stakeholders in the wildlife rehabilitation community to assess current rehabilitation practices for deer and take appropriate measures to ensure that such practices are effective, ensure public safety and do not pose a threat to the wild deer population.

Strategy 1.5.5: Conduct a risk-assessment of disease introduction and spread due to hunting related practices (e.g., taxidermy and use of deer urine-based products as attractants), and promote regulations or legislative initiatives as needed to limit disease risk.

Strategy 1.5.6: Conduct a broad assessment of the captive Cervid industry as it relates to disease risk, privatization of wildlife, and New York's hunting culture.

Strategy 1.5.7: Prevent Chronic Wasting Disease (CWD) from being established in New York, and contribute to the national CWD surveillance effort.

Strategy 1.5.8: Maintain and enforce the prohibition on the feeding of wild white-tailed deer (6 NYCRR 189).

Goal 2: Hunting and Recreation

Promote and enhance deer hunting as an important tradition and management tool in New York.

Deer hunting is a long-standing tradition in New York and is an important part of many New Yorker's outdoor heritage. Deer hunting was essential for survival of Native American groups in New York and played an integral role in sustaining early European settlements. Today, deer hunting continues to be an important activity for many New York families, providing a valuable source of food, a means of shared recreation and an opportunity to pass-on family traditions and reverence for nature. Additionally, deer harvest through regulated hunting remains the most effective and equitable tool for managing deer populations across the state.

Photo courtesy of Gina Dermody

These cultural, social, and management values of hunting are reinforced in the North American Model of Wildlife Conservation (Geist et al. 2001), a series of principles that underpin deer and wildlife management in New York and throughout North America. At the heart of the model is the concept of wildlife as a public resource, owned by no one but held in trust by the government for the benefit of the people. Further, access to wildlife by hunters is provided equally to all, regulated by law or rule-making with public involvement rather than market pressures, wealth, social status or landownership. Management policy and decisions are rooted in science and support an ethic of fair-chase and legitimate use (e.g., fur and food) of harvested wildlife. Adherence to these tenets has allowed game management to function successfully while retaining strong support among the generally non-hunting public. For this reason the principles of New York's deer management program are based upon the North American Model of Wildlife Management.

Indeed, a strong majority (78%) of Americans support legal hunting while only 16% disapprove (Responsive Management 2008). Yet, public opinion varies when motivation for hunting is considered. Public support is strong when hunting is conducted for food, to protect humans and for population management, though support decreases sharply for hunting perceived as conducted simply for recreational purposes, for the challenge, or for a trophy. Additionally, public perceptions of hunter behavior and safety greatly influence acceptance and support for hunting as an activity (Responsive Management 2008). Though most perceived problems are not directly associated with legal or ethical hunting, even among hunters, poor behavior of other hunters (e.g., illegal activity, perceived unsafe or unethical practices) is a leading cause of dissatisfaction with their deer hunting experience (Enck and Decker 1991). Therefore, it is important that New York's deer management program continue to reflect the primary values associated with public acceptance of hunting, and DEC must continue to promote

Photo courtesy of Dick Thomas

safe and ethical hunting practices through education programs to new and seasoned hunters, as well as inform the public about the strong safety records of New York's hunters. DEC is dedicated to ensuring that the tradition of hunting remains strong in New York and that deer management continues to reflect tenets of the North American Model and principles of fair chase, despite changing cultural values and pressures from within and without the hunting community.

In rural New York, the concept and practice of deer hunting is well ingrained. Yet, as people continue to settle in more urban environments, they tend to seek other pastimes, becoming further removed from the natural environment and less familiar with the values and validity of hunting. Further, the majority of New York hunters hail from rural areas (Lauber and Brown 2000, Enck et al. 2011). Thus, as the proportion of New York's population living in rural areas decreases, the proportion of New York's population that is likely to hunt also decreases. This societal change has resulted in a long-term decline (nearly 40%) in deer hunting participation in New York since the mid-1980s. The average age of hunters is getting older and recruitment of new hunters is insufficient to fully replace older hunters who drop out through attrition. Thus, for deer management to continue effectively in the future, DEC must consider management options that engage new hunters while also improving efficiency and retention of existing hunters.

Concurrent with declining numbers of hunters, access to huntable land has also decreased in New York. In 1991, over 60% of all private lands in upstate New York were posted, and rates of posting had increased 13% during the previous decade (Siemer and Brown 1993). While many people who posted their properties still allowed hunting, most lands were reserved for exclusive use by relatively few people, and at that time, an estimated 25% of private lands were essentially closed to hunting. The trend in posting and closure of private lands to hunting has very likely continued over the past 20 years, and this has strong implications for hunter activity and deer management efficacy. Lack of access to hunting land decreases hunter's enjoyment and may cause them to hunt less often (Responsive Management 2010). Perhaps more troubling, lands closed to hunting or that receive only nominal hunting pressure can function as refuge areas for deer, thereby compromising DEC's ability to manage deer numbers to levels desired by the public. Frequently this results in locally abundant deer populations that negatively impact forests, create problems for homeowners and motorists, and may decrease the value attributed to deer by the affected public.

Deer managers should be involved in efforts to enhance access, particularly as they may increase management effectiveness. However, substantial improvements to hunter access will require significant resource investment by DEC and cooperation of New York hunters and hunting organizations.

Opportunities exist to participate in federal programs (e.g., U.S. Department of Agriculture's Voluntary Public Access and Habitat Incentive Program), establish new cooperative hunting areas through the New York State Fish and Wildlife Management Act, expand conservation easements, acquire new public lands through strategic open space planning, or develop new incentive-based access programs. Efforts to inform landowners on the ecological value and social benefits associated with deer hunting, as well as the laws related to land posting and landowner liability, may convince additional property owners to allow deer hunting on their lands.

Given the strong traditions associated with hunting and the importance of working with hunters to maintain a successful deer management program, DEC greatly values hunters' ideas and preferences when considering changes that affect deer hunting. Through the public input process that preceded development of this plan, hunters expressed strong interest in potential modifications of hunting season lengths and timing, use of crossbows, youth opportunities, and alternative strategies for buck and doe harvest management. However, actual preferences of hunters varied widely for most issues. By presenting hunters with structured options in the context of associated trade-offs in a formal survey (Enck et al. 2011), DEC was able to assess preferences and opinions more completely. As a result, this management plan identifies several strategies (e.g., special opportunity for youth hunters, expansion of bowhunting opportunities, greater flexibility with antlerless harvest management, and promotion of methods to reduce harvest of young bucks [see Appendix 2: Proposed Deer Hunting Season Structure and Appendix 3: Alternative Buck Harvest Strategies]) that are compatible with deer management and are consistent with hunter interests.

Finally, DEC also recognizes that deer management decisions and changes to deer hunting affect non-hunting wildlife enthusiasts and hunters of other game species. Deer management decisions, therefore, must continue to incorporate the interests and perspectives of these groups.

Objective 2.1. Promote recreational hunting, among all New Yorkers, as a safe, enjoyable and ethical activity and as the primary tool to manage deer populations.

Strategy 2.1.1: Emphasize recreational hunting as the first choice and most cost-effective option for controlling deer populations.

Strategy 2.1.2: Provide the public with ample opportunity to harvest white-tailed deer for food and other utilitarian purposes.

Strategy 2.1.3: Encourage participation in the Venison Donation Program and similar programs as a mechanism to encourage deer harvest and foster local use of the deer resource.

Strategy 2.1.4: Contribute to DEC efforts to engage new hunters by improving safety education courses and implementing additional education programs as needed to encourage hunter safety, equity and ethical behavior.

Strategy 2.1.5: Ensure that any new deer hunting regulations or modifications of existing regulations promote safe, equitable, and ethical hunter behavior. Evaluate legislative options and policies using the same criteria.

Objective 2.2. Establish deer hunting seasons, regulations, and programs that are effective for deer population management and that encourage hunter participation, recruitment, retention and satisfaction.

Strategy 2.2.1: Incorporate a firearms deer hunting opportunity for youth (ages 12-15*) on Columbus Day Weekend in all portions of New York where hunting deer with firearms is allowed.

*Current statute limits deer hunting with a firearm to youth aged 14 and older. DEC supports a uniform minimum hunter age of 12 years for all hunters (Appendix 5).

Strategy 2.2.2: Begin the Southern Zone bowhunting season and the regular season in Westchester County on October 1 each year; allow bowhunting during the late muzzleloading season in the Northern Zone in areas where the late season is open; and set the Northern Zone regular season to run for 44 days beginning the 4th Saturday in October.

Strategy 2.2.3: Limit the bowhunting and muzzleloading seasons in the Southern Zone to antlered deer-only in units where no DMPs will be offered for antlerless harvest.

Strategy 2.2.4: Allow DMPs to be used during bowhunting season and early muzzleloader season in the Northern Zone.

Strategy 2.2.5: Make Bonus DMPs valid for antlerless deer only. Modify the process of issuance to increase efficiency and facilitate expanded use of Bonus DMPs in areas where conventional issuance of DMPs is insufficient.

Strategy 2.2.6: Where deer populations are above desired levels and DMP quotas exceed applicant base, initiate a progressive and adaptive approach to increase antlerless harvest by: 1) expanding the use of Bonus DMPs; 2) making a portion of the early bowhunting season and late muzzleloading season valid only for antlerless deer; and 3) implementing an early muzzleloader season for antlerless deer in these areas.

Strategy 2.2.7: Assist in broader DEC efforts that encourage hunter recruitment and retention, including review and monitoring of other state and federal programs for potential implementation in New York.

Objective 2.3: Promote efforts to reduce harvest of young (≤1.5 years old) bucks.

Strategy 2.3.1: Educate hunters on their role in affecting local deer populations and herd composition. Encourage those hunters who desire to see and take more 2.5 year old and older bucks to voluntarily restrain from harvesting young, small-antlered bucks.

Strategy 2.3.2: Provide reports and maps illustrating the geographic variation in characteristics of harvested bucks (e.g., harvest by age class, antler point distribution by age class) to guide

hunters in making harvest decisions that are appropriate for their hunting area and congruent with their goals.

Strategy 2.3.3: Promote landowner-hunter cooperatives for voluntary implementation of specialized deer management programs on private land.

Strategy 2.3.4: Develop a collaborative demonstration area(s) using both state and privately managed lands to illustrate application of Quality Deer Management techniques (Miller and Marchinton 1995).

Strategy 2.3.5: Continue mandatory antler restrictions in WMUs 3C, 3H, 3J, and 3K.

Strategy 2.3.6: Beginning in the 2012 big game hunting season, expand the mandatory antler restriction area to include WMUs 3A, 4G, 4O, 4P, 4R, 4S, and 4W.

Strategy 2.3.7: Develop objective criteria for considering mandatory antler restrictions in other portions of New York.

Objective 2.4. Improve hunter access to public and private lands.

Strategy 2.4.1: Expand the area open for deer hunting during the Special January Firearms Season in Suffolk County.

Strategy 2.4.2: Develop and maintain a current understanding of the impediments to private land access to deer hunting through periodic public surveys and solicitation of comments.

Strategy 2.4.3: Work with municipalities, State and local parks, and private preserves to allow or increase deer hunting on their lands.

Strategy 2.4.4: Improve online maps and descriptions of Wildlife Management Areas and other state lands.

Strategy 2.4.5: Work with Cornell Cooperative Extension to better inform landowners about posting laws and liability protection extended to landowners by the General Obligations Law.

Objective 2.5. Consider other forms of outdoor recreation associated with or affected by deer management.

Strategy 2.5.1: Review impacts to small game hunting, furbearer hunting and trapping when considering changes to deer hunting regulations, seasons or programs.

Strategy 2.5.2: Support non-consumptive recreational benefits (e.g., wildlife watching and photography) that deer provide to New York residents and visitors.

Goal 3: Conflict and Damage Management

Reduce the negative impacts caused by deer.

One of the principal philosophies guiding DEC is that the public shall not be caused to suffer inordinately from the damaging effects of, and conflicts arising from, resident wildlife. This philosophy has its roots in statute (see Legal Mandate), but it is also common sense and a practical necessity if New Yorkers are to co-exist with deer. DEC is committed to providing site-specific options for landowners to control deer damage on their property and fostering a climate of understanding, cooperation, and communication among and between those affected by deer.

Photo courtesy of Dick Thomas

While the negative impacts of deer pale in comparison to the species' positive attributes, when damage does occur, it can be sizable and significant. In 2002, New York farmers estimated their deer-related crop damage to value approximately $59 million, and about one quarter of farmers indicated deer damage was a significant contributing factor affecting the profits of their farm (Brown et al. 2004). Similarly, deer-vehicle collisions are a major source of deer-related damage in New York (Figure 6). This is a primary concern for motorists, particularly in suburban areas with abundant deer populations. Crop damage and deer-vehicle collisions are frequently prime factors taken into consideration when a Citizen Task Force is convened to recommend a deer population level for a WMU.

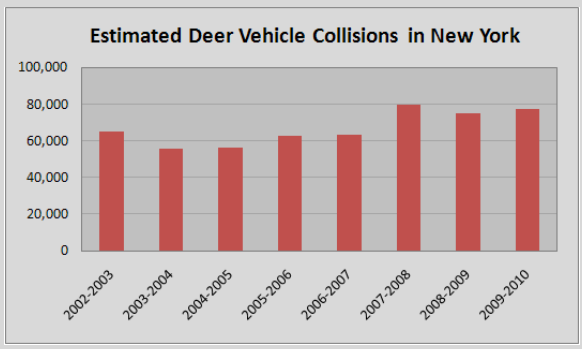

Figure 6. Estimated deer vehicle collisions in New York State, July 2002 through June 2010, based on reported claims to State Farm Insurance® and their share of the automobile insurance market in New York (data provided by State Farm Insurance®).

Each year, DEC responds to countless inquiries and complaints about nuisance and damaging deer, and often these contacts can be satisfied with advice alone. However, advice alone often will not work adequately to stem damage. In cases where population reduction is the best course of action, DEC's primary method of controlling overabundant deer continues to be the harvest of antlerless deer during the fall hunting seasons. This in-season hunting generally works best over large areas, or when damage is not severe. For more intensive, local site control during the hunting seasons, qualifying landowners can also receive Deer Management Assistance Program (DMAP) permits. DMAP addresses crop damage, forest regeneration problems, or provides custom or municipal deer management. When damage to crop lands is significant and takes place outside of normal hunting time

frames, Deer Damage Permits (DDPs) can be issued to reduce crop losses that are current and ongoing. DMAP and DDPs are designed for local effect, and impact of these permits on regional deer populations is minor compared to overall harvest of antlerless deer by hunters (Figure 7).

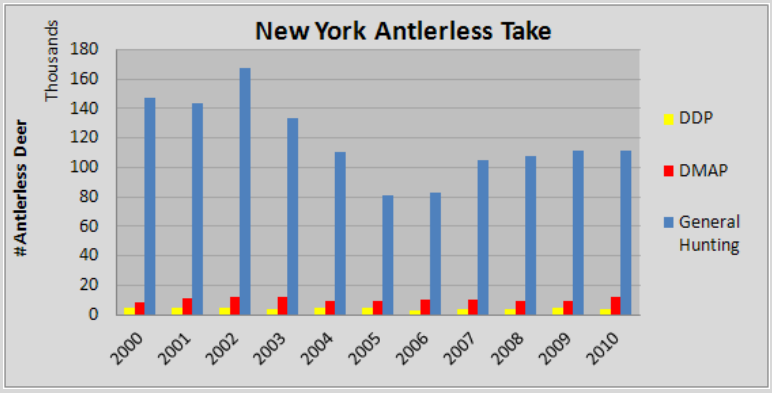

Figure 7. Trend in antlerless deer harvest through Deer Damage Permits (DDPs) and Deer Management Assistance Program (DMAP) permits and general hunting in New York State, 2000 – 2010.

Locally abundant deer populations in urban, suburban, or otherwise developed areas present unique management challenges. DEC is dedicated to increasing deer harvest in these areas to lessen impacts on residents. Since these are community-wide issues, DEC will assist landowners, land managers, organizations and municipalities in developing comprehensive approaches toward resolution.

New York's deer management program is structured with a tiered system of harvest management to provide meaningful scales of management intensity to meet varying stakeholder objectives (Figure 8).

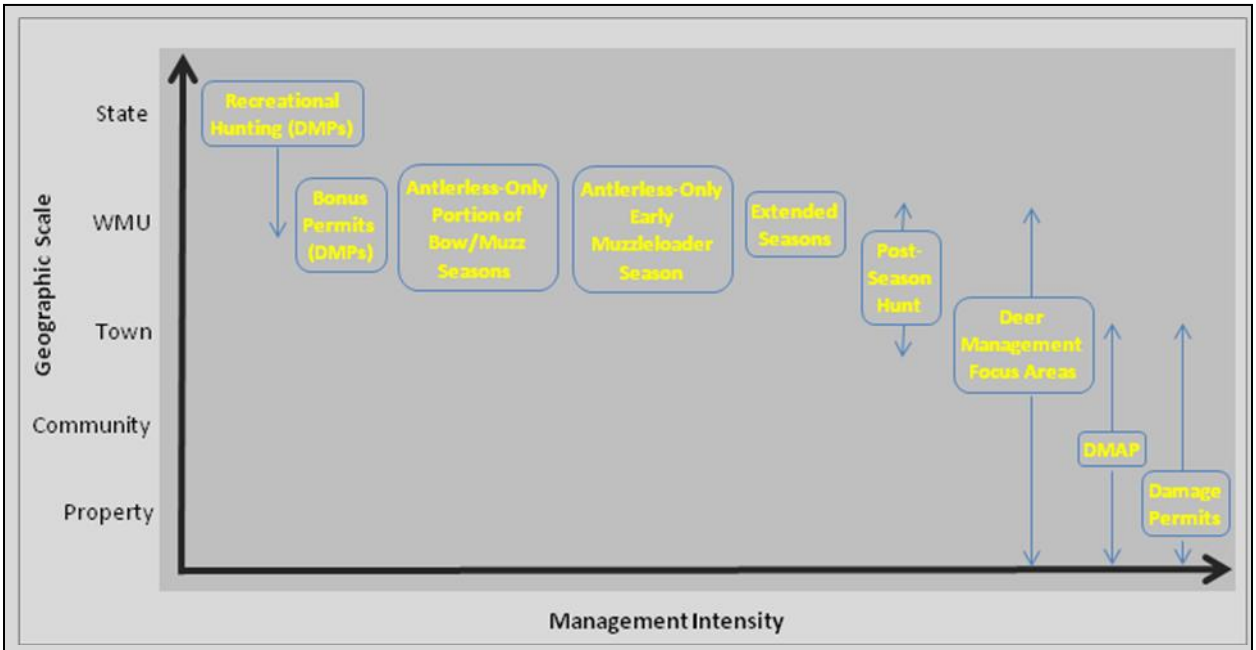

Figure 8. Conceptual framework of deer harvest management in New York across varying degrees of geographic scale and management intenstiy. Note that some programs have applicability at multiple geographic levels. Extended seasons (e.g., January firearms season in Suffolk County) are authorized for Westchester and Suffolk counties in ECL 11-0903(7). Post-season hunts are authorized in ECL 11-0903(9) for use in areas where firearms deer hunting is allowed. Deer Management Focus Areas are discussed in Objective 3.2.

Objective 3.1. Provide opportunities for landowners to achieve deer management objectives on lands they own or control.

Strategy 3.1.1: Continue to use and improve the Deer Management Assistance Program (DMAP) to provide additional antlerless deer tags to landowners, land managers and municipalities for site specific deer management by hunters.

Strategy 3.1.2: Work with DMAP permit recipients to evaluate program effectiveness for meeting their goals. Specifically, for DMAP permits that require a management plan (i.e., forest regeneration, municipalities, significant natural communities, and custom deer management) develop a standard form for submission of monitoring data (e.g., regeneration success, browse impact, deer weights, ages, or antler measurements) in addition to general harvest reports.

Strategy 3.1.3: Continue to offer and improve the Deer Damage Permit program to mitigate acute deer-related damage and increase public tolerance for deer on the landscape.

Strategy 3.1.4: Provide technical assistance on various lethal and non-lethal approaches to management of deer related damage to agriculture, forests and residential interests.

Strategy 3.1.5: Develop approaches to increase and enforce compliance of DMAP and damage permit recipients and to maintain general support for these programs.

Strategy 3.1.6: Maintain and update DEC's guidelines and procedures for handling deer damage complaints and issuing DMAP or Deer Damage Permits.

Objective 3.2. Increase deer harvest in areas with generally overabundant deer by establishing Deer Management Focus Areas by regulation with intensified use of traditional hunting.

Strategy 3.2.1: Designate geographic areas requiring intensive deer management that may include multiple landowners, multiple municipalities or multiple WMUs as Deer Management Focus Areas.

Strategy 3.2.2: Liberalize harvest of antlerless deer in Deer Management Focus Areas by expanding bag limits of antlerless deer, extending hunting seasons, and/or incorporating post-season hunts.

Objective 3.3. Promote community-based deer management to address locally abundant deer populations in areas where population management through traditional hunting is constrained, prohibited, or viewed as not feasible.

Strategy 3.3.1: Develop a guidance document to assist landowners, land managers, municipalities, or organizations in establishing controlled hunting programs.

Strategy 3.3.2: Maintain a current understanding of the potential management techniques (e.g., fertility control – See Appendix 4) that may be used in unique community-based applications where lethal deer management techniques cannot be effectively employed.

Strategy 3.3.3: Develop a model ordinance for the discharge of firearms that local municipalities may adopt to promote the safe and reasonable use of firearms while maintaining the flexibility needed to manage wildlife populations through hunting or culling.

Strategy 3.3.4: In highly developed, urban and suburban areas, such as Richmond County, work with elected officials, municipal agencies, community organizations, and local residents to understand community desires for local deer populations and to identify deer management strategies that are feasible and cost-effective for the community.

Goal 4: Education and Communication

Foster understanding and communication about deer ecology, management, economic aspects and recreational opportunities while enhancing our agency's understanding of the public's interest.

White-tailed deer are one of the most valued and recognizable wildlife species in New York. Because of their large size, easy identification, broad geographic distribution, and adaptability to suburban and urban landscapes, deer are a highly visible species across the state throughout most of the year. As a result, there is a high level of public interest in white-tailed deer life history, management, and associated opportunities for people to enjoy the myriad benefits that deer provide to New Yorkers.

Photo courtesy of Dave Spier

DEC routinely conducts education and outreach activities, though these efforts are insufficient to fully satisfy the public interest about deer. Moreover, as public familiarity and comfort with the natural world declines through increased urbanization, and as the public is further distanced from New York's hunting heritage, greater effort is needed to bolster an understanding of the importance and process of deer management in New York.

While developing an informed public is essential, DEC also prioritizes obtaining routine feedback from the public and engagement of New Yorkers in deer management decision making. Understanding public attitudes about deer and deer management is critical for maintaining an effective management program that is compatible with the needs, concerns, and expectations of the public.

Objective 4.1. Ensure stakeholder participation as deer management decisions are considered and outcomes are communicated.

Strategy 4.1.1: Conduct periodic surveys of the public and hunters to remain current on attitudes, beliefs and desires for deer populations and management.

Strategy 4.1.2: Inform the public about proposed regulations through publication in the *State Register*, on the DEC website, and in the *Environmental Notice Bulletin*.

Objective 4.2. Increase public awareness of deer biology, deer management, impacts associated with deer populations, and the safe and ethical practice of regulated hunting.

Strategy 4.2.1: Develop a communication calendar for the deer management program. Include activities and expected outcomes, routine press releases, management program updates, and public meetings as needed.

Strategy 4.2.2: Provide press releases, submissions to *Field Notes* and e-mail list notifications covering subjects related to deer management.

Strategy 4.2.3: Provide current and useful information on the DEC website in a way that is easy to navigate.

Strategy 4.2.4: Prepare a *Conservationist for Kids* issue specific to deer biology and management and the social and ecological benefits of hunting.

Strategy 4.2.5: Inform the public about the positive social, economic, and ecological impacts of deer hunting and the negative social, economic and ecological impacts of overabundant deer populations. Describe effective options to manage deer populations so the public can make informed decisions on the applicability of each technique.

Strategy 4.2.6: Partner with other organizations (e.g., Cornell Cooperative Extension, environmental and deer hunter groups) to share ideas and knowledge and conduct deer related educational outreach.

Strategy 4.2.7: Promote understanding and acceptance of the Deer Damage Permit program and the Deer Management Assistance Program through publication of reports describing program activities.

Goal 5: Deer Habitat

Manage deer to promote healthy and sustainable forests and enhance habitat conservation efforts to benefit deer and other species.

Deer are intricately connected to the habitat in which they live, relying on habitat resources for food, water, and cover. Yet as herbivores feeding on a wide variety of herbaceous and woody plants, deer are capable of dramatically altering the structure and composition of their forest habitat. Accordingly,

deer impacts on forest ecosystems are an important consideration for managing deer populations throughout New York.

Figure 9. Browse line on Stissing Mountain, Dutchess County, New York. Photo courtesy of Tom Rawinski.

The extent of deer impacts on forests reflects the relationship of deer abundance and forage availability, whereby as forage availability increases the impact of deer on forest resources decreases (Marquis et al. 1992). In areas with abundant food resources, deer impacts may be slight even at moderate to high densities. Yet in areas with limited food resources, even low density deer populations may negatively impact forest condition and have cascading effects on other wildlife species. By selectively feeding on the highest quality and most palatable forage available, excessive deer browsing can result in mortality or reduced growth of young plants and prohibit successful regeneration of preferred forage species. Highly preferred herbaceous and woody plants may be suppressed, and the forest may slowly transition toward less palatable and browse-tolerant vegetation (Horsley et al. 2003). This reduces the ability of a forest to replace itself and creates conditions that favor exotic and invasive species (Baiser et al. 2008). Areas heavily impacted by deer are typified by clear browse lines, lacking much of the understory vegetation up to the height deer can reach (Figures 9 and 10).

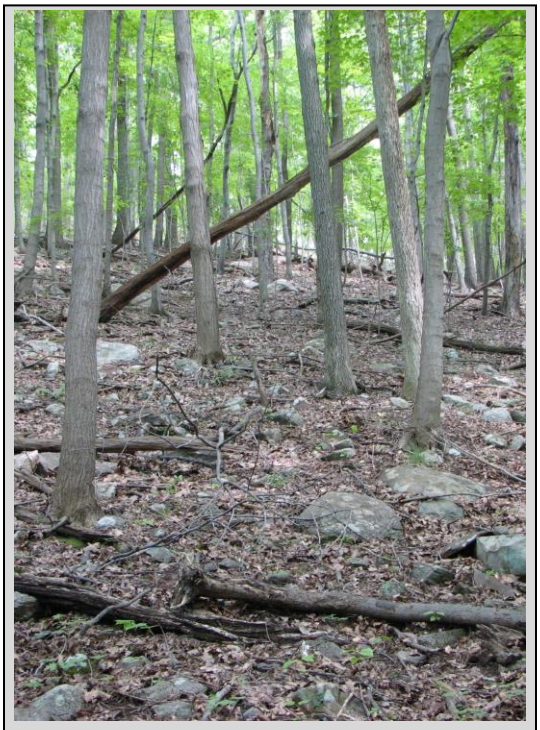

Figure 10. Deer damaged forest on Pochuck Mountain, Orange County, New York. Photo courtesy of Tom Rawinski.

Such changes to forest structure and composition not only reduce the value of the habitat for deer but can substantially reduce the habitat suitability for many other wildlife species resulting in local declines in biodiversity. Loss of understory vegetation from excessive deer browse has been linked to reduced diversity and abundance of forest-breeding birds (deCalesta 1994, McShea and Rappole 1994), and deer may affect trophic interactions between small mammals and birds, through direct competition for mast resources, particularly in years of low mast production (McShea 2000).

In New York, deer impacts on forest ecosystems are most apparent in areas where deer populations are unmanaged or hunting activity is severely constrained (e.g., parks and suburban greenspaces), but detrimental deer impacts are also evident across a range of deer densities and forest habitats. Foresters practicing in New York estimated that forest regeneration, in stands opened up for

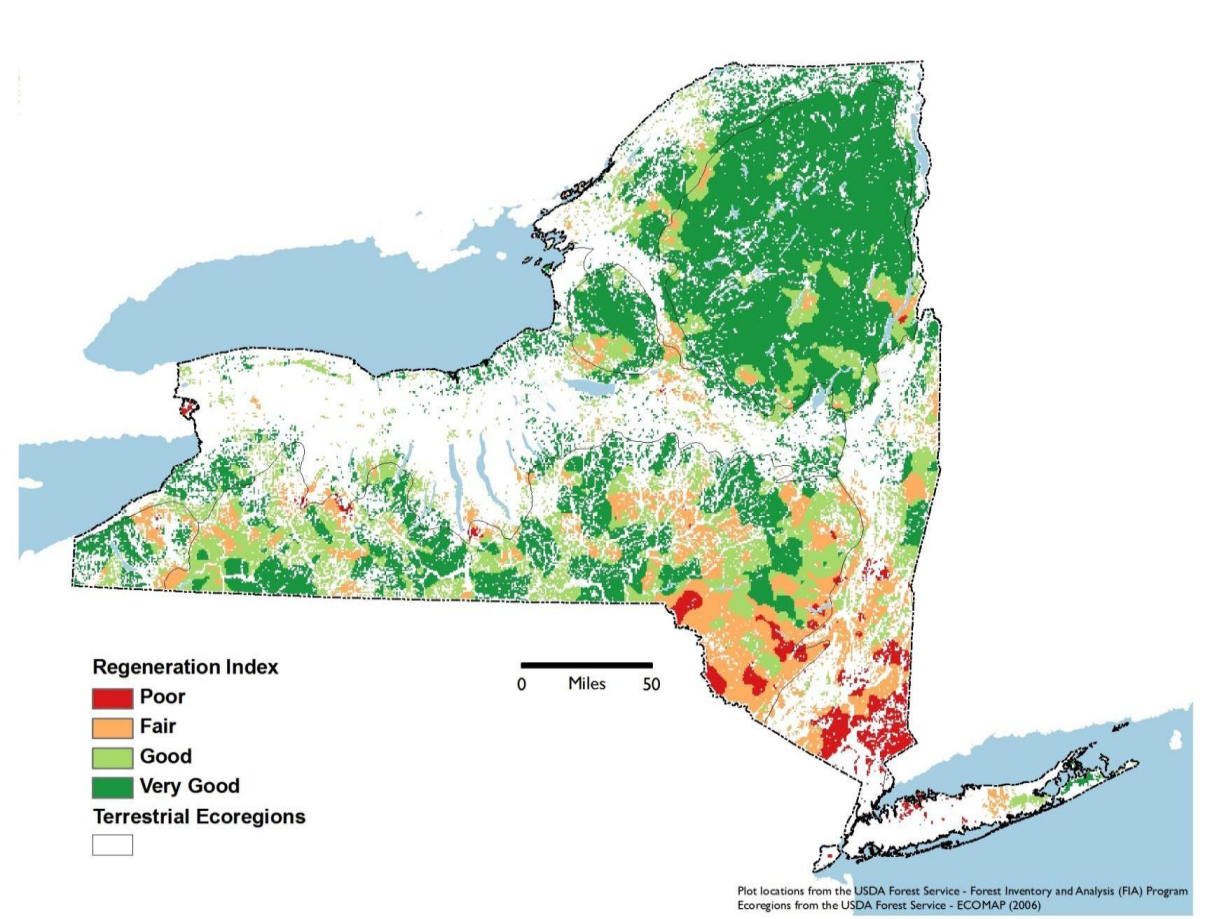

Figure 11. Predicted values for an index of forest regeneration of native canopy tree species in New York. Courtesy of the Eastern New York Chapter of the Nature Conservancy (Shirer and Zimmerman, 2010).

regeneration, was moderately or highly successful only 30% of the time. They identified deer browsing and interfering vegetation as the primary causes of the problem (Connelly et al. 2010). Lack of interest or unwillingness of landowners to implement timber stand improvement or other measures to control less desirable tree species was also cited as a contributing factor to poor regeneration success. Alternatively, an assessment of data from the USDA Forest Inventory and Analysis (FIA) program indicated regeneration was adequate in 68% of plots for canopy tree species and in 43% of plots for species with substantial timber value (Shirer and Zimmerman 2010). However, regeneration success varied geographically, with forests in southeastern New York generally fairing worse than other regions (Figure 11).

Deer abundance relative to impact levels will vary among forests depending on forest type, site quality, stand history, stand age, and landscape context (proximity of alternative food sources), thus no standard deer abundance objective can be established to maintain deer impacts below an acceptable threshold. Rather, assessment of deer impact (e.g., browse intensity or regeneration success) provides a meaningful metric for evaluating the appropriateness of an existing deer density relative to forest condition. Further, determination of an acceptable impact threshold will invariably involve trade-offs between desired levels of deer abundance and ideal forest composition.

DEC has a history of conducting routine assessments of browse impact in winter concentration areas (Doig 1968, Dickinson 1986) and using these data to inform recommendations for deer population change. These activities were primarily conducted in the heavily forested Adirondack and Catskill Regions in known deer yards, and uniform assessment of forest condition across New York was not achieved. Further, browse impact surveys in winter concentration areas waned as staffing and resources decreased over time. Thus, WMU Aggregate scale assessment of deer impacts on forests and integration of those data into the deer harvest quota setting process is a critical need for future deer management in New York. Currently, use of FIA data to calculate a forest regeneration index of canopy trees, similar to the work of Shirer and Zimmerman (2010), represents the most readily available method for assessing deer impact across the breadth of New York's landscape.

In addition to manipulating deer numbers to achieve acceptable levels of impact to forests, habitat improvement activities can increase the quality and resilience of the habitat for a given deer population, potentially even supporting greater numbers of deer without detrimental effect. Habitat improvements frequently involve maintaining a diversity of forest age classes including establishment of early successional forest and shrub habitat, promotion of nut and fruit producing trees and shrubs, and creating and maintaining woodland openings comprised of native grasses and forbs. Habitat improvement activities benefit deer and other wildlife and should be encouraged throughout New York. On state-owned lands, DEC conducts habitat improvements on a limited basis, primarily due to limited financial and staff resources. Further, approximately 63% of state-owned land is Forest Preserve, in which no cutting or manipulation is lawful. Consequently, as forests continue to age, much of state-owned land is deteriorating in quality as deer habitat.

However, more than 80% of New York's nearly 18.6 million acres of forest are held in private ownership. Private landowners, therefore, have great ability to affect the relationship between deer and forests by managing deer populations to benefit the forests and managing forests to benefit the deer. To that end, many existing state and federal programs provide direction and financial incentive to landowners who practice sustainable forestry, land conservation, and habitat improvements to benefit wildlife. DEC should promote greater awareness and participation in these programs as a means to improve private land value as deer habitat.

Objective 5.1. Maintain deer impacts on forested ecosystems at levels that support sustainable forest habitats.

Strategy 5.1.1: Evaluate the use of USDA Forest Inventory and Analysis data to classify the regeneration status of canopy-tree species within each WMU aggregate.

Strategy 5.1.2: Identify and incorporate an index of deer impact on forests into deer population objective setting and management decision making for each WMU aggregate.

Strategy 5.1.3: Develop a simple and effective protocol for conducting an inventory of deer impacts on state lands.

Objective 5.2. Increase habitat conservation and management on public and private land to benefit deer and other species.

Strategy 5.2.1: Promote landowner awareness of and participation in state and federal land conservation and forest stewardship programs that benefit deer.

Strategy 5.2.2: Stress the importance of habitat conservation with outreach efforts to various segments of the public including farmers, educators, hunters, forest landowners and managers, and community land planners.

Strategy 5.2.3: Provide input to promote protection of deer wintering areas and enhancement of deer habitat during management planning of state forests, wildlife management areas and other state managed lands.

Objective 5.3. Monitor changes in land use.

Strategy 5.3.1: As new land cover assessment data is available, update the status of existing deer habitat by WMU aggregate for use in monitoring deer harvest densities.

Goal 6: Operational Resources

Ensure that the necessary resources are available to support effective management of white-tailed deer in New York.

Achieving the desired goals associated with this plan will require sustained commitment of a variety of resources. Particularly with reduced staff levels, maintaining a group of trained staff able to dedicate time to deer management is critical.

Deer management, and most wildlife management, in New York is funded principally by sportspersons through the New York State Conservation Fund and the U.S Fish & Wildlife Service (USFWS) Federal Aid in Wildlife Restoration Act (also known as the Pittman-Robertson Act). The Conservation Fund consists of hunting, fishing and trapping license fees and miscellaneous other fees and fines collected by the DEC Division of Fish, Wildlife & Marine Resources. The Federal Aid in Wildlife Restoration Act derives funds through a federal excise tax on firearms, ammunition, and bowhunting equipment. Though sportspersons provide most of the funding for deer management in New York, they represent only a small fraction (<4%) of New York State residents and are just one of the many stakeholder groups that appreciate and are impacted by deer. DEC will take appropriate measures to ensure that resources are available to conserve and manage deer, including seeking to broaden the funding base for high priority work.

Additionally, DEC must be responsive to long-term cultural and ecological changes that affect deer populations and management and must identify opportunities to adapt to shifting values and new

challenges. DEC is currently investing in efforts to better understand the dynamics of hunter recruitment and retention in New York and to identify mechanisms to sustain or increase hunter participation. Outcomes from this effort will be incorporated in future deer management planning. DEC also recognizes that global climate change will alter the future landscape of wildlife management in New York. Efforts to understand and predict the impacts to deer are necessary for long-term management planning.

Objective 6.1. Maintain a staff of well trained, properly equipped and adequately protected employees to conduct deer-related work in New York.

Strategy 6.1.1: Conduct annual training for staff in the techniques used to collect biological data from harvested deer (e.g., aging deer by tooth-wear- and replacement) to ensure reliable data.

Strategy 6.1.2: Maintain clear policy and protocols to direct staff in the conduct of duties, particularly in regard to human health and safety and any actions that may generate high public interest or potential controversy (e.g., lethal removal of animals for disease monitoring or removal of illegally held or escaped captive Cervids).

Strategy 6.1.3: Monitor new developments in capture techniques, firearms and immobilization drugs and delivery equipment. If appropriate, incorporate into staff training.

Strategy 6.1.4: Maintain fluency with the research, issues and deer management practices of other states and provinces.

Objective 6.2. Develop, maintain and implement research and strategies to address the effects of long term social, political and environmental factors on effective deer management program delivery.

Strategy 6.2.1: Consider long term strategies to maintain effective deer population control in the event of continued declines in hunter numbers.

Strategy 6.2.2: Identify opportunities to improve efficiency within the deer management program and implement changes as needed to retain an effective program through periods of fluctuating staffing and fiscal resources.

Objective 6.3. Identify alternative sources of support to conduct deer management activities in New York.

Strategy 6.3.1: Investigate the feasibility of using volunteers to assist with data collection efforts and population monitoring efforts.

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Informational Resources

New York Specific Resources

NYSDEC Deer Management Program
www.dec.ny.gov/animals/7211.html

NYSDEC Deer Hunting
www.dec.ny.gov/outdoor/7857.html

A Citizen's Guide to Managing White-tailed Deer in Urban and Suburban New York
www.dec.ny.gov/docs/wildlife_pdf/ctguide07.pdf

Deer Harvest Reporting and Harvest Calculation
www.dec.ny.gov/outdoor/47738.html

Annual and Historic Deer Harvests
www.dec.ny.gov/outdoor/42232.html

History of the White-tailed Deer in New York (Severinghaus and Brown, 1956)
www.dec.ny.gov/docs/wildlife_pdf/histdeernewyork.pdf

Summary of comments received during the 2009 Public Meetings on Deer Management
www.dec.ny.gov/animals/57795.html#summary

Understanding DMPs: Quota Setting and Permit Selection
www.dec.ny.gov/outdoor/47743.html

Deer Hunter Surveys
www.dec.ny.gov/outdoor/74971.html

General Deer Management Resources

An Evaluation of Deer Management Options
www.dec.ny.gov/docs/wildlife_pdf/Deermgtopt08.pdf

Baiting and Supplemental Feeding of Game Wildlife Species. Wildlife Society Technical Review 06-1.
http://wildlife.org/TechnicalReview

Caring for Deer & Forests: a resource center for Eastern North America
www.deerandforests.org

Community-based Deer Management A Practitioners Guide
http://wildlifecontrol.info/pubs/Documents/Deer/DeerGuide.pdf

Managing White-Tailed Deer in Suburban Environments - A Technical Guide
http://wildlifecontrol.info/pubs/Documents/Deer/Deer_management_mechs.pdf

Reducing Deer-Vehicle Crashes: Wildlife Damage Management Fact Sheet
http://wildlifecontrol.info/pubs/Documents/Deer/Deer-Vehicle_factsheet1.pdf

Reducing Deer Damage to Home Gardens and Landscape Plantings
http://wildlifecontrol.info/pubs/Documents/Deer/reducing%20deer%20damage.pdf

White-tailed Deer: Wildlife Damage Management Fact Sheet
http://wildlifecontrol.info/pubs/Documents/Deer/Deer_factsheet.pdf

Appendix 1. Timeline of Major Changes in NYS Deer Management

Year	Subject	Area*	Description
1705	Season	Counties	First known law protecting deer. Killing deer prohibited January through July.
1788	Season	NY State	First statewide law protecting deer, season closed January through July.
1880	Govmt	NY State	Eight Game Protectors hired by the Governor of New York
1895	Govmt	NY State	Fisheries, Game and Forest Commission formed
1900-1911	Sex/age	Adk & Cat	Deer of either sex may be hunted, except spotted fawns
1900-1908	Sex/age	C&W	"
1911	Govmt	NY State	Conservation Department formed from the Fisheries, Game and Forest Commission
1909-1937	Season	C&W	Closed to deer hunting
1912-1955	Sex/age	Adk & Cat	Bucks only, with antlers >3", scattered antlerless seasons
1938-1955	Sex/age	C&W	Bucks only, with antlers >3", short antlerless seasons ½ of years
1940	Implement	State	Longbow legal for deer hunting
1949	Licensing	State	Hunter education is required for all new hunters.
1956	Licensing	State	Special Archery License established with separate license fee
1962	Licensing	State	Party Permit system established
1970	Govmt	NY State	Department of Environmental Conservation formed from the Conservation Department (and others).
1973	Implement	State	Muzzleloader rifles are allowed during the regular season
1978	Hours	State	Hunting hours changed from 7:00 a.m.-5:00 p.m. to sunrise to sunset.
1981	Implement	SZ	Handguns of .35 caliber or larger can now be used in the Southern Zone
1982	Season	SZ	Southern zone late muzzleloading season established
1985	Licensing	State	Preference given to disabled veterans for receiving a DMP
1986	Licensing	State	Successful archers can apply for 2nd tag good for regular season.
1988	Implement	State	Shotguns with rifled barrels allowed for hunting deer
1988-1995	Season	State	DMP use allowed in increasing portions of archery and muzzleloading seasons (depends on Zone).
1991	Licensing	State	Successful muzzleloaders can apply for second tag good for regular season.
1991	Sex/age	State	Authority to restrict DMP harvest to antlerless deer only
1991	Licensing	State	Authority to issue more than one DMP to an individual

Year	Subject	Area*	Description
1993	Sex/age	State	All DMPs restricted to antlerless deer only
1993	Season	Region 7	Sunday hunting expanded to include Region 7
1997	Season	SZ	Sunday hunting expanded to include most of Western NY
1998	Season	State	DMUs changed to Wildlife Management Units (WMUs)
1999	Sex/age	SZ	Deer of either sex may now be taken in the Southern Zone muzzleloading season.
1999-2003	Season	NZ	DMPs available In Northern Zone for 2 WMUs (1999) then 4 WMUs (2002) then 5 WMUs (2003).
2002	Feeding	State	Established a prohibition on feeding wild white-tailed deer
2002	Licensing	State	DECALS, an computerized license sales system was implemented
2002	Licensing	State	License structure changed to separate tags for RBG (buck), Archery/Muzzleloader either sex, and Archery/Muzzleloader antlered only.
2002	Disease	State	Statewide Chronic Wasting Disease (CWD) surveillance started
2002	Licensing	State	DMPs may be transferred or signed over from hunter to hunter
2003	Implement	State	Scopes allowed on muzzleloader rifles during any season.
2005	Disease	Region 6	CWD found in 5 captive and 2 wild deer in Oneida County
2005	Season	SZ	Opening day of the Early Bow Season and Regular Firearms Season changed to Saturday; late bow and muzzleloader season extended to 9 days
2005-2006	Sex/Age	Region 3	Antler restriction (3 points on one side) pilot study in WMUs 3C and 3J (2005) and WMUs 3H and 3K (2006)
2008	Licensing	State	Junior Hunter Mentoring Program established allowing youths aged 14-15 to hunt big game with a firearm when appropriately accompanied by an experienced adult hunter
2008	Licensing	State	Online game harvest reporting
2010	Implement	State	Crossbows legalized for deer hunting during the Regular Firearms Season pending regulations to be adopted in 2011
2010	Disease	State	CWD Containment Area decommissioned; restrictions on intrastate transport of harvested deer lifted

* Adk = Adirondack
Cat = Catskills
NZ = Northern Zone
SZ = Southern Zone
C&W = Central – Western New York (DEC Regions 7, 8, and 9)

Appendix 2. Proposed Deer Hunting Season Structure

Hunters frequently express interest in modifications to deer hunting seasons in New York, though interests, objectives and justifications vary widely. DEC considers the existing season structure to be very functional for management purposes but supports inclusion of a special deer hunting opportunity for young hunters and recognizes the great potential value of an early muzzleloader season for antlerless deer when necessary. Thus, the following proposed deer hunting season changes are largely based on providing additional hunting opportunities rather than population management objectives.

Existing Southern Zone

Season	Schedule	# of Days	
		Min/Max	10-yr Ave.
Bow	Sat. following 2nd Mon. in Oct. to Fri. before Regular Season	28 / 35	33
Regular	3rd Sat. in Nov. for 23 days	23	23
Late Bow/Muzz	9 days immediately after Regular Season	9	9

October 2012

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

November 2012

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

December 2012

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

Proposed Southern Zone

Season	Schedule	# of Days	
		Min/Max	10-yr Ave.
Bow	Oct 1. to Fri. before Regular Season	45 / 51	48
Youth Hunt	Columbus Day Weekend; concurrent bow	3	3
Early Muzz	As needed in select areas (Strategy 2.2.6); 4 days after Youth Hunt; concurrent bow	4	4
Regular	3rd Sat. in Nov. for 23 days	23	23
Late Bow/Muzz	9 days immediately after Regular Season	9	9

October 2012

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

November 2012

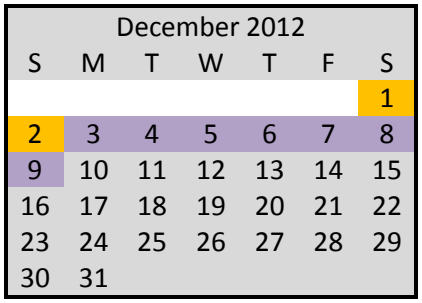
S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

December 2012

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

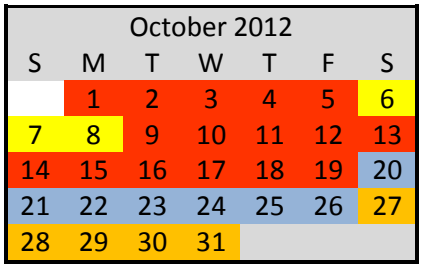
Existing Northern Zone

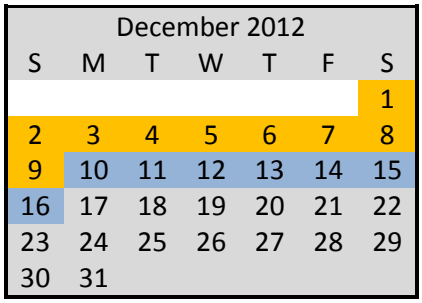
Season	Schedule	# of Days	
		Min/Max	10-yr Ave.
Bow	Sept. 27 to Fri. before Regular Season	21 / 27	24
Early Muzz	7 days ending Friday before Regular Season; concurrent bow	7	7
Regular	Next to last Sat. in Oct. to first Sun. in Dec.	44 / 51	45
Late Muzz	7 days immediately after Regular Season	7	7



Proposed Northern Zone

Season	Schedule	# of Days	
		Min/Max	10-yr Ave.
Bow	Sept. 27 to Fri. before Regular Season	25 / 31	28
Youth Hunt	Columbus Day Weekend; concurrent bow	3	3
Early Muzz	7 days ending Friday before Regular Season; concurrent bow	7	7
Regular	4th Sat. in Oct. for 44 days	44	44
Late Bow/Muzz	7 days immediately after Regular Season	7	7





Alternatives

In the 2010 Deer Hunter Survey (Enck et al. 2011), DEC explored hunter attitudes regarding a variety of possible season structure modifications including: inclusion of a special weekend opportunity for young hunters, lengthening bowhunting seasons, creation of new opportunities for muzzleloader hunters, and shortening of the regular seasons.

Timing of a Youth Hunt:

Though implementation of special firearms season for youth hunters was considered to be a good idea by a majority (59%) of hunters, no clear preference for timing of the season was apparent. In the survey, DEC suggested the following options for a youth hunt weekend:

- the weekend immediately prior to the regular season,
- a weekend in early November,
- a weekend in October, or
- the 3-day Columbus Day weekend.

Of these, none were strongly favored by hunters, but the first three options were considered to be a bad idea by significantly more hunters than who considered them a good idea. For the fourth option (i.e., youth hunt on Columbus Day weekend) hunter attitudes were fairly equivocal between those who thought it was a good or bad option or who had no opinion. While not part of the survey, DEC also discussed setting the youth weekend in mid or late September. The September option was considered less desirable because new hunters would need to purchase a license specifically for the youth weekend due to complications with the license year ending September 30.

Thus, DEC recommends that a youth hunt be implemented during the Columbus Day weekend. This timing affords young hunters three days of hunting during a period with generally mild weather. DEC anticipates that roughly 16,000 young hunters may participate in the youth deer hunt and have minimal impact on activities or success of New York's 200,000 bowhunters.

Lengthening of Bow Seasons:

DEC discussed several options to extend bowhunting opportunity in the Northern and Southern Zones. For both zones, consideration was given to impacts from inclusion of a youth hunt. Given the current license year (October 1 to September 30), beginning the Northern Zone bow season earlier in September is not preferred as it would exacerbate complications with permit issuance in one season and potential use the following September. Lengthening the Northern Zone bow season beyond what is proposed in this plan, would require shortening of the regular season to avoid hunting deer in late December when deer frequently begin to concentrate in winter yards. To maximize opportunity for bowhunters in the Northern Zone, this plan proposes to keep bowhunting season open during the youth hunt.

In the Southern Zone, DEC considered starting the bow season immediately following the youth firearms weekend. However, with the youth hunt proposed for Columbus Day weekend, this would

provide only 4 additional weekdays for bowhunters. Starting bow season on October 1 provides bowhunters an average of 15 additional days, of which between 5 and 11 days precede the youth hunt.

Additional Muzzleloader Opportunity:

DEC explored the potential options of including a special opportunity for use of traditional muzzleloaders (i.e., flintlock, sidelock, and matchlock muzzleloaders) and implementing an early muzzleloader season in the Southern Zone. In the 2010 survey of deer hunters, relatively few hunters (20%) considered adding a traditional muzzleloader season to be a good idea, and most hunters indicated that they would not likely participate. At the present time, DEC does not believe adding a special season for traditional muzzleloaders is justified.

On the other hand, an early muzzleloading season throughout the Southern Zone could be an important tool for antlerless harvest management in the future. This plan only calls for an early muzzleloader season for antlerless deer in select portions of the Southern Zone under specific circumstances (Strategy 2.2.6). That is because DEC's current tag structure provides all muzzleloader hunters an either-sex or antlerless-only tag, and the potential increase in antlerless harvest associated with an early muzzleloader season under this tag structure would not be appropriate in all portions of the Southern Zone. If the antlerless tag structure becomes wholly based on Deer Management Permits (Appendix 5.6), an early muzzleloading season for antlerless deer could be included throughout the Southern Zone without hindering management in areas where deer populations are below desired levels. An early muzzleloader season would provide greater equity of opportunity for muzzleloader hunters and could aid management by providing a focused opportunity on antlerless deer prior to the rut and during a time period when adult does are more readily distinguished from fawns.

In the 2010 survey, slightly more hunters considered an early muzzleloader season to be a good idea (45%) than a bad idea (41%). For those who considered it a bad idea, their primary reasons were related to potential impact on other seasons. With the lengthening of early bowhunting season as proposed in this plan, an early muzzleloader season may be acceptable to more hunters. Indeed, 70% of hunters who favored starting the bowhunting season earlier indicated that they thought it was a good idea because it could allow time for a new or longer muzzleloader season. Even though hunter opinion currently appears divided on an early muzzleloader season, DEC believes that the management need and benefits of an early muzzleloader season may warrant implementing this tool in the future.

Adjusting Regular Seasons:

Consideration was given to shortening the regular season in the Northern Zone and/or Southern Zone. However, this was overwhelmingly considered to be a bad idea by both Northern and Southern Zone hunters (Enck et al. 2011). Some hunters suggested that DEC also consider shifting the start date of the regular seasons. This plan proposes to alter the regular season in the Northern Zone by shifting the start date one week later in many years to accommodate a youth hunt and slightly increase bowhunting opportunity. However, in the Southern Zone, no change to the regular season is necessary to accommodate the proposed youth hunt or create additional bowhunting opportunity.

The Southern Zone regular season accounts for the highest level of hunter participation and greatest amount of deer harvest. As such, modifications to the Southern Zone regular season would strongly affect hunting traditions in New York. DEC believes that beginning the regular season on a Saturday continues to be an important strategy to provide opportunity for school-aged hunters and small-business owners to participate. DEC does not see significant need to alter the Southern Zone regular season timing for management or social purposes.

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Appendix 3. Alternative Buck Harvest Strategies

In recent years, some hunters have asked DEC to enact regulations that allow more bucks to live to older ages and develop heavier bodies with larger antlers. All potential methods to manipulate buck age structure involve tradeoffs for hunters. Additionally, all potential methods vary with respect to ease of compliance, ease of enforcement, perceived fairness, concern for loss of opportunity, freedom of choice, change in buck age structure and potential impact on other aspects of deer management (e.g., antlerless harvest). Generally, buck age structure can be manipulated by either decreasing harvest of one or more particular age classes (e.g., yearlings) or by reducing overall buck harvest which increases buck survival.

Reduction of overall buck harvest may be accomplished through reducing buck harvest bag limits, establishing buck harvest quotas, shortening firearms seasons, or implementing earn-a-buck programs. Of these, buck harvest quotas and earn-a-buck programs would involve significant change for hunters, but they would also likely have the greatest impact on buck survival and associated shift in buck age structure. However, reducing the buck bag limit and shortening the firearms season are the options more frequently suggested by New York hunters.

Strategies to reduce harvest of particular age classes include antler point restrictions, antler width restrictions or age restrictions based on body characteristics. Though antler point restrictions are typically less precise for distinguishing between age classes, they are easier to understand and enforce than antler width or age restrictions. The criteria for any antler-based restriction would likely need to vary geographically, as antler characteristics within a particular buck age class differ across New York due to habitat differences.

Pilot Antler Restriction Program

Responding to local hunter interest, in 2005 and 2006, DEC initiated a pilot antler restriction program in four Wildlife Management Units (WMUs) in the southern Catskills to evaluate potential impacts on hunter satisfaction and deer harvest. Data from the pilot program indicate that harvest of yearling bucks has declined about 80%, consistent with the program's goal (Hurst and Kautz 2011). The average number of 2.5+ year old bucks in the harvest has increased 53%, and in 2009-2010, approximately 85% of adult bucks taken in the pilot units were 2.5 years old or older. As expected, the increased harvest of older bucks has not fully offset the drop in yearling buck harvest and the average buck take in the pilot area in 2009-2010 remained 22% below the pre-antler restriction levels of 2003-2004. WMU 3H is the only exception with recent buck harvests slightly above levels immediately prior to antler restriction implementation. The ratio of antlerless deer (does and fawns) to adult bucks reported by bowhunters in the Bowhunter Sighting Log, narrowed in the pilot area from an average of 4.6 : 1 in 2003-2004 to an average of 3.1 : 1 in 2009-2010. An identical trend was observed over the same time period in neighboring WMUs without antler restrictions.

Antler restrictions had no influence on deer-hunting participation in the pilot WMUs for the majority (60 -72%) of respondents (Enck and Decker 2011). Very few respondents were attracted to hunt in the pilot

WMUs because of antler restrictions (2-9%), or stopped hunting in the pilot WMUs because of antler restrictions (3-8%). Slightly more hunters in WMUs 3H and 3K indicated that they now hunt more days because of the antler restrictions, but the opposite trend occurred in WMUs 3C and 3J. Additionally, more non-local hunters indicated that they now hunt fewer days (19%) rather than more days (4%) in the pilot WMUs because of the restriction.

Impacts of the pilot antler restriction program on hunter satisfaction were mixed. Hunters in the pilot program generally reported higher levels of buck-hunting satisfaction than hunters in the broader southeastern region of New York, though the difference was nominal in WMUs 3C/3J (Enck et al. 2011, and Enck and Decker 2011). Additionally, the slightly increased levels of buck-hunting satisfaction reported by hunters in 3H/3K between 2007 and 2010 were consistent with increased satisfaction levels also observed in the broader region (Enck and Brown 2008a, Enck and Brown 2008b). Substantially more hunters reported being satisfied than dissatisfied with the level of protection afforded to young bucks and with the level of safety they felt in the pilot area. A majority of hunters reported being dissatisfied and having unmet expectations regarding: (1) the number of antlered bucks compared to antlerless deer seen, (2) the number of older, larger-antlered bucks seen, and (3) their opportunity to shoot larger-antlered bucks. A majority of hunters were also dissatisfied with the number of older bucks compared to the number of young bucks seen, and significantly more hunters reported being dissatisfied than satisfied with their freedom to choose which buck they could harvest.

Nonetheless, most hunters continued to express support for maintaining the mandatory program and reported that their experience in the pilot program has made them more likely to voluntarily pass up shots at small bucks in places without mandatory antler restrictions. This response mirrors that of hunters who participated in a quality deer management cooperative (QDM) in King Ferry, New York (Enck and Brown 2009). In that study, landowners and hunters were willing to continue participating in the QDM cooperative despite not experiencing their desired outcomes. It appears that participants' belief that QDM or an antler restriction program will eventually result in their desired outcomes has stronger influence than unmet expectations and mixed satisfaction levels on their willingness to have the programs continue.

Hunter Attitudes about Antler Restrictions in Other Portions of New York

Through the duration of the pilot program, some hunters continued to seek an expansion of mandatory antler restrictions into other portions of New York, and DEC solicited hunter opinions on a broader, statewide scale. In a 2007 survey, a majority of hunters (57%) indicated that they would support an experimental statewide regulation to protect a majority of young bucks (Enck and Brown 2008a), though hunters were not asked about their preferred type of experimental regulation. In 2009, prior to final assessment of the pilot program, DEC proposed a regulation to expand mandatory antler restrictions into several WMUs in the Catskill region. The proposal was withdrawn after public comments suggested that final evaluation of the pilot program was needed before moving forward with an antler restriction expansion (NYSDEC 2009).

Table 1. Hunter attitudes toward several potential buck management strategies from a 2010 survey of deer hunters in New York (Enck et al. 2011) with a calculated preference score.

Buck Management Option	Good Idea (%)	Neither Good or Bad (%)	Bad Idea (%)	Preference Score*
Mandatory antler restrictions – all season	57.4	8.1	34.4	11.5
Promotion of voluntary antler restrictions	53.6	16.6	29.7	11.9
2 buck bag limit; 2nd tag restricted to larger antlered bucks	50.2	13.3	36.5	6.9
1 buck bag limit for all hunters	49.7	11.3	39	5.4
Mandatory antler restrictions – part of season (e.g., 1st two weeks of regular season)	41.2	14.0	44.8	-1.8
Tag choice: 1 buck of any legal size or 2 bucks restricted to larger antlered bucks	38.7	17.7	43.7	-2.5
Shorten the regular season	18.1	8.0	73.9	-27.9

*Preference Score = ("% Good Idea" - "% Bad Idea")/2. This score averages the magnitudes of "% Good Idea" and "% Bad Idea" for determining overall preference. Higher scores indicate greater favor with less disfavor.

Then in 2010, to further elucidate hunter preferences, DEC conducted a statewide survey that presented hunters with a series of options, set in the context of likely outcomes and associated tradeoffs, that would provide varying degrees of protection to young bucks (Enck et al. 2011). Of the options provided, "set mandatory antler restrictions during all deer hunting seasons" and "promote voluntary restraint among hunters to pass-up shots at yearling bucks" were both considered to be a good idea by a near identical majority of hunters, while other options were viewed less favorably (Table 1). That these two seemingly incongruous options were both viewed favorably may be partially explained in that most hunters also reported perceiving less harvest protection for yearling bucks than they desired. Both voluntary and mandatory antler restriction programs would afford some additional protection to yearling bucks. Yet, most hunters also indicated that they were experiencing the minimum desirable level of freedom to choose which buck they could harvest. This presents a unique challenge in that any regulatory effort to protect young bucks from harvest, which may increase satisfaction for some hunters, will require some loss of freedom of choice or opportunity, which will likely decrease satisfaction for other hunters.

Additionally, when asked to identify which aspect of buck hunting is most important, 50% of hunters indicated that "having the freedom to choose which buck I shoot" is most important, while 40% indicated that "having the greatest prospects of shooting an older, larger antlered buck" is most important (Enck et al. 2011). Only 10% of hunters indicated that "having the option to take 2 bucks per year" is most important to them.

Biological Implications of Antler Restrictions in New York

DEC considers the primary impacts of mandatory antler restrictions to be of a social nature for hunters and does not anticipate significant biological impacts for deer. DEC anticipates:

- Due to intense hunting pressure in New York, reduced harvest of yearling bucks will mostly increase the number of 2.5 year olds in the pre-hunting season population with lesser increases in the number of 3.5 year old and older bucks.

- No significant change in breeding success or timing is expected from reducing harvest of yearling bucks. Recent data collected in New York indicate that >94% of female deer ≥1.5 years old are being bred, with >85% of conceptions occurring within a 28-day period in each study area. The research data reveal no concern for delayed or prolonged breeding periods, and suggest that the vast majority of does are bred during their first estrus cycle. In northern latitudes, the timing of breeding activity is largely tied to seasonal changes (i.e., day length) and deer condition. Similarly, antler restrictions have not significantly changed the timing or success of deer breeding in Pennsylvania (Pennsylvania Game Commission 2009).

- Increased number of ≥2.5 year old bucks may reduce breeding activity of some yearling bucks, potentially affording these yearlings additional time to feed and store fat for winter. However, the extent of which increased presence of older bucks may reduce energy expenditure of yearling bucks during the rut and subsequently increase survival of these yearlings through winter is unknown. Portions of New York with chronically severe winters currently have a greater proportion of bucks in older age classes than areas where winter severity is less frequently a concern. Further, yearling does are most receptive to yearling males (Ozoga and Verme 1985), and even in deer herds with large proportions of older bucks, yearling bucks continue to sire a substantial portion of the offspring (Sorin 2004, DeYoung et al. 2009). Thus, many yearling bucks are likely to continue expending energy during the rut through successful or unsuccessful attempts to breed despite potentially increased presence of older males in the population.

- Increased number of ≥2.5 year old bucks may increase the amount of buck sign such as rubs and scrapes. While this may impact hunter satisfaction, social factors of deer are not expected to noticeably impact the timing of deer breeding in northern portions of deer range (Miller et al. 1995) such as New York.

Primary improvements to the biological condition of a deer herd come from general decreases in deer density, or a shift in the balance of deer numbers relative to habitat productivity. That is, as deer numbers decrease or habitat conditions are enhanced, greater nutritional resources are available to each deer, thereby resulting in increased deer weights within each age class, increased antler development, higher productivity among fawn and yearling does, and greater overwinter survival.

Voluntary or Mandatory Antler Restrictions – What's Next?

Whether it's in support of mandatory buck harvest restrictions, or the right to choose whatever buck they want, New York deer hunters have strong feelings about the way they would like to see bucks managed in the state. Therefore, DEC believes that efforts to alter buck age structure should generally remain voluntary and not be mandated by regulation or legislation. Central to this recommendation is the fact that existing state regulations allow those wishing to practice restricted buck harvest management the opportunity to do so while still allowing those wanting no such restriction to hunt as they prefer. In this manner, hunters may, through their own individual and cooperative actions, increase the protection from harvest of young bucks toward their desired levels while not having their freedom of choice negatively impacted by state mandated restrictions. This approach is consistent with tenets of Quality Deer Management which is defined as "the voluntary use of restraint in the harvesting of young bucks combined with an appropriate antlerless deer harvest to maintain a healthy deer population in balance with the habitat" (Hamilton et al. 1995).

DEC does not consider there to be a compelling biological or management need for mandatory antler restrictions and evidence from the pilot antler restriction program suggests no changes in participation that would provide economic benefit for communities in an area with mandatory antler restrictions. However, DEC recognizes that interest in mandatory antler restrictions is strong among some segments of hunters and in some regional areas. Thus, this 5-year plan calls for continuing mandatory antler restrictions in the existing pilot area, and expanding mandatory antler restrictions in seven wildlife management units adjacent to the existing antler restriction area beginning with the 2012 hunting season (see strategies 2.3.5 and 2.3.6).

For other areas, this plan includes strategies that may assist hunters desiring to reduce harvest of young bucks individually or through development of hunting cooperatives. Many hunters already opt not to shoot young bucks, and over 2/3rds of hunters indicate they would be more likely to pass-up shots at young bucks if other hunters in their area would do the same (Enck et al. 2011). Even more hunters indicate they would be likely to pass-up shots at young bucks if there is increased evidence of older bucks in their area. This behavioral intention creates a positive feedback system that should benefit hunters who work with their neighbors to practice voluntary harvest restraint according to their own goals. As hunters work together to pass-up young bucks, more 2.5 year old bucks should be seen in subsequent years which will reinforce their drive to continue passing-up young bucks.

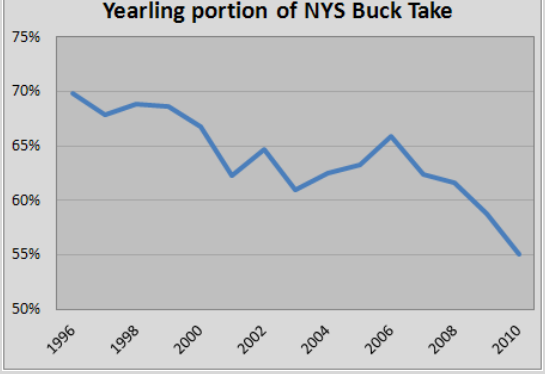

Figure 1. Yearling (1.5 year old) portion of the New York State buck harvest, 1996 – 2010. Ages determined by tooth wear-replacement analysis of harvested deer.

Over the past 15 years, the proportion of yearlings in the annual buck take has dropped 15 percentage points in the absence of mandatory antler restrictions (Figure 1). Ultimately, as more and more hunters

refrain from shooting young bucks, we will continue to see fewer yearling bucks and greater proportion of older bucks in the annual deer harvest.

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Appendix 4. Fertility Control of Deer

In its present state, fertility control is not a viable, stand-alone option for managing free-ranging deer populations in New York. Lethal control through hunting (including managed hunts) or culling is the most efficient and cost-effective mechanism to stabilize or reduce deer populations. Fertility control of free-ranging deer in New York is not currently allowed under standard deer damage permits issued pursuant to ECL 11-0521 and therefore may only be conducted pursuant to a license to collect and possess for scientific purposes. Accordingly, any proposal for fertility control must be for legitimate scientific research. Additionally, proposals for fertility control research on free-ranging deer in areas with abundant deer populations and associated deer-related damage and should only be considered as part of an integrated deer population management strategy that includes lethal removal[1] of deer.

The following information describes the current status of fertility control options for deer.

There are two methods for fertility control of deer:

(1) Surgical
(2) Chemical (contraceptive drug injection or hormone implants)

Surgical contraception

- Long-term and permanent.
- Nearly 100% effective.
- Adult female deer are captured and either operated on in the field using mobile surgical units, or transported to a fixed facility. It is a 20-minute procedure in the field and up to a 3 hour procedure in a fixed, surgical facility.
- Field procedures using mobile surgical units are not fully developed and somewhat controversial due to potential for infection.
- Costs are as much as $1,200 per deer.
- Cornell University is conducting a 5-year study of this procedure (http://wildlifecontrol.info/deer)

Chemical contraception

Gonacon

- Approved for use on deer by the Environmental Protection Agency (www.epa.gov/opprd001/factsheets/gonacon.pdf)
- Not approved for use on deer in New York State, except with DEC special license.
- Gonacon must be registered for use in New York with NYS DEC, Bureau of Pesticides before a special license can be issued.
- Only federal officials (USDA/Wildlife Services) will be authorized to use Gonacon and NYSDEC must concur with the application.

[1] Municipalities may waive or rescind local discharge ordinances for firearms and longbows to enable lethal removal of deer.

- Must be administered by injection (by hand).
- Approximately 67-88% efficacy the year following vaccination or boosting. Efficacy declines to 50% of treated does in the second year, thus a booster shot would be required probably annually or at least every other year.
- EPA registration requirements allow only for treatment of female deer.
- All deer must be handled at least once so that they may be marked with an ear tag.
- Tagging is necessary to identify deer that need booster shots (required every other year; optimal application is every year).
- Initial costs approximate $500 per deer for capture, tagging, and injection, but costs can increase to $2,000 - 3,000 per deer as a higher proportion of the herd is treated.
- To reduce deer abundance, the target should be to treat >90% of breeding-age female deer.
- Other population management methods (hunting or culling) must be implemented prior to or after treating female deer with Gonacon.
- No current use in New York State.

Porcine zona pellucida (PZP)

- Only available experimentally; not registered by the EPA.
- Requires an experimental use permit from the EPA and a DEC license.
- Best use is for captive (e.g., zoo) animals.
- High efficacy (approximately 85%) but an annual booster is required.
- A small percentage (10%) of female deer treated show bone marrow fat depletion. Ovarian scarring following treatment is permanent.
- All animals must be initially captured and tagged to enable subsequent booster shots.
- Costs are comparable to Gonacon. Cost per deer increases exponentially as more female deer are tagged and treated.
- Other population management methods (hunting or culling) must be implemented prior to or after treating female deer with PZP.

Considerations

- There are currently no oral contraceptives available for deer. All methods require the capture and handling of deer, as described previously.
- All methods for fertility control of free-ranging deer require a DEC License to Collect and Possess wildlife, which can be issued for scientific research purposes under the authority of ECL 11-0515 and 6 NYCRR Part 175.
- Deer captured with immobilizing drugs may require additional warnings on ear tags about consuming deer as there are withdrawal times for the drug residue to leave the deer's body. Withdrawal times vary by each drug from a few days to months.
- Application of deer fertility control is scale-limited. It becomes difficult to capture and treat sufficient numbers of female deer on areas larger than a few square miles.
- Deer contraception efforts will not be efficient in terms of both time and money unless ≥90% of the breeding female deer in a herd can be treated. Even at this level of treatment, populations may only be stabilized and not reduced.

- Deer contraception programs need to be a long-term (10 or more years at a minimum) commitment and should not be started if they are not going to be maintained. A few years without treatment of deer, and breeding females will negate contraception effects.
- Fertility control is not a viable approach when a quick reduction in deer numbers is sought. If effective, fertility control will reduce deer numbers slowly over 7-10 years, because birth control does not remove any existing deer, but rather prevents additions to the population. Deer populations only decline over time as deer die from other causes, most notably vehicle-strikes. Removing an adult female deer from the population has more than twice the impact on population growth than sterilizing an adult female. Deer are long-lived in suburban areas, and it may take years to see effects of fertility control on deer population size.
- Fertility control is typically sought by individuals or communities after deer-human conflicts have reached unacceptable crisis levels. With the long timeframe needed to achieve population stability or modest reductions, fertility control techniques have not demonstrated an ability to reduce deer-human conflicts in a timely manner.
- At the present time, fertility control has little or no broad deer management potential.

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Appendix 5. Legal Matters

Deer management and deer hunting activities in New York occur within the legal framework of the New York State Environmental Conservation Law (ECL). DEC is granted authority in the ECL to establish rules and regulations for some but not all aspects of deer hunting and deer management. The distinction between law and regulation is often a source of confusion for the public, many of whom mistakenly believe that DEC controls all things related to deer. The following section outlines several issues where modification of the ECL (which requires action by the New York State Legislature and Governor) may improve deer management efficacy and remain consistent with the public's interest for deer hunting and management.

1. Uniform minimum age of 12 years for all New York hunters.

New York hunters have long advocated the creation of additional opportunities for youth to hunt big game. Allowing interested youths to hunt big game with a firearm can foster lifelong participation in this outdoor sport, help increase recruitment of hunters, and perpetuate the effectiveness of hunters in managing deer populations throughout the state.

In 2008, establishment of the Mentored Youth Hunting Program reduced the minimum age for youth firearms hunting from 16 to 14 and set the framework for appropriate supervision by experienced hunters to develop a strong safety ethic in young hunters. Currently, forty-six states allow 12-year olds or younger to hunt big game with a firearm. Moreover, 12 year-olds have been allowed to hunt small game in New York with a firearm while accompanied by an adult since 1991. DEC strongly recommends that the minimum age for youth to hunt with a firearm be set to a uniform age of 12 years for all game species, including big game.

Additionally, DEC considers the current requirement for junior hunters and their mentor to remain on the ground while hunting with a firearm to be unnecessary. Many hunters prefer to hunt from an elevated position, and treestands designed for two hunters are widely available commercially.

2. Crossbow use by hunters in New York.

DEC supports the use of crossbows for hunting during all seasons in which other bowhunting equipment is allowed. The crossbow hunting law enacted in 2010 does not address deer management needs, nor is it consistent with hunter preferences. Deer populations in some portions of the state, particularly where access or firearm use is restricted, may cause serious impacts on forest regeneration, biodiversity protection, and public health. Crossbows are one additional tool to help DEC manage deer populations. Further, allowing crossbows to be used by hunters with physical disabilities – as well as family members with whom they enjoy spending their outdoor experience – will allow them to continue hunting. This is consistent with DEC's interests in connecting New Yorkers with nature.

A majority of New York deer hunters (including a majority of bowhunters) support legalization of crossbows, particularly for seniors (68%) and hunters with disabilities (78%) but also for all hunters during seasons when other bowhunting equipment is allowed (51%, Enck et al. 2011). Whereas, only

19% of hunters believe crossbow use should be limited to the regular firearms season, as the current law authorizes. DEC supports the use of crossbows during any hunting season in which other bowhunting equipment is allowed and recommends that eligibility to hunt with a crossbow be the same as eligibility to hunt with a vertical bow.

3. Reduce the setback distance for discharge of vertical bows and crossbows to 150 feet.

Currently, firearms, vertical bows (i.e., long bows, recurve bows and compound bows), and crossbows may not be discharged within 500 feet of certain structures without obtaining permission of specified property owners (ECL 11-0931[4]). The intent of the existing law was to promote public safety by regulating the discharge of hunting implements while permitting the affected landowners to allow hunters to discharge firearms and longbows within 500 feet of a structure. This restriction remains a prudent and appropriate safety measure for firearms but not for longbows and crossbows.

Arrows have a much shorter range than projectiles shot from a firearm. The maximum range of an arrow occurs when it is released at a 45 degree angle of elevation, from which it could theoretically travel a couple hundred yards. However, this trajectory is extremely unlikely in any bowhunting situation. Archery shots taken at deer are typically discharged either on a horizontal plane or on a downward trajectory. In these situations, an arrow travels only a short distance before either hitting the target or dropping to the ground. Moreover, most bowhunters prefer to shoot from an elevated position (e.g., tree stands or tree blinds), and arrows are discharged directly towards the ground. Bowhunting also typically occurs at much shorter ranges than firearms hunting (25 yards or less), meaning that the existence of unwanted objects in the field of fire is extremely rare.

Importantly, the existing 500-foot distance requirement greatly reduces the ability of bowhunters to harvest deer within 500 feet of structures and dwellings. A circle with a 500-foot radius encompasses a land area approximately 18 acres in size, and in many parts of the State, significant bowhunting opportunities exist on parcels of land this size and smaller. Specific examples include the suburban/rural interface of portions of Erie, Albany, Monroe, Westchester, and Suffolk Counties, and on a smaller scale, individual communities which have expressed increased interest in the use of archery hunting as a tool for controlling deer numbers.

In the last decade, the only reported injuries in New York State related to handling or discharge of bowhunting equipment were 2 self-inflicted cuts from careless handling of arrows with broadheads. Yet human injuries from deer-motor vehicle collisions in New York are estimated to be over 1,000 annually. A preponderance of these deer-motor vehicle collisions occur in areas where deer management is compromised by restricted hunting opportunities associated with the 500-foot discharge restriction.

DEC recommends that the setback distance for discharge of bowhunting equipment (longbows and crossbows) be reduced from 500 feet to 150 feet.

4. Remove constraints for deer hunters on Long Island.

Deer management on Long Island has long been a challenge. Intense development decreased the amount of land available for legal deer hunting, and public misconceptions about the safety of hunting resulted in a complex and onerous system of laws and regulations governing deer hunting. While a reduction in the distance setback for discharge of bowhunting equipment is one step to increasing land available for deer harvest management, reducing the constraints on hunters is also essential to improve management effectiveness and ability to meet the public's desires for deer on Long Island.

Allow Bowhunting in Nassau County: ECL 11-0907(5)

Deer hunting is not currently authorized in Nassau County (ECL 11-0907[5]), reflecting a time period when deer did not exist in the county. However, deer are now present in the northern half of the county and even in portions of eastern Queens. Landowners are reporting damage, and deer-vehicle collisions are occurring. With the large amount of green-space in northern Nassau County and no direct management through hunting, the deer population and associated deer-related damage will continue to increase. Allowing bowhunters to pursue deer in Nassau County during the same period as is authorized in Suffolk County would be a safe and proactive measure to control deer numbers.

Special January Firearms Season in Suffolk County: ECL 11-0903(7)

- **Eliminate the special hunting permit:** Current law requires hunters to obtain a special hunting permit issued by town clerks for their respective towns. This requirement was established in the 1960s when the January Firearms season originated and was designed to limit the number of participating hunters in each town. Applicant rates have been well below permit quotas and concerns for high hunter densities have not been realized. The town permit requirement is cumbersome for hunters, municipalities and DEC, and is inconsistent with hunting requirements elsewhere in New York. Elimination of these permits will reduce the regulatory burden on hunters while still allowing effective deer and hunter management.

- **Allow archery tackle to be used during the Special January Firearms Season:** Current law specifies that deer may only be taken with shotguns or muzzleloading firearms during the Special January Firearms Season. However, throughout the rest of New York, the law allows hunters to take deer with bowhunting equipment during regular firearms seasons. Likewise, hunters on Long Island should be able to hunt with bowhunting equipment during the Special January Firearms Season if they so choose. In some cases, landowner permission may be dependent on hunters' use of bowhunting equipment rather than a firearm. Areas where firearms may be used during the Special January Firearms Season are specified in regulation. Many additional portions of Nassau and Suffolk counties are very suitable for safe hunting with bowhunting equipment. Allowing hunters to take deer with bowhunting equipment during this extended season will enhance deer management efforts on Long Island.

- **Expand the hunting during the Special January Firearms Season to include weekend hunting:** Current law restricts deer hunting during the Special January Firearms Season to weekdays. Allowing hunters to also pursue deer over weekends will increase hunting opportunity for business owners and school-aged hunters and will enhance deer management efforts on Long Island.

Special Opportunity for Junior Hunters Prior to the January Firearms Season

This plan outlines DEC's intent to implement a special opportunity for junior hunters to hunt deer with firearms in upstate New York. Providing a similar opportunity for junior hunters on Long Island is not allowed by current law. A youth hunt opportunity could be developed by allowing deer hunting on weekends during the January Firearms Season and reserving the first weekend for youth.

5. Enhance law enforcement and increase penalties for deer hunting violations.

The current penalties for violating the Fish and Wildlife Law have been in place since 1996 and the current fines and civil penalties no longer serve as sufficient deterrents. Increasing the penalties for the violations related to failure to exhibit the appropriate license, permit, or tag will help to ensure that violations are considerably more costly than the cost of buying a license or permit. Without a penalty increase, some persons will continue to decide that hunting without the appropriate license is more economical than purchasing a license, even if they are caught and fined.

Additionally, it is suspected that hundreds of large antlered bucks and other deer are poached each year, being shot illegally with the aid of a light, with the aid of bait, outside of legal hunting seasons, by unlicensed individuals, or through some other prohibited means. Existing fines and penalties are insufficient to deter such violations. For example, hunting deer over baited stands is becoming more pervasive, and products available for baiting activity are readily available at local sporting goods and feed stores as well as on-line and by mail order. Often, violators of baiting-related offenses spend hundreds to thousands of dollars on automatic bait dispensing devices and feed of various types. Some documented cases involve electronic motion detectors, solar powered automatic feeders, salt/mineral or feed blocks, and truck loads of corn, apples, or other food. The current maximum fine of $250 for hunting over bait is a small portion of what the violator already has invested in an illicit operation.

DEC supports an increase of the penalties for the illegal taking of deer and efforts to enhance law enforcement capabilities.

6. Restructure the issuance of carcass tags for antlerless deer.

Throughout New York, hunters are issued carcass tags valid for antlerless deer only or deer of either sex when they purchase the privilege to hunt during bow or muzzleloading season. This "3/2 tag system" gives multi-season hunters the opportunity to harvest a total of three deer, of which 2 may be antlered bucks, in addition to any Deer Management Permits (DMPs) they may acquire. Under some

circumstances, the "3/2 tag system" also allows a hunter to take up to 3 antlerless deer, in addition to their DMPs.

Annual fluctuations in bowhunting and muzzleloading participation can substantially affect antlerless harvest within a management unit, and long-term increases in participation have yielded increased deer harvests during bow and muzzleloader seasons (Figure 1). While increased takes are often welcome, when deer populations are low and few DMPs are available, hunter activity and antlerless harvest tends to shift toward the bow and muzzleloader seasons. As a result, DEC must further restrict DMP issuance in these areas to compensate for increased take by bow and muzzleloader hunters. This scenario reduces DEC's ability to stimulate deer population growth, and it exacerbates a disparity of opportunity for regular season hunters who are limited to harvest of antlerless deer through DMPs issued by lottery.

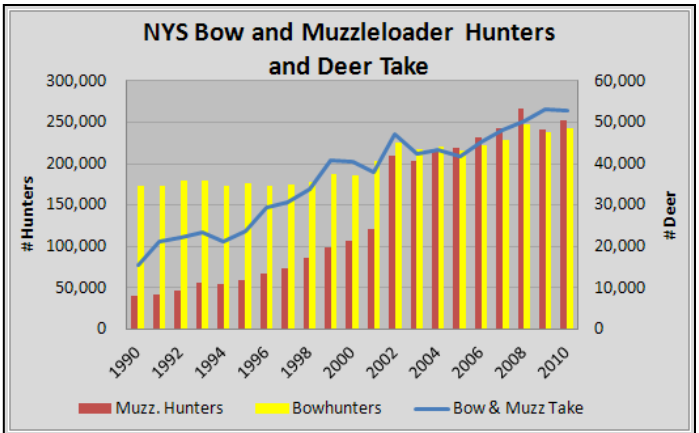

Figure 1. Trend in licensed bow and muzzleloader hunters and their deer harvest in New York State, 1990 – 2010.

This deer management plan includes several strategies as a temporary solution (Strategies 2.2.3 to 2.2.6), but ideally, all antlerless harvest statewide would occur through use of DMPs. Therefore, DEC believes it is prudent to discontinue use of either-sex and antlerless-only bow and muzzleloader tags for antlerless harvest and transition to an antlerless harvest system based on DMPs in all portions of New York State (Strategy 1.3.2).

Current law (ECL 11-0913) authorizes DEC to issue Deer Management Permits (DMPs) throughout the Southern Zone and in specific portions of the Northern Zone. Yet, in large portions of northern New York, DEC is not authorized to issue DMPs and antlerless harvest occurs only during bowhunting and muzzleloader seasons. In these areas, antlerless harvest is periodically adjusted through changes in season length and harvest regulations of muzzleloader hunting seasons. However, this process is cumbersome, less responsive to changing management needs, and is less equitable for hunters.

DEC believes DMPs should be allowed in all of New York State and anticipates the following beneficial outcomes:

- finer control over antlerless deer harvests and deer populations in all portions of New York;
- more equitable distribution of antlerless harvest opportunity;
- simplified antlerless harvest regulations; and
- an early muzzleloader season could be implemented across the Southern Zone, which will improve management capacity and provide greater equity of hunting opportunity for muzzleloader hunters, without compromising DEC's ability to limit antlerless harvest in areas with low deer populations.

Since most hunters demonstrate less willingness to harvest antlerless deer than antlered deer, DEC recognizes that elimination of either-sex and antlerless-only bow and muzzleloader tags may be a disincentive for some hunters to pursue antlerless deer. Accordingly, DEC also believes that the application fee for DMPs should be reduced or removed.

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Appendix 6. Additional Concepts

Through development of this deer management plan, many good ideas surfaced which DEC feels are worthy of inclusion but could not realistically be accomplished given our limited resources and higher priority strategies in this plan. Several of these additional strategies are presented here. These items may be explored over the course of this deer plan if time allows, or they may be incorporated in future planning efforts if deemed necessary at that time.

Hunting and Recreation

Partner with other organizations to develop a guidance program for landowners, individuals and cooperative groups of hunters on voluntary implementation of specialized deer management programs (e.g., antler restrictions, Quality Deer Management [QDM], trophy deer management).

Conflict and Damage Management

Explore development of a landowner-hunter match program to assist farmers, suburban landowners, preserve managers, municipalities and others identify hunters who may help meet their deer management objectives.

Education and Communication

Annually offer presentations by DEC deer biologists at each DEC Environmental Education Center.

Work with the Division of Public Affairs and Education to develop a hands-on teaching tool (e.g., “deer bin” with a deer hide, skull, antlers, track set, DVD on living with white-tails, curriculum materials) to assist educators in teaching about white-tailed deer biology, history, management, recreational opportunities, and impacts that deer have on ecosystems and people in New York. Prepare a “deer bin” for each DEC Camp and Environmental Education Center and have them available for reservation by local educators.

Build a deer exclosure (i.e., small area bound by a deer-proof fence) with an explanatory sign or kiosk on each upstate DEC Environmental Education Center property to illustrate the impact of deer browse on forest composition and structure, and make plans and sign verbiage available to any nature center, forest owner, or land manager interested in erecting an exclosure as a teaching tool on their own lands.

Deer Habitat

Evaluate the feasibility of generating an updated inventory of deer wintering areas to provide guidance for local, regional, and state habitat and land planning efforts.

Operational Resources

Develop models which predict the effects of climate change on deer distribution, survival, productivity and other potential consequences (e.g., disease transmission, habitat changes) associated with a warmer landscape.

Investigate social trends in acceptance of deer management in the future, and develop plans to ensure the public remains well informed and supportive of deer population management and its benefits.