

Department of  
Environmental  
Conservation

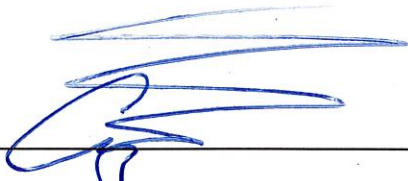
# Management Plan for White-Tailed Deer in New York State, 2021–2030

May 2021

Andrew M. Cuomo, Governor | Basil Seggos, Commissioner



# Management Plan for White-Tailed Deer in New York State, 2021–2030



Anthony Wilkinson  
Director, Division of Fish and Wildlife



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Chief, Bureau of Wildlife

June 7, 2021

Date

# NEW YORK STATE DEER MANAGEMENT PLAN

## Mission of the Bureau of Wildlife

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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.

## Acknowledgments

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## Table of Contents

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<b>Mission of the Bureau of Wildlife .....</b>	<b>3</b>
<b>Acknowledgments .....</b>	<b>3</b>
<b>Table of Contents .....</b>	<b>4</b>
<b>Introduction .....</b>	<b>5</b>
<b>Complementary Programs .....</b>	<b>6</b>
<b>Legal Mandate .....</b>	<b>7</b>
<b>Plan Update Process .....</b>	<b>8</b>
<b>Summary of Accomplishments from 2012–2016 Deer Management Plan .....</b>	<b>10</b>
<b>History of Deer and Deer Management in New York .....</b>	<b>13</b>
<b>Goal 1: Population Management .....</b>	<b>15</b>
<b>Goal 2: Hunting and Recreation .....</b>	<b>21</b>
<b>Goal 3: Conflict and Damage Management .....</b>	<b>27</b>
<b>Goal 4: Education and Communication .....</b>	<b>32</b>
<b>Goal 5: Deer Habitat .....</b>	<b>33</b>
<b>Goal 6: Operational Resources .....</b>	<b>37</b>
<b>Literature Cited .....</b>	<b>38</b>
<b>Informational Resources .....</b>	<b>43</b>
<b>Appendix 1. Timeline of Major Changes in New York State Deer Management .....</b>	<b>44</b>
<b>Appendix 2. Identifying Desired Deer Population Trajectories .....</b>	<b>48</b>
<b>Appendix 3. Recommendation to Prohibit Cervid Biofluids in New York .....</b>	<b>61</b>
<b>Appendix 4. Deer Harvest Calculation in New York .....</b>	<b>68</b>
<b>Appendix 5. Deer Management Permits: Setting Quotas and Allocating Tags .....</b>	<b>72</b>
<b>Appendix 6. Deer Damage Complaint Evaluation Process .....</b>	<b>75</b>
<b>Appendix 7. Fertility Control of Deer .....</b>	<b>76</b>
<b>Appendix 8. Legal Matters .....</b>	<b>79</b>

## Introduction

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.



Photo courtesy of the Adirondack Ecological Center of SUNY ESF

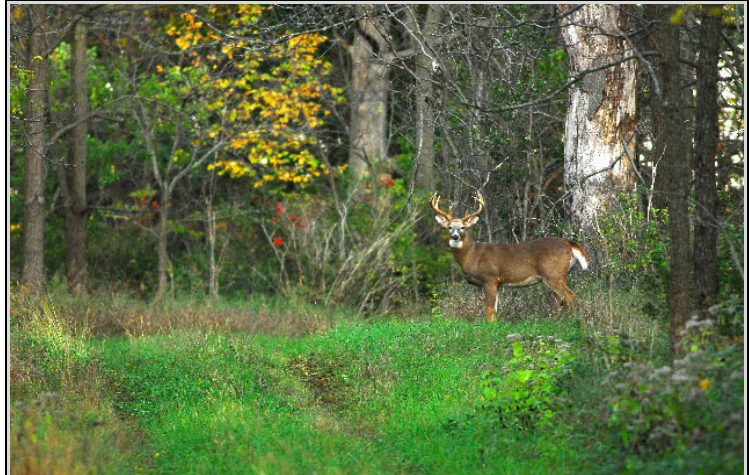
The purpose of New York's deer management plan, the *Management Plan for White-Tailed Deer in New York State, 2021–2030* is two-fold: the first is to outline the components of New York's deer management program in a single document, allowing for public review, comment, and understanding, which are important elements as DEC seeks to manage deer in the public interest. The second purpose of this plan is to provide strategic direction for deer management in New York over the next 10 years.

This plan maintains six primary goals identified in the previous *Management Plan for White-Tailed Deer in New York State: 2012–2016* that encompass the 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 the benefits of deer hunting and enhance its usefulness as a 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. Many of the strategies identified in this plan are descriptions of activities that are already occurring in the deer management program. Other strategies reflect new work or propose new concepts to be more fully explored or implemented during the 10-year period of this plan. Deer management must be dynamic, adapting to changes in deer population status, associated impacts,

and public values. As such, elements of this plan (e.g., population trajectories, deer-hunting strategies) will be reviewed and modified as necessary within the 10-year plan period.

Successful implementation of many aspects of this plan will require greater levels of cooperation and partnership within divisions of DEC and between DEC and other organizations and agencies. 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



**Photo courtesy of Dick Thomas**

human development, and climate change). DEC's ability to understand, predict, and respond to these influences will be foundational to maintaining effective deer management in the future. This plan identifies the need for long-term planning and research but also provides recommendations for immediate actions that will help to reduce human-deer conflicts and better align deer population objectives with impacts of deer 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 its people.

## Complementary Programs

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The management activities outlined in this plan will guide the work of deer management program staff within DEC's Division of Fish and Wildlife. However, deer populations and deer management in New York benefit from the work of a variety of DEC units. Deer program staff often work closely with other DEC units on many complementary activities, though these activities may primarily exist for other purposes and may be guided by management plans and policies of the other DEC units.

### Complementary activities include, but are not limited to:

- habitat management on Wildlife Management Areas, including the creation of [young forest](#);
- State Forest management planning;
- State land acquisition and conservation easements;
- private land forest management and habitat conservation;
- hunter education;
- wildlife health; and
- law enforcement and forest protection.

## Legal Mandate

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The basis for New York's deer management program is established in the New York State Environmental Conservation Law (ECL) Article 11, which spells out the authority, responsibility, and policy related to management of the white-tailed deer resource. DEC is granted authority by the ECL to establish rules and regulations for some, but not all, aspects of deer hunting and deer management. Briefly paraphrased, the predominant statutes include:

### Section 11-0105

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

### Section 11-0303

DEC is directed to restore, maintain, and improve the state's fish and wildlife resources, and make these resources accessible for recreational purposes to the people of the state. DEC is directed to carry out programs that (a) promote natural propagation and maintenance of desirable species in ecological balance, and (b) lead to the observance of sound management practices, having regard to (1) ecological factors, including 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.

### ECL § 11-0521

DEC is authorized to issue permits to take deer that are destructive to public or private property or are a threat to public health or safety.

### ECL § 11-0903

DEC is granted limited authority to establish regulations for the open seasons, bag limits, and manner of taking deer.

Additionally, DEC's wildlife management activities and their impacts are described in the *Programmatic Environmental Impact Statement on Wildlife Game Species Management Program of the Department of Environmental Conservation Division of Fish and Wildlife* (DEC, 1980) and reiterated in the *Supplemental SEQR Findings and Decisions* (DEC 1994). DEC's white-tailed deer management program, as outlined in this plan, is consistent with the accepted principles, practices, and actions specified in these documents and in accordance with the authorities established in the state's Fish and Wildlife Law, ECL Article 11.

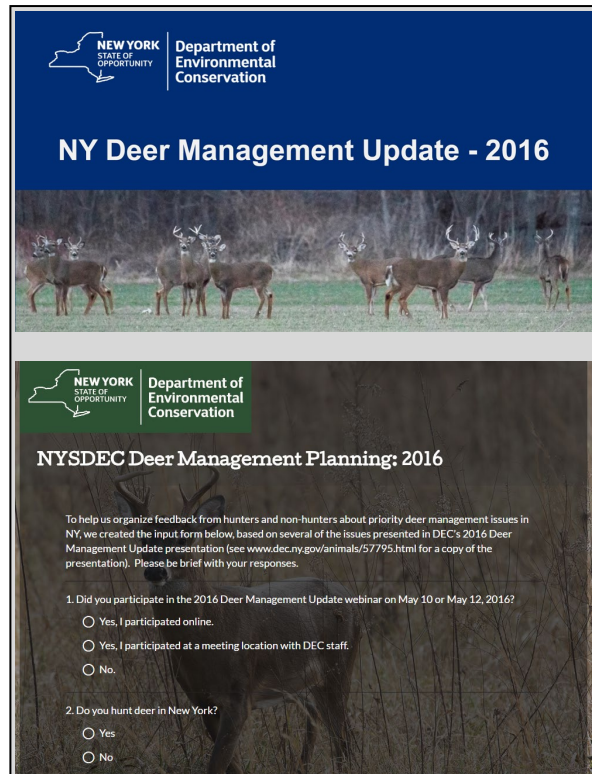
## Plan Update Process

This plan updates the *Management Plan for White-Tailed Deer in New York State, 2012–2016* (DEC, 2011). Revisions largely reflect continued progress and evolution of the deer management program, with completed actions removed from the plan, continued actions modified and clarified as appropriate, and new actions recommended in accordance with current management priorities and needs.

Public input is a critical component of the deer management program, and the plan revision process included the following components:

### 1. 2016 public meetings and input process

In May 2016, DEC hosted an information sharing event in which the public was invited to connect with staff in-person at 20 meeting venues across the state or participate remotely via the internet. DEC presented a status update of the deer management program, identified priority issues and several key challenges, and created an opportunity for the public to provide feedback with their concerns and interests for deer management in New York. Concurrent with the public meetings, DEC posted a Deer Management Planning Public Input Form online for meeting participants and other interested individuals and groups to share their perspective on a variety of deer management topics. The feedback that DEC received helped inform several aspects of this plan, including antlerless and buck harvest management, urban and suburban deer management, setting population objectives with data on deer impacts to forests and public preferences, and protecting New York deer from chronic wasting disease (CWD).



### 2. Public surveys for deer population preferences

From 2018 to 2020, DEC and the Center for Conservation Social Science at Cornell University conducted surveys of New Yorkers to understand their interests and concerns related to deer and how they would like the deer population to change in their local area in the future ([Appendix 2](#)).

### 3. Plan writing

DEC reviewed the various forms of public input received, as well as input gathered through regular informal interactions with the public, in conjunction with current deer management priorities to establish the goals, objectives, and strategies laid forth in this plan.



#### 4. Public review and comment

A draft of this deer management plan was released on November 27, 2020, for 30 days of public comment. DEC received comments from over two thousand individuals and organizations. Subsequently, DEC reviewed and summarized the most substantive comments and made several significant changes to the final version of this plan. An *Assessment of Public Comment on the Draft NYS Deer Management Plan, 2021–2030* is available on [DEC's Deer Management webpage](#). Primary changes from the draft plan include:

- [Introduction](#) – emphasized that deer management is adaptive, and modifications can be made as needed within the 10-year time frame of this plan.
- [Complementary programs](#) – added this section to acknowledge other program areas and activities of DEC which benefit deer and deer management.
- [Goal 1 description](#) – added information about how DEC addresses non-hunting mortality sources of deer (e.g., predation, deer-vehicle collisions).
- [Goal 2 description](#) – added more information about the mandatory antler restriction program.
- [Strategy 2.2.1](#) – added a new routine activity to clarify that DEC continually monitors and evaluates existing hunting seasons and will make changes as needed.
- [Strategy 2.4.3](#) – clarified that DEC will also work with federal land managers to increase land access for deer hunters.
- [Strategy 4.2.2](#) – clarified intent for DEC staff to participate in periodic meetings of hunting organizations and other conservation or civic organizations to provide information and gather feedback about deer management.
- [Strategy 5.1.2](#) – clarified that the Assessing Vegetation Impacts of Deer (AVID) protocol will be prioritized in areas where forest regeneration is compromised, and that as data are acquired, the AVID protocol will be used to inform decisions about deer population trajectories.
- [Strategy 6.2.2](#) – added a new strategy to seek opportunities to engage elected officials on deer management issues.
- [Appendix 2: Deer Population Trajectories](#) – modified the decision framework for setting deer population trajectories to acknowledge that regeneration debt levels of 1 represent vulnerable forests and to emphasize the benefit of AVID as an additional metric of deer impacts in WMU Aggregates with regeneration debt. We also added information on public survey methodology and demographics of respondents.
- [Appendix 3: Recommendation to Prohibit Cervid Biofluid Products](#) – updated the text and cited new research that found the infective dose of prions is substantially smaller than previously thought.
- [Appendix 8: Legal Matters](#) – emphasized that in relation to matters governed by the Environmental Conservation Law (e.g., crossbows, hunter age, areas closed to deer hunting, tax incentives), DEC can only provide recommendations. Law changes can only be accomplished through the legislative process.
  - [Hunter Age](#): clarified that youth hunters require supervision by licensed, experienced adult hunters; corrected text to reflect that New York is the only state that does not allow youths 12 years old or younger to hunt deer with a firearm.

While this plan indicates DEC's intended direction for deer management and deer hunting, implementation of some strategies will require new or amended state regulations. As such, all regulation proposals will be subject to an additional 60-day public comment period during the formal rule-making process.

# Summary of Accomplishments from 2012–2016

## Deer Management Plan

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The Big Game Team, comprised of DEC biologists tasked with deer management responsibilities, was responsible for carrying out the tasks outlined in the previous management plan. Below are summaries of accomplishments for each goal of the plan.

### Goal 1: Population Management

In addition to completing routine annual tasks of monitoring deer abundance, calculating deer harvest, issuing deer management permits (DMPs), and monitoring deer for disease, DEC:

- delineated Wildlife Management Unit (WMU) Aggregates based on key ecological criteria associated with deer biology and abundance to strengthen deer harvest data;
- enhanced the data inputs used to calculate the winter severity index for deer;
- piloted a modified citizen task force process to provide input on deer population objectives;
- surveyed New Yorkers across the state to understand public perceptions of deer impacts and determine the public's desire for deer population change; and
- adopted CWD surveillance, response, and risk-minimization plans and adopted regulations to further protect wild deer from CWD.

#### **Resulting publications (see [Literature Cited](#) section for full citations)**

White-tailed deer productivity in New York (Hurst and Kirsch, 2012)

Surveillance plan for chronic wasting disease in New York State (DEC, 2013)

Challenges for multilevel stakeholder engagement in public trust resource governance (Pomeranz et al., 2014)

Can managers compensate for coyote predation of white-tailed deer? (Robinson et al., 2014)

New York State Interagency chronic wasting disease response plan, 2015–2025. (DEC, 2015)

Residents' attitudes about deer and deer management in the Central Finger Lakes Management Unit (Siemer et al., 2015)

Evaluation of a pilot program to improve public input about deer and deer impacts (Pomeranz et al., 2017)

Participant evaluation of webinar series to support deer management in the Central Finger Lakes WMU Aggregate (Siemer et al., 2017)

New York State interagency CWD risk minimization plan (DEC, 2018)

Understanding local residents' deer population preferences: Results from a 2018 survey of 7 Wildlife Management Unit Aggregates (Siemer et al., 2018)

Local residents' deer population preferences: Results from a 2019 survey of 8 Wildlife Management Unit Aggregates (Siemer et al., 2019)

Local residents' deer population preferences: Results from a 2020 survey of 8 Wildlife Management Unit Aggregates (Siemer et al., 2020)

## Goal 2: Hunting

Because hunting is a critically important deer management tool, DEC staff routinely work to maintain hunting regulations that balance deer management needs with hunter satisfaction and broader public interests. Following recommendations of the previous plan, DEC:

- established a youth-only Big Game Hunt over the Columbus Day Weekend;
- expanded bowhunting seasons in the Northern and Southern Zones;
- changed regulations to allow Deer Management Permits (DMPs; antlerless tags) to be used during bowhunting and early muzzleloader season in the Northern Zone;
- tested a strategy to increase antlerless harvest in areas where deer populations were above desired levels by expanding the use of Bonus-DMPs and making a portion of the early bowhunting and late muzzleloading season restricted to antlerless deer only;
- expanded mandatory antler point restrictions into seven additional WMUs;
- conducted an extensive, structured decision-making process to identify the optimal strategy for buck harvest, then initiated an education campaign to encourage hunters to voluntarily [Let Young Bucks Go and Watch Them Grow](#);
- expanded open areas and lengthened the January firearms deer season in Suffolk County; and
- worked with the Office of Parks, Recreation and Historic Preservation to allow deer hunting in several additional State Parks and expand deer hunting opportunity in others.

### **Resulting publications (see [Literature Cited](#) section for full citations)**

A structured decision-making approach to white-tailed deer buck harvest management in New York State (Robinson et al., 2015)

Hunter satisfactions with deer harvest opportunities in New York State (Siemer et al., 2015)

Delineation of management zones for buck harvest decision making (Kelly and Hurst, 2016)

Structured decision making as a framework for large-scale wildlife harvest management decisions (Robinson et al., 2016)

Effects of antler point restrictions on white-tailed deer harvest in New York State (Kellner et al., *in review*)

## Goal 3: Deer Damage

To address deer-related impacts on cropland, managed forests, and in developed areas, DEC staff annually issue Deer Damage Permits (DDPs) and administer the Deer Management Assistance Program (DMAP) to provide property-specific deer management for landowners. Additionally, DEC:

- increased enforcement of regulations and permit conditions associated with the DDP and DMAP programs;
- updated guidelines and procedures for issuing DDPs and DMAP permits;
- created a deer management focus area, with liberal harvest limits and extended seasons, in Tompkins County ([www.dec.ny.gov/outdoor/82382.html](http://www.dec.ny.gov/outdoor/82382.html)) to test the “focus area” strategy for alleviating deer overabundance problems in urban/suburban areas;
- updated DEC’s deer management guidance document for communities ([www.dec.ny.gov/docs/wildlife\\_pdf/commdeermgmtguide.pdf](http://www.dec.ny.gov/docs/wildlife_pdf/commdeermgmtguide.pdf));

- reported to the New York State Legislature on *Deer Management in Urban and Suburban New York* ([www.dec.ny.gov/docs/wildlife\\_pdf/decdeerreport18.pdf](http://www.dec.ny.gov/docs/wildlife_pdf/decdeerreport18.pdf)); and
- approved research projects investigating the utility of sterilization and immuno-contraception for controlling deer populations in five communities: Cayuga Heights, East Hampton, Hastings-on-Hudson, Head-of-Harbor, and Staten Island.

**Resulting publications (see [Literature Cited](#) section for full citations)**

Hunter, landowner, and local resident viewpoints on the Central Tompkins County Deer Management Focus area (Siemer et al., 2015)

## Goal 4: Education and Communication

In addition to routine press releases, e-newsletters, and social media posts, DEC staff provide numerous presentations to school, community, and conservation groups to inform the public about deer biology and management and gather feedback about public concerns and interests. Following recommendations of the previous plan, DEC also:

- hosted a series of online and in-person public meetings on deer management;
- collected public feedback about deer management via an internet survey in 2016;
- updated deer management webpages on the DEC website and created webpages on deer overabundance ([www.dec.ny.gov/animals/104911.html](http://www.dec.ny.gov/animals/104911.html)) and community deer management ([www.dec.ny.gov/animals/104961.html](http://www.dec.ny.gov/animals/104961.html));
- produced a special issue of DEC's *Junior Naturalist Journal* featuring white-tailed deer; and
- developed flyers about [forest impacts caused by deer](#) and [what DEC is doing about chronic wasting disease](#).

## Goal 5: Habitat

Because most land in New York is privately owned, DEC indirectly influences habitat conditions by increasing or decreasing antlerless harvest and educating the public on how to improve habitat for deer. To better understand deer impacts on habitat, and promote habitat management efforts, DEC collaborated with researchers from the State University of New York College of Environmental Science and Forestry (SUNY ESF) and Cornell University to:

- model deer impacts on forest regeneration; and
- develop a simple protocol for landowners to monitor deer vegetation impacts on their property (Assessing Vegetation Impacts from Deer – AVID; <http://aviddeer.com/>).

**Resulting publications (see [Literature Cited](#) section for full citations)**

Assessing Vegetation Impacts from Deer: a rapid assessment method for evaluating deer impacts to forest vegetation (Sullivan et al., 2017)

Modelling white-tailed deer impacts on forest regeneration to inform deer management options at landscape scales (Lesser et al., 2019)

## Goal 6: Operational

Tasks associated with this goal were routine in nature and included:

- training in aging deer by tooth-wear and replacement; and
- training in chemical immobilization and the safe use of firearms for wildlife collection.

## History of Deer and Deer Management in New York

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; Figure 1).



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 ([Appendix 1](#)). Deer recolonized New York via migration from remnant populations in the Adirondacks, Vermont, Massachusetts, and 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, reinhabiting all areas of the state.

As deer populations grew in number and distribution, hunting seasons resumed incrementally until nearly all the state was open to deer hunting. Abandonment of farms

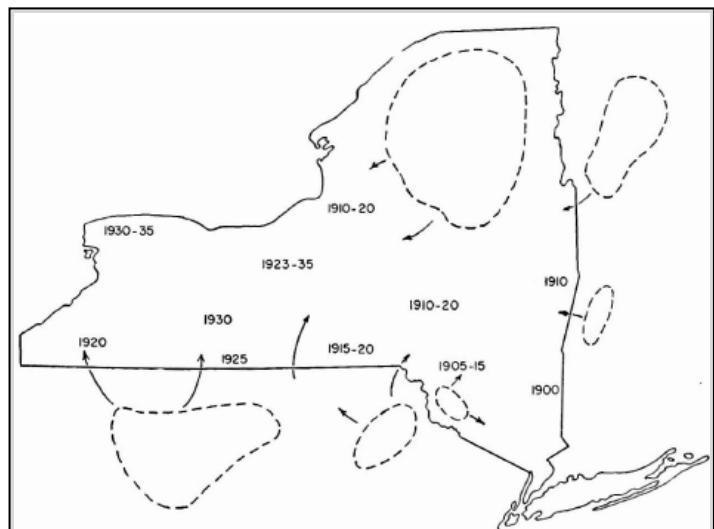
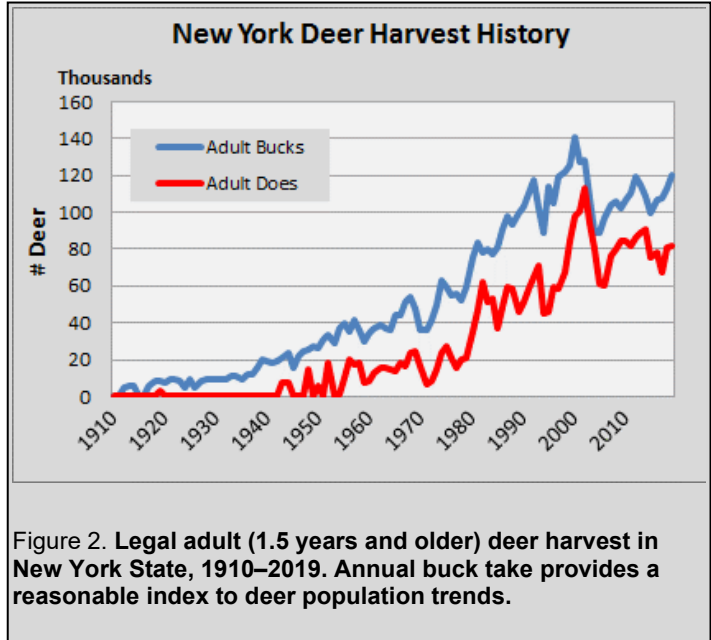
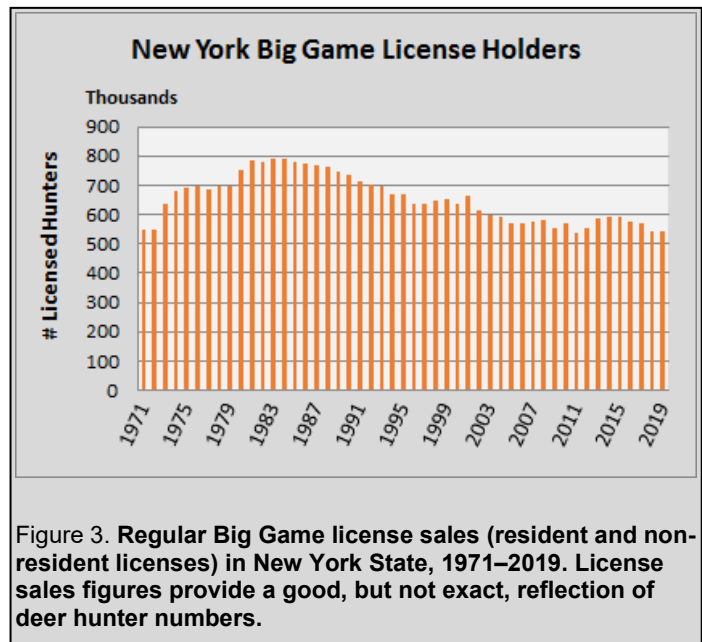


Figure 1. Major centers of deer population in 1890–1900 in New York and vicinity from which deer spread throughout the state. Dates represent approximate times that deer appeared in various parts of New York (Severinghaus and Brown, 1956).

on marginal lands led to increased early successional and young forest cover and better deer habitat throughout the state. By the 1940s, locally abundant deer populations resulted in higher levels of agricultural damage and over-browsing of winter range in some locations. Short either-sex or doe-only hunting 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 (DMPs) which are issued to individual hunters for use in specific Wildlife Management Units (WMUs). 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. After reaching a peak in the mid-1980s, hunter numbers in New York began to decline at a rate of roughly 2% per year through the early 2000s (Figure 3). Reflective of nationwide trends, the decline in hunters is understood to be driven by changing demographic factors of society, primarily increasing urbanization (Responsive Management/National Shooting Sports Foundation, 2008). Because hunting is the primary tool used by state agencies to manage deer populations, these trends present unique challenges for the future of deer management.



# 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 16). 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.



Photo courtesy of Jeb McConnell

DEC is legally mandated 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 is a fundamental challenge for deer managers. DEC has a long history of and commitment to involving the public in deer management decision making. This began in the early 1990s with the implementation of citizen task forces (CTFs), when DEC convened small groups of local stakeholders to determine population objectives for each WMU. While groundbreaking at the time, the CTF model had a limited reach and the need emerged for broader-scale public engagement. From 2014–2017, DEC collaborated with the Cornell University Center for Conservation Social Science on a pilot program to test several new methods of gathering public input (Pomeranz et al., 2014; Siemer et al., 2015; Pomeranz et al., 2017). Based on the results of the pilot program, DEC will no longer convene CTFs, but has transitioned to the use of questionnaires to understand public preferences about deer populations. Beginning in 2018, a survey ([Appendix 2](#)) was mailed to property owners throughout the state and asked respondents about:

- their interests and concerns related to deer;
- how they would like to see the deer population in their local area change in the near future (increase, decrease, remain the same); and
- how important deer management issues are to them.

Deer hunters have an inherent interest in the size of local deer populations. However, people from all sectors of society also experience the positive and negative impacts of deer and have important perspective on deer population management. Thus, use of surveys allows DEC to better understand concerns and preferences of all New Yorkers, including deer hunters and everyone else.

Survey results, in combination with data on deer impacts on forest regeneration, will guide future deer population management decisions (see detailed description in [Appendix 2](#)). In order to capture changes in deer population preferences, DEC intends to repeat the public surveys periodically and adapt management directions as necessary to fit the most recent sociological and forest regeneration data.

Deer management in New York has historically been implemented at the WMU level, which were established and modified over time to reflect local differences in land uses, human population densities, forest and soil types, climate conditions, and other factors that affect the quantity and condition of deer. Current WMUs range in size from 92 to 3,047 square miles but average only 530 square miles. At this relatively small scale, it was difficult to obtain sufficient data for analyzing and managing deer populations with a high degree of confidence. To make better use of deer population data, DEC grouped WMUs into larger units based on similarities in ecological conditions and human and deer population characteristics (Figure 4). These 23 WMU Aggregates, excluding areas where deer hunting is prohibited by statute, will be used by deer managers for the purposes of collecting and analyzing data relevant for deer population management; however, individual WMUs will remain in place for regulatory purposes and deer tag issuance.

Successful deer population management requires assessing public desires, ecological impacts, 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. Deer managers use population indices rather than an absolute measure of abundance to monitor trends in population size, condition, and impact on the

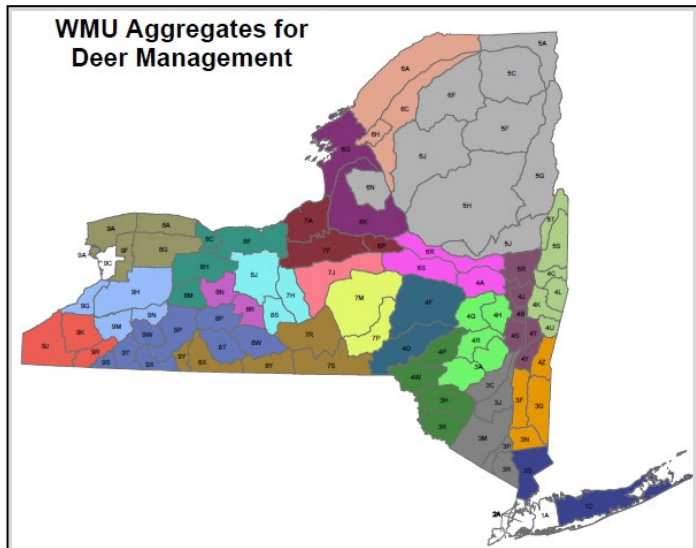


Figure 4. Wildlife Management Unit Aggregates for deer management in New York.

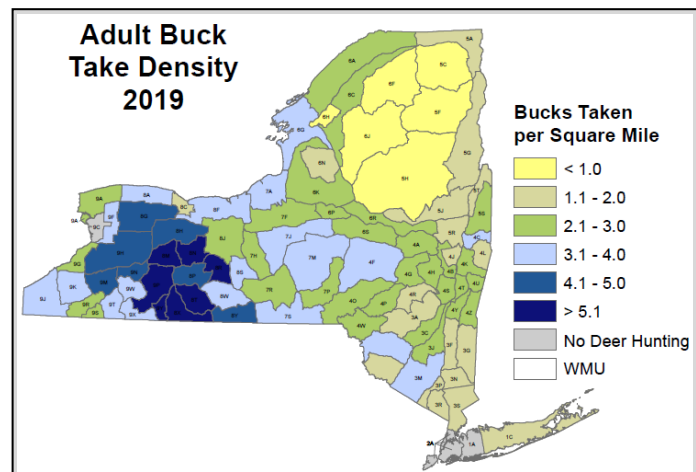


Figure 5. Harvest density of adult bucks (1.5+ years old) by Wildlife Management Unit in 2019, illustrating variation in relative population density across New York State.



Photo courtesy of Dick Thomas



environment. Together, these factors are more valuable than precise knowledge of the number of deer. In New York, DEC uses the annual buck harvest density (bucks taken per square mile, Figure 5) as an index to monitor trends in deer abundance and age and sex of harvested deer to monitor trends in population demographics. 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.

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. In portions of northern New York, deer populations are low, limited by severe winter conditions and marginal habitat quality. In many of these management units, DEC lacks statutory authority to issue DMPs (i.e., antlerless deer tags). Therefore, while not ideal, antlerless harvest in much of northern New York must currently be addressed through periodic adjustments in harvest regulations of muzzleloader hunting seasons. Through the rest of New York, DEC modifies the number of DMPs 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 data on deer-related impacts to forests and public preferences.

While this system works well most of the time, in some WMUs, particularly those in highly developed landscapes and those with very productive agriculture, the current season structure and tag system have been inadequate to effectively stabilize or reduce deer populations as needed. In these areas, DEC must create additional opportunity for antlerless harvest. If such measures continue to be ineffective for population management, DEC must then consider regulations that prioritize antlerless harvest over antlered deer harvest (e.g., earn-a-buck requirements).

Aside from hunting, deer populations are impacted by other mortality sources such as predation, deer-vehicle collisions, fawn loss to agriculture equipment, severe weather, localized outbreaks of epizootic hemorrhagic disease, and other health issues (e.g., physical injury, pneumonia).



Photo courtesy of John Major

## Value of White-Tailed Deer in New York

### **Deer-Viewing Facts <sup>a</sup>**

- 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 <sup>b, c, d</sup>**

- 540,380 deer hunters in New York
- 49.5 years, average age of hunters
- 31 years, average hunting experience
- 17.7 average days per deer hunter
- >10,150,000 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:**

<sup>A</sup> U.S. DEPT. OF INTERIOR 2008

<sup>B</sup> NYSDEC LICENSE SALES

<sup>C</sup> ENCK, STEDMAN, AND DECKER, 2011

<sup>D</sup> SOUTHWICK ASSOCIATES, 2007

Although the exact levels of mortality from each cause are generally unknown, DEC's management approach is flexible to address non-hunting-related deer mortality. DEC routinely monitors winter weather conditions and disease situations, and following significant mortality events, adjusts hunting seasons or allocations of DMPs as appropriate in the affected areas. For other mortality sources that are generally widespread and likely relatively constant from year to year (e.g., predation, deer-vehicle collisions) DEC monitors trends in sex and age ratios of harvested deer to detect variations that may be influenced by these other sources. Again, DEC modifies annual antlerless harvest as needed to accomplish the appropriate population management considering other forms of deer mortality.

In addition to population management, DEC has the responsibility of 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 ECL 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. DEC has partnered with Cornell University's College of Veterinary Medicine Animal Health Diagnostic Laboratory to create the New York State Cooperative Wildlife Health Program (WHP). DEC works through the WHP and in collaboration with the New York State Department of Agriculture and Markets (DAM) to diagnose illnesses and conduct surveillance for important wildlife diseases such as chronic wasting disease (CWD).

CWD is a fatal disease of deer, elk, and moose that poses a serious threat to wild populations nationwide. CWD is caused by an abnormally shaped protein, called a prion. Healthy deer, elk, or moose can pick up the disease by direct contact with an infected animal's body fluids or by eating contaminated sources of food or water. In 2005, DEC and DAM discovered CWD in five captive and two wild deer in Oneida County. Thankfully, DEC has found no additional cases since 2005 despite intensive sampling in the immediate area and statewide. Nonetheless, CWD remains a major threat to New York's deer herd and has the potential to impact all the benefits associated with deer in New York. As CWD continues to spread across North America, New York's deer population is at high risk for exposure to the disease. DEC is committed to pursuing strategies to minimize the risk of CWD entry and spread in New York. To that end, DEC and DAM have adopted a suite of CWD regulations and actions, including:

- restricting the importation of live deer, elk, and moose;
- restricting the importation of whole carcasses and intact heads of hunter-harvested CWD-susceptible cervids from all areas outside of New York;
- banning the intentional feeding of white-tailed deer and moose; and
- increased cooperation and enforcement by DEC and DAM.

As part of DEC and DAM's [NYS Interagency CWD Risk Minimization Plan](#) (PDF), DEC also committed to assess the risk posed by the use of products composed of urine and excreted substances from CWD-susceptible cervids. Because deer urine and other biofluids may contain CWD prions, and because commercial biofluid products lack regulatory oversight, DEC advises hunters to avoid using natural deer urine-based scent lures and recommends the possession, use, and sale of cervid biofluid products be prohibited in New York ([Appendix 3](#)).

Early detection allows the best options for management of CWD. DEC's ongoing strategic surveillance efforts include an annual weighted-sampling approach for collecting and testing hunter-harvested deer and responding to reports of sick wild deer and testing them for CWD. Learn about the [NYS CWD Surveillance Plan](#) (PDF).

Should CWD be detected in New York, aggressive action will be necessary. DEC is prepared to immediately respond by taking these measures:

- determine the scope of the outbreak by intensive removal and testing of wild deer. This may involve changes to increase hunting harvest in select WMUs and/or sharpshooting, depending on the time of year when CWD is detected;
- prevent disease movement by emergency regulations to prohibit movement of harvested deer and live captive cervids from the affected area to other portions of New York; and
- engage local communities to support disease control efforts.

Learn about the [NYS Interagency CWD Response Plan](#) (PDF).

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

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### Routine Activities

**Strategy 1.1.1:** Use hunter harvest reports and field check of harvested deer to estimate the annual legal deer harvest to  $< \pm 5\%$  with 90% confidence in each WMU Aggregate ([Appendix 4](#)).

**Strategy 1.1.2:** Annually collect sex, age, antler measurements, and other biological data as needed to monitor trends in deer condition and population dynamics by WMU Aggregate.

### Special Projects

**Strategy 1.1.3:** Evaluate deer management data to identify opportunities to improve efficiency of data collection and quality of information.

## Objective 1.2. Identify population objectives within each WMU Aggregate and adjust harvest of antlerless deer to achieve desired deer population trajectories.

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### Routine Activities

**Strategy 1.2.1:** Use input from public surveys and a deer-forest impact index ([Goal 5: Habitat](#)) to establish objectives for deer population change within each WMU aggregate ([Appendix 2](#)).

**Strategy 1.2.2:** Set target allocations of DMPs each year and/or periodically modify special seasons to achieve the desired deer population change in each WMU ([Appendix 5](#)).

### Special Projects

**Strategy 1.2.3:** Modify DEC's licensing system to allow more flexibility in the issuance of DMPs.

## Objective 1.3. Conduct scientific research to support deer management.

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### Routine Activities

**Strategy 1.3.1:** Develop DEC projects, as needed, 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. Establish formal agreements with universities and non-governmental organizations, when necessary, to accomplish such work.

## Objective 1.4. Monitor wild deer for disease incidence and prevalence and reduce the potential for non-endemic disease introduction and spread.

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### Routine Activities

**Strategy 1.4.1:** Understand deer-related diseases that may threaten deer populations, the livestock industry, or human health. Maintain a response approach to minimize those threats and prevent establishment of non-endemic diseases in New York.

**Strategy 1.4.2:** Sample New York's wild deer herd for disease and investigate unique incidences of deer exhibiting clinical symptoms.

**Strategy 1.4.3:** Work with New York State DAM to implement actions outlined in the New York State Interagency CWD Risk Minimization Plan.

**Strategy 1.4.4:** Maintain and enforce the prohibition on the feeding of wild white-tailed deer.

**Strategy 1.4.5:** Remove escaped captive cervids from the New York landscape to protect wild deer, moose, and human health and safety.

### Special Projects

**Strategy 1.4.6:** 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.

## Goal 2: Hunting and Recreation

Promote the benefits of deer hunting and enhance its usefulness as a management tool in New York.

Deer hunting is a long-standing tradition in New York and an important part of many New Yorkers' outdoor heritage. Deer hunting was essential for the survival of Native American groups in the Northeast and played an integral role in sustaining early European settlements here. Today, deer hunting continues to be an important activity for many 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 DEC

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 underpins wildlife management 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 rulemaking with public involvement rather than market pressures, wealth, social status, or land ownership. 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 Conservation.

A strong majority (78%) of Americans support legal hunting while only 16% disapprove of hunting (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, but 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



Photo courtesy of Sharon Tabor

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 safe and ethical hunting practices through education programs for new and seasoned hunters, as well as inform the public about the strong safety records of New York's hunters.

In rural New York, the concept and practice of deer hunting are well ingrained. The majority of New York hunters hail from rural areas (Lauber and Brown, 2000; Enck et al., 2011). However, 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. 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 contributed to the 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.



Photo courtesy of Jeremy Hurst

Concurrent with declining numbers of hunters, access to privately owned huntable land has also decreased in New York. In 1991, over 60% of all private lands in upstate New York were posted against trespass and hunting without permission, 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 29 years, and this has strong implications for deer management efficacy. Perhaps most troubling, lands that receive only nominal hunting pressure or that are closed to hunting completely 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 overabundant deer populations that negatively impact forests, create problems for homeowners and motorists, and may decrease the value attributed to deer by the affected public.

Thus, local and state land and deer managers are and should be involved in efforts to enhance land access for hunting, particularly as they may increase management effectiveness. However, substantial improvements to hunter access will require cooperation of New York hunters and hunting organizations as well as communities and citizens concerned about deer impacts, and likely will necessitate changes to state laws and local ordinances. Efforts to inform landowners about the ecological value and social benefits of deer hunting, and the laws related to land posting and landowner liability, may convince additional property owners to allow deer hunting on their lands. 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 Board](#), expand conservation easements, acquire new public lands through strategic open-space planning,

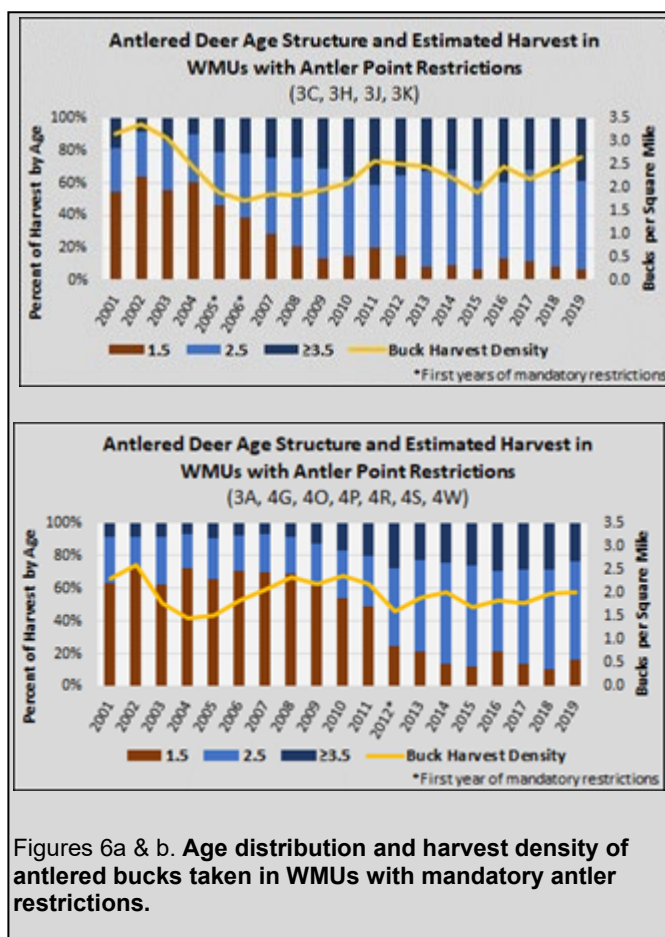
and develop new incentive-based access programs. Hunters, too, can preserve existing access by respecting landowner rights and interests and by recognizing that permission is needed to hunt private land, whether or not it is posted.

Harvest of antlerless deer will remain a priority in this plan. Flexibility in the regulations pertaining to antlerless harvest throughout the state must be fluid so changes can be made whenever necessary. Likewise, the door must remain open to new and novel approaches to antlerless harvest where deer numbers exceed public desire and current harvest levels are inadequate. In some areas of the Northern Zone, this may include modifying muzzleloader seasons (e.g., opening or closing seasons, limiting take to buck-only or doe-only, or setting antlerless bag limits) and seeking legislative authority to issue DMPs in additional WMUs to address changing deer populations; in the Southern Zone, increased antlerless harvest may entail an early firearms season, expansion of late seasons, increased antlerless bag limits, broader implementation of the DMAP program, and creation of an urban season framework.

Many hunters are motivated in part by the opportunity to take older, larger antlered bucks. For decades, hunters in New York were accustomed to taking mostly small-bodied, small-antlered yearling bucks (1.5 years old), which

constituted 65–75% of the annual antlered buck harvest. Dissatisfaction of some hunters with this pattern led DEC to adopt mandatory antler point restrictions, which limit harvest of yearling bucks, in 11 WMUs in southeastern New York between 2005 and 2012. As expected, the mandatory antler restriction reduced the proportion of 1.5-year old bucks in the harvest from >60% to <20%, and at the same time, the proportion of older bucks ( $\geq 2.5$  years old) in the harvest increased from 40% to 80%. The restriction resulted in an immediate decrease in antlered harvest density in all units, but buck harvest returned to pre-antler restriction levels in units where DEC managed for the overall population to grow (Figures 6a and 6b).

In 2016, following an assessment of hunter values and a scientific decision-making process that considered potential expansion of mandatory antler point restriction programs or other hunting strategies, DEC found that a non-regulatory, educational approach would better balance hunters' desires for older bucks and their freedom of choice. DEC initiated a campaign to encourage hunters broadly to voluntarily [Let Young Bucks Go and Watch Them Grow](#). This effort built upon a movement that was already occurring in New York and nationally, and the shift from yearlings to older bucks in the annual harvest has accelerated.



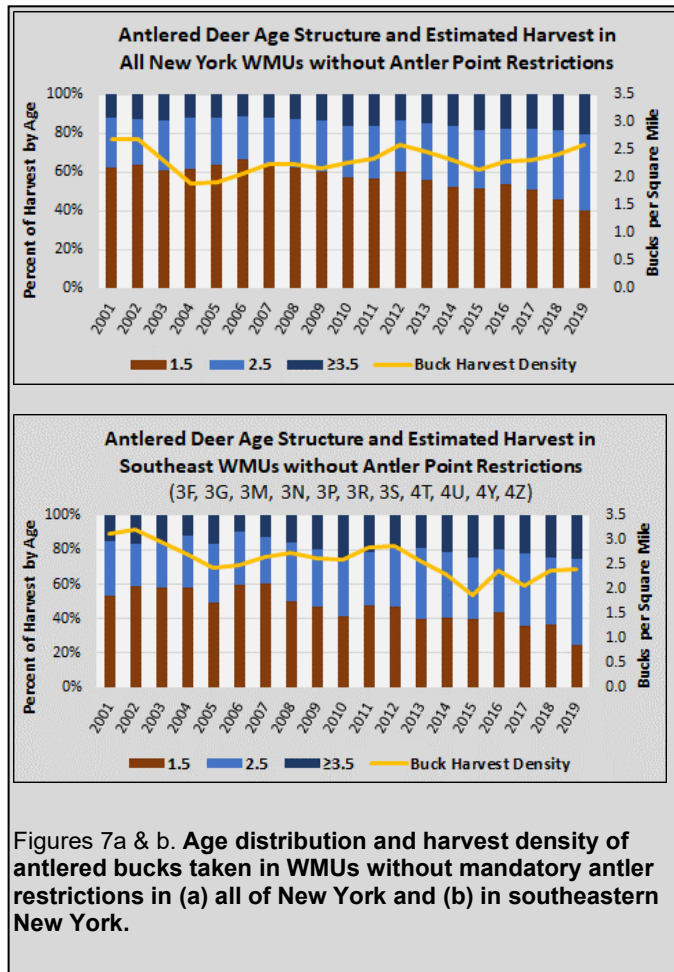
Figures 6a & b. **Age distribution and harvest density of antlered bucks taken in WMUs with mandatory antler restrictions.**

Now, in WMUs across the state without mandatory restrictions, hunters are voluntarily passing on young bucks more than ever before and enjoying the benefits. Statewide, buck harvest has shifted from >60% yearlings to 60% 2.5-year-old and older bucks, through the voluntary choice of hunters (Figure 7a). Notably, harvest patterns in several WMUs in southeastern New York without antler restrictions demonstrate that the voluntary choice of hunters can result in very low yearling buck harvest (25% of total buck harvest; Figure 7b). In these units, 75% of the bucks taken by hunters are now 2.5 years old or older, suggesting voluntary efforts may be nearly as effective in shifting harvest age structure as mandated restrictions. As the portion of yearling bucks in the harvest declines elsewhere through voluntary choice, this plan recognizes that DEC should continue to evaluate whether the antler restriction regulations are consistent with hunter interests and values and deer management needs.

Additionally, this plan proposes to expand legal deer hunting hours to cover a longer period of daylight, including the dawn and dusk periods when deer are most active. Currently, deer hunting in New York is lawful only between the meteorologically defined times of sunrise and sunset despite the fact that ambient light conditions typically extend 30 minutes or more beyond the technical sunrise and sunset. New York has the most restrictive deer hunting hours in the United States. All other states allow deer hunting beginning 30 minutes before sunrise or earlier, or simply specify daylight hours, and 46 of 50 states allow deer hunting until some period (mostly 30 minutes) after sunset. Other states report similarly positive safety experiences of hunters and non-hunters during these periods as during full daylight hours.

Finally, DEC recognizes that deer hunting activities and deer management decisions may impact other wildlife, hunters of other game species, landowners, and non-hunting wildlife enthusiasts. For example, the traditional use of lead-based ammunition by deer hunters can have toxic effects on other wildlife that may inadvertently consume lead fragments when feeding on lead-contaminated gut piles or unrecovered carcasses. Non-lead ammunition is better for people and better for wildlife. The Wildlife Society (2017) and Association of Fish and Wildlife Agencies (2010) have adopted position statements advocating for action to address impacts of lead-based ammunition on wildlife health. DEC will continue to educate and encourage deer hunters on [the availability and benefits of using non-lead ammunition and will work with partner organizations and stakeholders to identify possible strategies to reduce risks posed by lead ammunition](#).

Additionally, DEC routinely hears from the non-deer-hunting public who express their thoughts about deer hunting and deer management, and this input is important for DEC to make informed decisions.





Much input comes unsolicited through general correspondence with DEC staff, but DEC periodically conducts surveys to understand the public's interests and concerns related to deer and deer-related impacts. Also, public review periods for proposed regulatory actions provide focused comments to drive specific decision-making processes. Because understanding diverse perspectives improves our ability to manage responsively toward public interests, DEC will continue to gather input from non-hunters and other wildlife user groups when making deer management decisions.



## Objective 2.1. Promote regulated hunting as a safe, enjoyable, and ethical tool to manage deer populations and opportunity for the public to acquire venison. Contribute to efforts to improve hunter participation, recruitment, retention, and satisfaction.

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### Routine Activities

**Strategy 2.1.1:** Emphasize recreational hunting as the most cost-effective option for controlling deer populations at the landscape scale.

**Strategy 2.1.2:** 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 2.1.3:** Contribute to DEC efforts to enhance skills and effectiveness of existing hunters and engage new hunters by improving safety education courses and implementing additional education programs as needed to encourage hunter safety, ethical behavior, and success.

**Strategy 2.1.4:** Ensure that any new deer hunting regulations or modifications of existing regulations promote safe and ethical hunter behavior and equitable opportunity. Evaluate legislative options and policies using the same criteria.

**Strategy 2.1.5:** Encourage use of non-lead ammunition by New York deer hunters.

## Objective 2.2. Establish deer hunting seasons, regulations, and programs that are effective for deer population management.

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### Routine Activities

**Strategy 2.2.1:** Monitor and evaluate deer hunting seasons and programs relative to deer population management objectives and the interests of hunters and the public. Recommend modifications as needed.

### Special Projects

**Strategy 2.2.2:** Incorporate a firearms deer hunting opportunity for youth in Suffolk County.

**Strategy 2.2.3:** Modify the Deer Management Focus Area to be a statewide urban/suburban hunt program for which municipalities can opt-in to expanded antlerless hunting opportunities (e.g., longer seasons and/or additional antlerless tags).

**Strategy 2.2.4:** Establish a firearms season for antlerless deer in mid-September in specific WMUs where existing harvests are inadequate to achieve population management objectives.

**Strategy 2.2.5:** Establish a January deer season in Westchester County.

**Strategy 2.2.6:** Establish a late bow and muzzleloader season between Christmas and New Year's in the Southern Zone.

**Strategy 2.2.7:** Assess either-sex hunting opportunities in Northern Zone WMUs and modify to equitably distribute antlerless harvest and achieve desired harvest intensity.

**Strategy 2.2.8:** Extend daily deer hunting hours to 30 minutes before sunrise and 30 minutes after sunset, consistent with most legal hunting hours around the country.

## Objective 2.3: Maintain and increase opportunity for hunters to see and take older bucks while preserving hunters' freedom of choice.

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### Routine Activities

**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.

### Special Projects

**Strategy 2.3.4:** Assess the preexisting mandatory antler restriction program for consistency with hunter values and impacts on population management and recommend changes if warranted.

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

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### Routine Activities

**Strategy 2.4.1:** Maintain a current understanding of the impediments to private land access for deer hunting through periodic public surveys and solicitation of comments.

**Strategy 2.4.2:** Explore the feasibility of programs to improve private land access for deer hunting and assist with implementation of programs deemed to be the most effective.

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

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

### Routine Activities

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

## 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 coexist 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 those affected by deer.

While deer have many positive attributes, when they cause damage, it can be severe. In 2002, New York farmers estimated their deer-related crop damage losses to be approximately \$59 million, and about one-quarter of farmers indicated that deer damage was a significant contributing factor affecting the profits of their farm (Brown et al., 2004). Deer-vehicle collisions are another major type of deer-related damage in New York (Figure 8). They are a substantial concern for motorists, particularly in suburban areas with abundant deer populations. The average total cost of each deer-vehicle collision has been estimated to be more than \$6,600 (Huijser et al., 2009).

Ecological damage caused by deer is receiving increasing attention as awareness spreads of the negative impacts of high deer densities on forested ecosystems and the loss of ecological



Photo courtesy of Dick Thomas

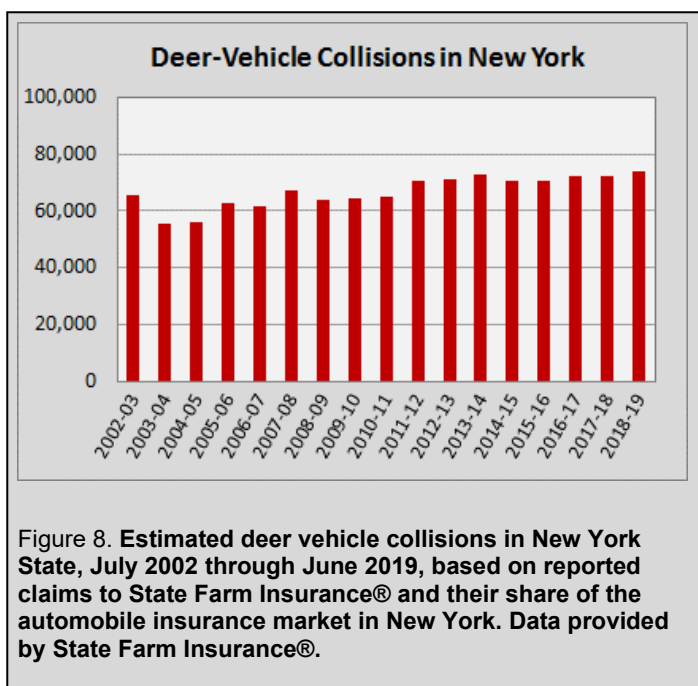
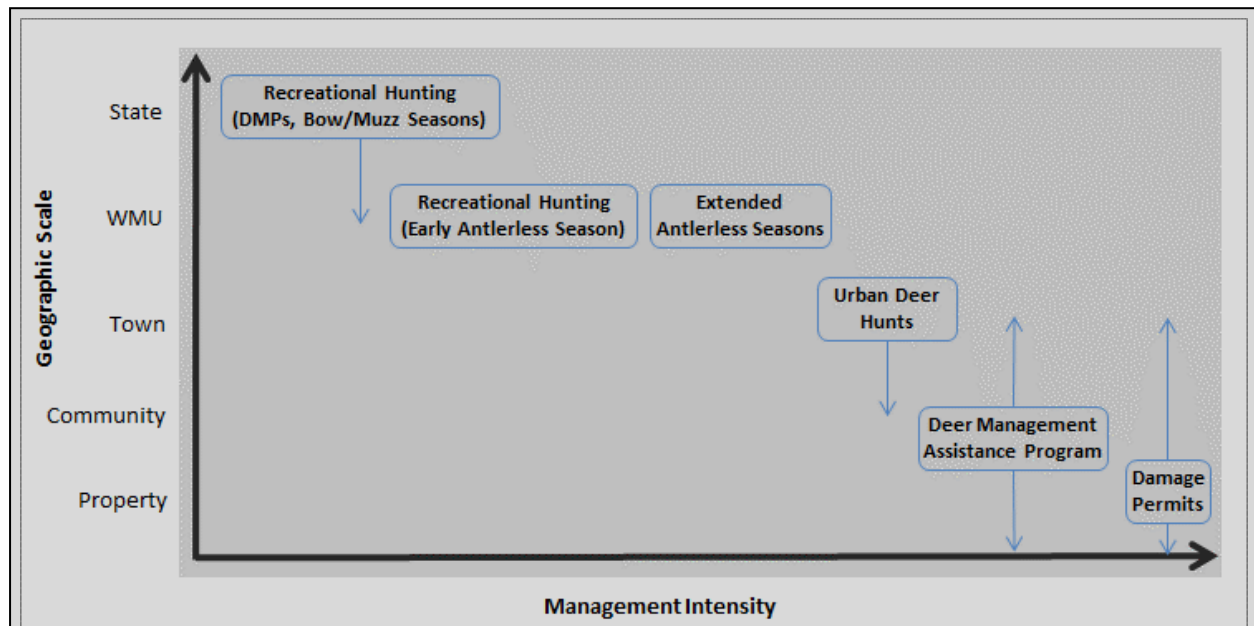


Figure 8. Estimated deer vehicle collisions in New York State, July 2002 through June 2019, based on reported claims to State Farm Insurance® and their share of the automobile insurance market in New York. Data provided by State Farm Insurance®.

services of those ecosystems. An overabundance of deer results in profound and persistent changes to ecosystem structure and function (White, 2012; Nuttle et al., 2014; see [www.dec.ny.gov/animals/104911.html](http://www.dec.ny.gov/animals/104911.html)). Additionally, many parts of New York are considered high-risk areas for human infection with Lyme disease (Diuk-Wasser et al., 2012), based on the density of infected black-legged ticks (*Ixodes scapularis*). As the primary food source for adult female black-legged ticks, abundant deer populations may contribute to elevated tick densities.

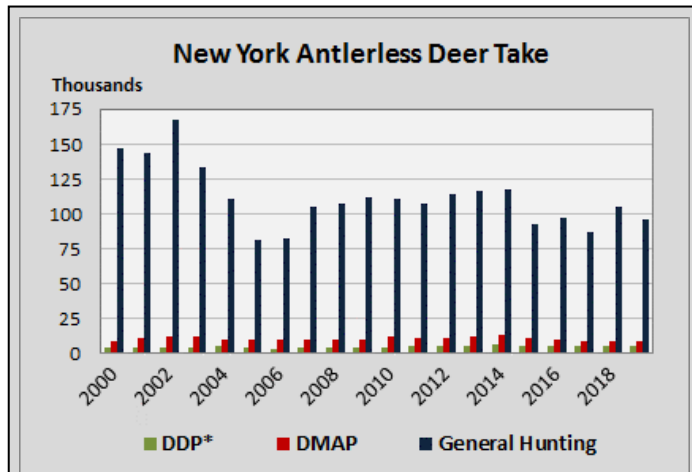
Each year, DEC responds to countless inquiries and complaints about nuisance and damaging deer or situations of deer overabundance (Appendix 6), and sometimes these contacts can be satisfied with technical advice alone. However, protective actions that landowners can take on their own are often not adequate to reduce damage. In many cases, deer population reduction is necessary, and DEC's primary method of controlling deer density continues to be the harvest of antlerless deer during the fall hunting seasons. DEC has structured a tiered system of harvest management to provide meaningful scales of management intensity to meet varying stakeholder objectives (Figure 9).

Regulated hunting as a tool for reducing deer-related damage generally works best over large areas or when damage is not severe. For intensive local site control during the hunting seasons, qualifying landowners can receive Deer Management Assistance Program (DMAP) permits. These permits provide antlerless tags for use on specified properties. In addition to addressing damage situations, DMAP facilitates custom deer management efforts by hunter-landowners who want to remove more does to change their buck harvest opportunities. In situations where significant crop damage occurs outside of normal hunting time frames or regulated hunting doesn't remove enough deer to reduce damage to a sustainable level, Deer Damage Permits (DDPs) are an additional option with more flexibility. Most DDPs are exclusively for take of antlerless deer, and they often authorize methods that are not legal for hunters, like shooting at night with lights and taking deer outside of hunting seasons. DMAP and DDPs are designed for local effect; impact of these permits on regional deer populations is minor compared to overall harvest of antlerless deer by hunters (Figure 10).

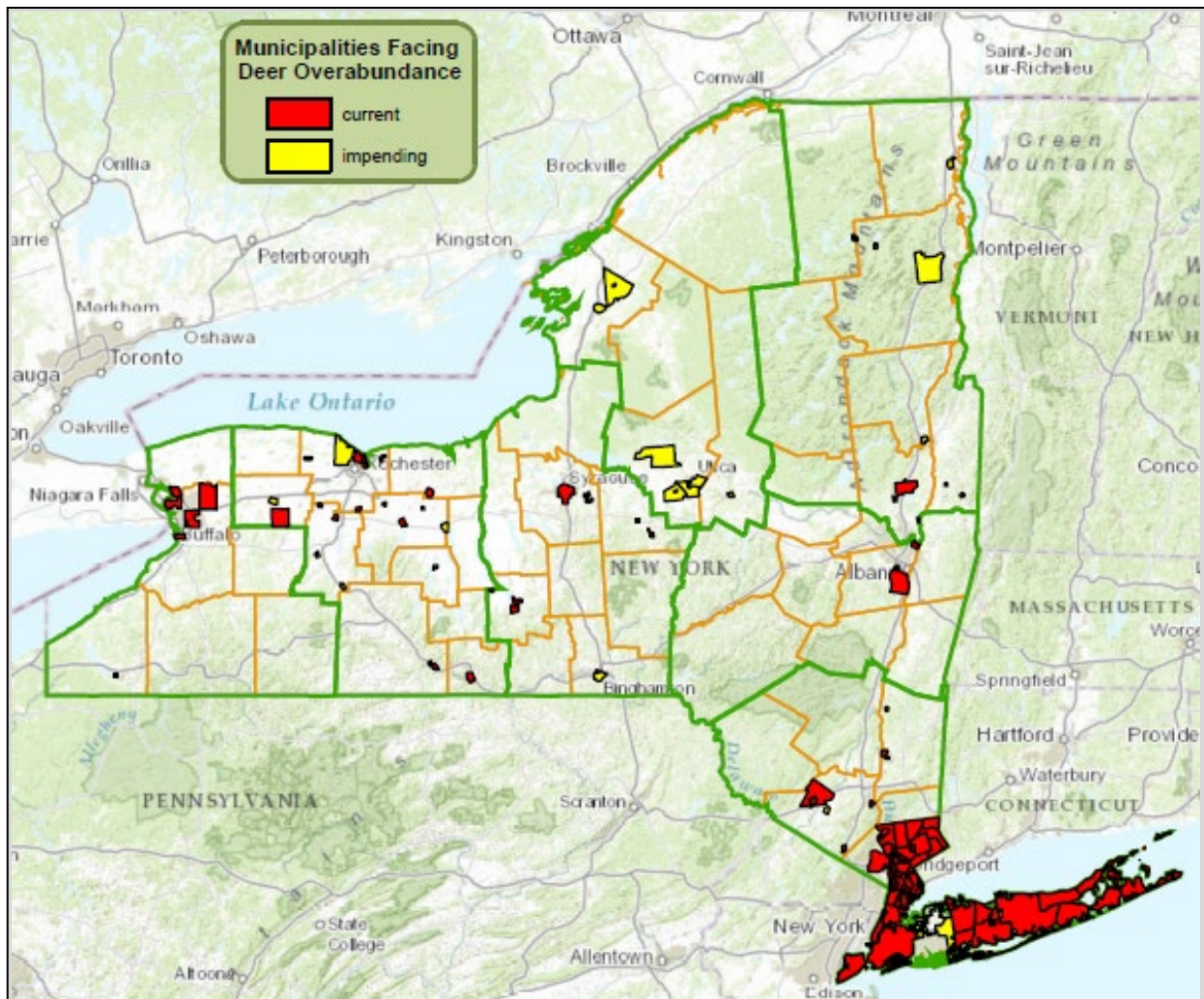


**Figure 9.** Conceptual framework of deer harvest management in New York across varying degrees of geographic scale and management intensity. Note that some programs have applicability at multiple geographic levels. Early antlerless seasons and urban hunt programs are discussed in Objective 2.2.

Locally abundant deer populations in urban, suburban, or otherwise developed areas present unique management challenges (Figure 11). Residential communities with low to medium housing density generally provide excellent deer habitat and foster high deer population growth. In communities that do not allow hunting or are not engaged in other forms of intentional deer management, most deer mortalities result from deer-vehicle collisions. This unintentional deer mortality is ineffective for population control, is unsafe and costly for the public, and is inhumane for the deer as many animals are not killed instantly. Vehicle strikes do not produce a high enough mortality rate to



**Figure 10.** Trend in antlerless deer harvest via Deer Damage Permits (DDPs) and Deer Management Assistance Program (DMAP) permits and general



**Figure 11.** Municipalities in New York State with ongoing or impending challenges with deer overabundance.

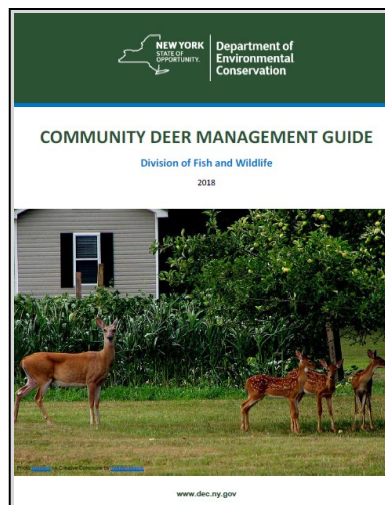
offset the high reproductive rate of deer. The simplest and least expensive way for communities to control local deer populations is to act before deer populations become overabundant and impacts are severe by allowing regulated hunting to occur on public and private lands within their boundaries. This requires that local codes and ordinances do not preclude otherwise safe and lawful use of firearms, bows, or crossbows for hunting. Many communities are recognizing this and taking steps to facilitate hunting and/or additional forms of management. Unfortunately, most communities wait to act until the local deer population has become severely overabundant, requiring more intense and costly population control measures.

In communities with overabundant deer populations, general deer hunting may not be adequate to reduce excessive impacts.

Communities may intensify deer removal by actively facilitating controlled hunts during the regulated hunting seasons with DMAP, enlisting volunteers or professionals as sharpshooters for a deer cull via a DDP, or developing a program that strategically integrates lethal control in some areas with non-lethal surgical sterilization ([Appendix 7](#)) in other portions of the community where lethal control may not be feasible. Communities may also seek to directly manage other deer-related impacts by modifying vehicle speed limits and expanding roadway buffers, planting species that are less palatable to deer, and using exclusionary fences on high-value commercial or natural resource areas.

DEC does not fund the implementation of community deer removal programs or non-lethal management actions, but DEC provides technical assistance to communities seeking to develop such programs. Our [Community Deer Management Guide](#) helps communities work through the process of making decisions on deer management and developing plans for addressing the problems they're experiencing. DEC also collaborated with Cornell University on the development of the Community Deer Advisor website (<https://deeradvisor.dnr.cornell.edu>), which contains links to many additional helpful resources. DEC biologists routinely give educational presentations to community officials and residents and, if desired, can serve in an advisory capacity on local committees tasked with developing recommendations and strategies for community action.

Communities and landowners desiring to reduce risks of tick-borne diseases may best focus on efforts to increase tick-bite prevention and techniques that directly reduce tick densities ([https://www.cdc.gov/ticks/avoid/in\\_the\\_yard.html](https://www.cdc.gov/ticks/avoid/in_the_yard.html)). Reducing deer populations to very low levels can reduce tick densities (Kugeler et al., 2016) and probably Lyme disease rates (Kilpatrick et al., 2014). However, such intense deer population reductions may not be achievable or acceptable in many communities, and less drastic reductions may not lower the chances of human Lyme infection (Jordan et al., 2007; Kugeler et al., 2016). With appropriate permitting, communities may consider applying pesticide to the ground, vegetation, or with devices to treat small mammals with pesticide as effective tick control. Additionally, treating deer with pesticide via devices called 4-Posters™ can control tick numbers in the immediate vicinity of the devices under certain circumstances (Wong et al., 2017). 4-Posters™ are bait stations designed to attract deer and treat them with permethrin while they are eating the bait. Because the constant availability of extra food for deer and other animals can lead to many negative consequences (e.g., increased presence of nuisance animals, increased risk of deer-vehicle collisions, increased deer populations, ecological and residential damage), communities and landowners wishing to



use 4-Posters™ must apply to DEC for a [License to Use 4-Poster™ Devices](#) and implement deer population control programs to prevent the negative impacts.

In many ways, effective community-based deer management is hampered by constraining state and local laws that were established when New York's deer population was low and deer-related conflicts were rare (see [Appendix 8](#) and DEC's 2018 report to the New York Senate and Assembly, [Deer Management in Urban and Suburban New York](#)). Nevertheless, this plan contains several new initiatives designed to help communities address their deer-related problems. To make hunting a more useful tool for communities, DEC plans to create a statewide, extended urban/suburban antlerless season for which municipalities can apply to participate ([Strategy 2.2.2](#)). This type of season, which already exists in some other states, provides greater opportunities for hunters and facilitates more effective population reduction. DEC intends to explore the possibility of offering small grants to communities to help cover the costs of deer management planning. DEC also will explore development of a training workshop that could be offered to hunters in communities that are considering using hunting as a deer management strategy. The workshop would cover the special concerns and constraints inherent to hunting in developed areas and would be designed to prepare hunters to function more effectively in those settings.

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

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### **Routine Activities**

**Strategy 3.1.1:** Provide technical assistance on various lethal and non-lethal approaches to management of deer-related damage to agriculture, forests, and residential interests.

**Strategy 3.1.2:** 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 3.1.3:** Continue to offer and improve the Deer Damage Permit (DDP) program to mitigate acute deer-related damage and increase public tolerance for deer on the landscape.

**Strategy 3.1.4:** Enforce compliance by DMAP-permit and DDP recipients with permit conditions.

**Strategy 3.1.5:** Maintain and update DEC's guidelines and procedures for handling deer damage complaints and issuing DMAP permits or DDPs.

**Strategy 3.1.6:** Work with DEC's Special Licenses Unit to review applications and oversee licenses for 4-Poster deer-feeding devices so as to minimize the potential negative impacts on local ecosystems, deer behavior and population abundance, and public safety.

### **Special Projects**

**Strategy 3.1.7:** Work with DMAP permit recipients to evaluate program effectiveness for meeting their goals. For DMAP permits that require a management plan (i.e., forest regeneration, municipalities, significant natural communities, and custom deer management), develop standard forms for submission of monitoring data (e.g., regeneration success, browse impact, deer weights, ages, or antler measurements) in addition to general harvest reports.

## Objective 3.2. Facilitate community-based deer management to address locally abundant deer populations.

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### Routine Activities

**Strategy 3.2.1:** Work with municipal officials and residents in urban and suburban communities to increase understanding of deer-related problems, clarify community desires for local deer populations, and identify deer management strategies that suit the community's needs.

**Strategy 3.2.2:** Encourage and assist landowners, land managers, municipalities, or organizations to establish controlled hunting programs when appropriate.

**Strategy 3.2.3:** Maintain a current understanding of the potential usefulness of fertility control and other emerging or experimental management techniques (Appendix 7); facilitate well-designed research to develop or test such techniques.

### Special Projects

**Strategy 3.2.4:** Explore creation of a small-grants program to assist communities in developing deer management programs.

**Strategy 3.2.5:** Develop and offer, in communities that are considering or embarking on deer management, a hunter-training workshop focused on approaches, behavior, and skills that may enable hunters to function more effectively in urban and suburban residential settings.

## Goal 4: Education and Communication

Foster understanding and communication about deer ecology, management, economic aspects, and recreational opportunities while enhancing DEC'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 and management, and associated opportunities for people to enjoy the myriad benefits that deer provide to New Yorkers.

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.

Hunters play a major role in deer population management, and DEC staff are routinely invited to meetings and events of various hunting organizations to speak about relevant deer management and deer hunting issues. DEC staff also periodically contribute to outdoor-related publications and newspapers, which affords additional opportunities to educate hunters on important management topics. While developing an informed public, including hunters and wildlife viewers, is essential, DEC also prioritizes obtaining routine



feedback from these groups and the broader public, giving all New Yorkers opportunity to engage 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 public participation processes are inclusive, providing all beneficiaries an opportunity to express their values and interests regarding deer management decisions.**

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#### **Routine Activities**

**Strategy 4.1.1:** Conduct periodic surveys of the public and hunters to assess current 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, press releases, on the DEC website and social media sites, and in the Environmental Notice Bulletin.

### **Objective 4.2. Increase public awareness of deer biology, deer management, impacts associated with deer populations, the safe and ethical practice of regulated hunting, and the benefits of hunting for obtaining locally sourced meat.**

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#### **Routine Activities**

**Strategy 4.2.1:** Provide press releases, e-newsletters, and social media content covering subjects related to deer management.

**Strategy 4.2.2:** Host or participate in meetings, events, and webinars with local and state hunting groups, conservation or civic organizations, or the general public to provide information and gather input about the positive social, economic, and ecological impacts of deer hunting and the negative social, economic, and ecological impacts of overabundant deer populations.

#### **Special Projects**

**Strategy 4.2.3:** Prepare a Conservationist for Kids issue or Junior Naturalist Journal specific to deer biology and management and the social and ecological benefits of hunting.

## **Goal 5: Deer Habitat**

**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.

The extent of deer impacts on forests reflects the relationship of deer abundance and forage availability, such that 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. But, 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). Chronic loss of forest seedlings reduces the carbon sequestration capacity of healthy forests and compromises commercial value of private and industrial forests.

Areas heavily impacted by deer are typified by clear browse lines and reduced diversity of tree seedlings and wildflowers and lack much of the understory vegetation up to the height deer can reach (Figures 12 and 13). 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 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 green spaces), but detrimental deer impacts are also evident across a



**Figure 12.** Browse line on Stissing Mountain, Dutchess County. Photo courtesy of Tom Rawinski.



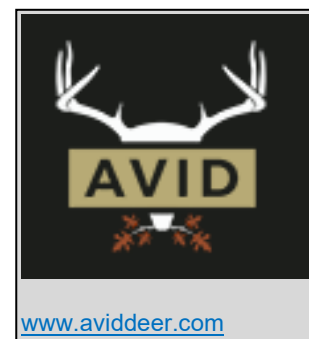
**Figure 13.** Deer-damaged forest in Rhinebeck, Dutchess County. Photo courtesy of Tom Rawinski.

range of deer densities and forest habitats. Foresters practicing in New York estimated that forest regeneration, in stands opened up for regeneration of desirable timber species, was moderately or highly successful only 30% of the time. However, the lack of interest or unwillingness of landowners to implement timber stand improvement activities or other measures to control less desirable tree species was also considered a contributing factor to poor regeneration success of desirable timber species (Connelly et al., 2010). Regeneration success is influenced by abiotic site factors (e.g., soil, moisture, and light conditions), abundance of invasive species or commercially undesirable tree species, and past silvicultural practice, but the impacts of excessive browsing by deer can exacerbate other challenges and impede regeneration even in well-managed forest stands.

The relationship between deer abundance and impact levels will vary among forests depending on forest type, site quality, stand history, stand age, and landscape context (proximity of alternative food sources). Therefore, 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. In the past, DEC conducted routine assessments of browse impact in winter concentration areas (Doig, 1968; Dickinson 1986) and used these data to inform recommendations for deer population change. This method isn't suitable for statewide application. WMU-Aggregate-scale assessment of deer impacts on forests and integration of those data into the deer harvest quota-setting process is, therefore, a critical need for future deer management in New York.

To assess forest regeneration and deer impacts within each WMU Aggregate, DEC will use a multistep process ([Appendix 2](#)) that first involves mapping the level of regeneration debt, or mismatch between the species composition or abundance of the forest canopy and understory (Miller and McGill, 2019). Then, in areas identified as having unacceptable forest regeneration, DEC will apply a model that indicates areas where deer are a principal factor limiting regeneration (Lesser et al., 2019). This combination of regeneration debt analysis and deer browse impact modeling allows managers to identify parts of the state where deer browsing is threatening forest sustainability and where deer populations should be reduced.

To help forest owners understand the effects deer are having on their property and provide additional data for deer management decision-making, DEC worked with the Cornell University Department of Natural Resources and SUNY ESF to develop a vegetation monitoring protocol called AVID, which stands for Assessing Vegetation Impacts from Deer. AVID is an easy-to-use method for volunteers, foresters, landowners, and others to monitor deer impacts on forests. It focuses on specific wildflower and tree species that are eaten by deer in New York. The AVID website and mobile app guide users through laying out monitoring plots, plant identification, and data collection. Within the plots, individual plants of the focal species are counted, marked, and measured. Measuring these same individuals each year will show whether browsing pressure from deer is changing over time, and may help communities, landowners, and managers determine the success of past management decisions and make appropriate changes in local deer abundance moving forward. Deer and forest managers expect that increased use of AVID will provide valuable data of deer impacts within each WMU Aggregate, yielding an additional metric to inform deer population management decisions.



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 effects. 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 containing native grasses and forbs. Habitat improvement should be encouraged, where possible, throughout New York. On State-owned forest lands, DEC conducts habitat improvements on a limited basis. 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 forest land is deteriorating in quality as deer habitat. However, DEC launched the Young Forest Initiative ([www.dec.ny.gov/outdoor/104218.html](http://www.dec.ny.gov/outdoor/104218.html)) on State-owned Wildlife Management Areas (WMAs) in 2015, with the goal of considerably increasing young forest habitat on WMAs across the state to benefit a multitude of wildlife species (Figure 14).

Nevertheless, because more than 80% of New York's nearly 18.6 million acres of forest are held in private ownership, private landowners have a 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 ([www.dec.ny.gov/lands/4972.html](http://www.dec.ny.gov/lands/4972.html)) and federal programs ([www.fsa.usda.gov/programs-and-services/conservation-programs](http://www.fsa.usda.gov/programs-and-services/conservation-programs)) provide direction and financial incentive to landowners who practice sustainable forestry, land conservation, and habitat improvements to benefit wildlife. DEC will promote greater awareness and participation in these programs to improve private land value as deer habitat.



**Figure 14. Seed tree cut to stimulate young forest growth at Mongaup Valley WMA. Photo by Malcolm Grant, DEC.**

## **Objective 5.1. Improve understanding of deer-related impacts on forested ecosystems to support deer management that fosters sustainable forest habitats.**

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### **Routine Activities**

**Strategy 5.1.1:** Update the deer-forest impact index (Appendix 2) every five years to inform population management decisions within each WMU aggregate by reassessing the level of regeneration debt coupled with predicted outcomes of reduced deer abundance on seedling abundance.

## Special Projects

**Strategy 5.1.2:** Promote the use of the AVID protocol to public land managers and private landowners, particularly where forest regeneration is vulnerable or not acceptable, and use AVID data to inform deer population management decisions.

**Strategy 5.1.3:** Evaluate the sensitivity of the regeneration debt index and the AVID protocol to changes in deer abundance.

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

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### Routine Activities

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

**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, and develop materials to aid in outreach efforts.

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

## 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. Maintaining a group of trained staff able to dedicate time to deer management is critical.

In New York, deer management, and most wildlife management, is funded principally by sportspersons through the New York State Conservation Fund and the U.S Fish and 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 revenues and miscellaneous other fees and fines collected by DEC's Division of Fish and Wildlife. 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. A broader funding base would more effectively ensure that adequate resources are available to conserve and manage deer.

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, retention, and reactivation 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.

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### Routine Activities

**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 robust data, and maintain staff capacity and expertise to effectively manage and analyze deer-related 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 Canadian provinces.

## Objective 6.2. Maintain effective communication within DEC on issues related to deer management.

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### Routine Activities

**Strategy 6.2.1:** Review proposed laws that would affect deer management and deer hunting and provide position statements to DEC administrators. Identify statutes that constrain effective and efficient deer management and provide recommended modifications (Appendix 8).

**Strategy 6.2.2:** Deer program managers will work with DEC's Legislative Affairs office to seek opportunities to engage elected officials on deer management-related issues.

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## Informational Resources

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### New York-Specific Resources

DEC Deer Management Program

[www.dec.ny.gov/animals/7211.html](http://www.dec.ny.gov/animals/7211.html)

Deer Hunting

[www.dec.ny.gov/outdoor/7857.html](http://www.dec.ny.gov/outdoor/7857.html)

Deer Harvest Reporting and Harvest Calculation

[www.dec.ny.gov/outdoor/47738.html](http://www.dec.ny.gov/outdoor/47738.html)

Annual and Historic Deer Harvests

[www.dec.ny.gov/outdoor/42232.html](http://www.dec.ny.gov/outdoor/42232.html)

DMP Quota Setting and Permit Selection

[www.dec.ny.gov/outdoor/47743.html](http://www.dec.ny.gov/outdoor/47743.html)

What New York is Doing About Chronic Wasting Disease

[www.dec.ny.gov/docs/wildlife\\_pdf/cwdbooklet2019.pdf](http://www.dec.ny.gov/docs/wildlife_pdf/cwdbooklet2019.pdf)

Assessing Vegetation Impacts from Deer (AVID)

<http://aviddeer.com>

Let Young Bucks Go and Watch Them Grow

[www.dec.ny.gov/outdoor/27663.html](http://www.dec.ny.gov/outdoor/27663.html)

Deer Hunter Surveys

[www.dec.ny.gov/outdoor/74971.html](http://www.dec.ny.gov/outdoor/74971.html)

Deer Overabundance

[www.dec.ny.gov/animals/104911.html](http://www.dec.ny.gov/animals/104911.html)

Community Deer Management Guide

[www.dec.ny.gov/docs/wildlife\\_pdf/commdeermgmtguide.pdf](http://www.dec.ny.gov/docs/wildlife_pdf/commdeermgmtguide.pdf)

Deer Management in Urban and Suburban New York

[www.dec.ny.gov/docs/wildlife\\_pdf/decdeerreport18.pdf](http://www.dec.ny.gov/docs/wildlife_pdf/decdeerreport18.pdf)

History of the White-Tailed Deer in New York (Severinghaus and Brown, 1956)

[www.dec.ny.gov/docs/wildlife\\_pdf/histdeernewyork.pdf](http://www.dec.ny.gov/docs/wildlife_pdf/histdeernewyork.pdf)

### General Deer Management Resources

An Evaluation of Deer Management Options

[www.dec.ny.gov/docs/wildlife\\_pdf/Deermgtopt08.pdf](http://www.dec.ny.gov/docs/wildlife_pdf/Deermgtopt08.pdf)

Community Deer Advisor

<https://deeradvisor.dnr.cornell.edu>

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](http://www.deerandforests.org)

Community-based Deer Management A Practitioners Guide

<http://wildlifecontrol.info/wp-content/uploads/2016/04/Deer-Practitioner-Guide.pdf>

Managing White-Tailed Deer in Suburban Environments – A Technical Guide

[http://wildlifecontrol.info/wp-content/uploads/2016/04/Deer\\_management\\_mechs.pdf](http://wildlifecontrol.info/wp-content/uploads/2016/04/Deer_management_mechs.pdf)

Reducing Deer-Vehicle Crashes: Wildlife Damage Management Fact Sheet

[http://wildlifecontrol.info/wp-content/uploads/2016/04/Deer-Vehicle\\_factsheet1.pdf](http://wildlifecontrol.info/wp-content/uploads/2016/04/Deer-Vehicle_factsheet1.pdf)

Reducing Deer Damage to Home Gardens and Landscape Plantings

<http://wildlifecontrol.info/wp-content/uploads/2016/04/reducing-deer-damage.pdf>

White-Tailed Deer: Wildlife Damage Management Fact Sheet

[http://wildlifecontrol.info/wp-content/uploads/2016/04/Deer\\_factsheet.pdf](http://wildlifecontrol.info/wp-content/uploads/2016/04/Deer_factsheet.pdf)

## Appendix 1. Timeline of Major Changes in New York State Deer Management

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<u>Year</u>	<u>Subject</u>	<u>Area*</u>	<u>Description</u>
1705	Season	Counties	First known law protecting deer. Killing deer prohibited January through July.
1788	Season	State	First statewide law protecting deer, season closed January through July.
1880	Government	State	Eight Game Protectors hired by the Governor of New York
1895	Government	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	Government	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	Government	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 second tag good for regular season

<u>Year</u>	<u>Subject</u>	<u>Area*</u>	<u>Description</u>
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
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)
1998	Season	State	Deer Management Assistance Program (DMAP) initiated
1999	Sex/age	SZ	Deer of either sex may now be taken in the Southern Zone muzzleloading season.
1999–2003	Season	NZ	DMPs phased into several Northern Zone WMUs in 1999, 2002, and 2003.
2002	Feeding	State	Established a prohibition on feeding wild white-tailed deer
2002	Licensing	State	DECALS, a 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 five captive and two 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 nine 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)

<u>Year</u>	<u>Subject</u>	<u>Area*</u>	<u>Description</u>
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	Disease	State	CWD Containment Area decommissioned; restrictions on intrastate transport of harvested deer lifted
2011	Implement	State	Crossbows legalized for deer hunting during any season when shotguns or muzzleloaders are used, except in Suffolk County
2011	Licensing	State	Harvest reporting period extended from 48 hours to 7 days after harvest
2011	Sex/age	Cat	Mandatory antler point restrictions imposed by statute (Environmental Conservation Law 11-0914) in the southern portion of WMU 3A
2012	Season	State	Youth Firearms Deer Hunt established over Columbus Day Weekend for junior hunters to take 1 deer of either sex
2012	Season	State	Bowhunting season in the Southern Zone and the regular season in Westchester County changed to begin on October 1. A late Northern Zone bowhunting season was established for the 7-day period after the regular season in WMUs that have a late muzzleloader season
2012	Sex/age	Cat	Mandatory antler point restrictions continued in WMUs 3C, 3H, 3J, and 3K and extended by regulation in WMUs 3A, 4G, 4O, 4P, 4R, 4S, and 4W
2012	Season	Region 7	Deer Management Focus Area established in the Ithaca area of Tompkins County, authorizing hunters to take 2 antlerless deer per day and creating a special firearms season in January
2012	Season	NZ	DMPs allowed during all seasons in Northern Zone WMUs where DMPs are issued
2013	Implement	State	Crossbow use for big game hunting prohibited because the law expired
2014	Licensing	State	License year adjusted from 10/1–9/30 to 9/1–8/31
2014	Implement	State	Crossbows again legalized for big game hunting during the regular season, late muzzleloader season, and a portion of the early bowhunting season (last 10 days of the NZ bowhunting season; last 14 days of the SZ bowhunting season). Crossbows continued to be prohibited for use in bowhunting-only areas

<u>Year</u>	<u>Subject</u>	<u>Area*</u>	<u>Description</u>
2014	Implement	State	Setback distances for bowhunting reduced to 150 feet for vertical bows and 250 feet for crossbows
2015	Season	NZ	Early muzzleloading season in WMU 6A limited to antlered deer only to reduce antlerless harvest
2015	Season	SZ	First 2 weeks of early bowhunting season and all of the late bow/muzzleloader season limited to antlerless deer only in WMUs 1C, 3M, 3S, 4J, 8A, 8C, 8F, 8G, 8H, 8N, 9A, and 9F to increase antlerless harvest
2015	Data	State	Wildlife Management Unit Aggregates established to compile biological and Bowhunter Sighting Log data over multiple WMUs
2016	Sex/age	State	DEC initiates campaign for hunters to voluntarily <i>Let Young Bucks Go and Watch Them Grow</i> after a structured decision-making process found mandatory antler point restrictions to be less compatible with hunter values. Existing mandatory antler restriction rules were retained
2016	Season	SZ	Rescinded the antlerless-only portion of the season in WMUs 1C, 3M, 3S, 4J, 8A, 8C, 8F, 8G, 8H, 8N, 9A, and 9F
2016	Season	NZ	Early muzzleloading season in WMUs 6F and 6J limited to antlered deer only to reduce antlerless harvest
2018	Disease	State	Interagency CWD Risk Minimization Plan adopted by DEC and NYS DAM
2019	Feeding	State	Strengthened prohibitions on feeding deer; prohibited sale of commercial deer foods unless labeled as illegal for use
2019	Disease	State	Prohibited importation of whole carcasses of deer, elk, moose, and caribou into New York

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



Photo courtesy of Jeb McConnell

## Appendix 2. Identifying Desired Deer Population Trajectories

In 2020, DEC began using a two-part approach to establish deer population trajectories for each Wildlife Management Unit (WMU) Aggregate, incorporating data about the status of deer impacts on forest sustainability and public desires for deer population change (Figure 1). Outcomes of this process yield a recommendation to manage the deer population toward an approximate 25% increase, a 25% decrease, or for the local population to remain stable for the next 10-year period. Objectives for deer population

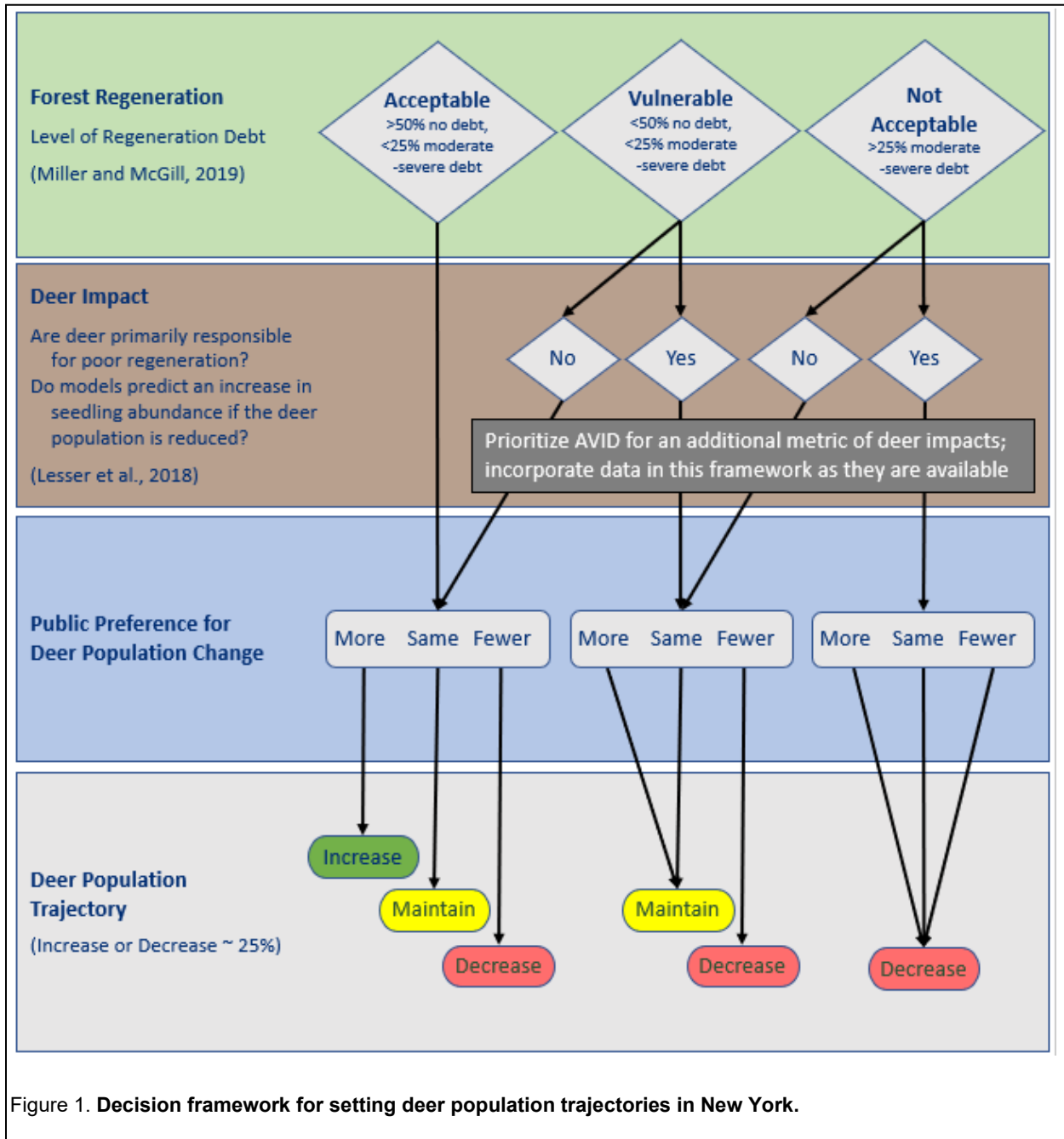


Figure 1. Decision framework for setting deer population trajectories in New York.

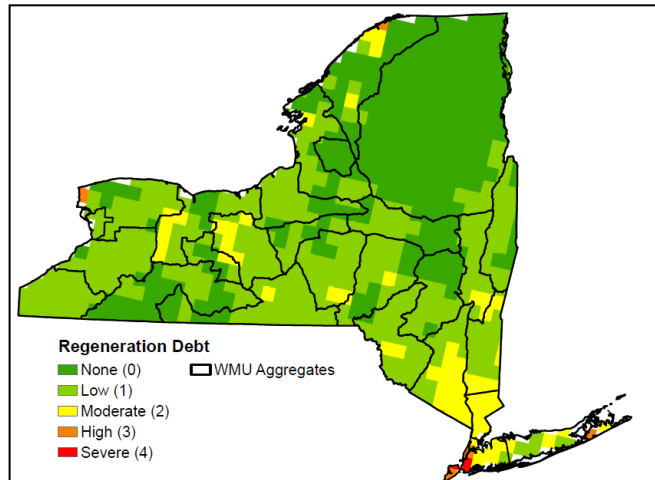
trajectories will apply equally for all WMUs within a WMU Aggregate, though the deer population may vary slightly across WMUs. DEC will continue to manage deer populations within individual WMUs toward the objective using DMP allocations and/or modifying special seasons as needed ([Strategy 1.2.2](#)).



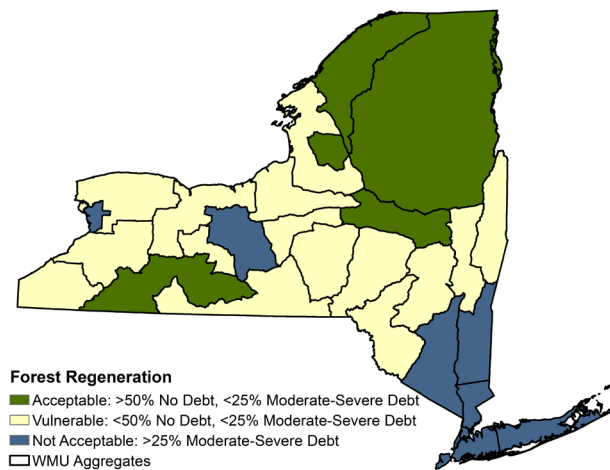
## Part 1: Deer Impacts on Forest Sustainability

To assess forest sustainability across the landscape of New York, we adopted the regeneration debt analysis published by Miller and McGill (2019). The term “regeneration debt” describes a condition that predicts the eventual loss of canopy species due to limited abundance of seedlings and saplings or a mismatch in species composition relative to the forest canopy. Essentially, regeneration debt exists when the number of seedlings and saplings is inadequate to fully replace the mature trees or when the species of seedlings and saplings present suggests a broad transition in forest composition. The regeneration debt index is calculated for each 10 km<sup>2</sup> block in New York and ranges from 0 (no debt) to 4 (severe debt) (Figure 2). When regeneration debt is absent, the forest is typically sustainable and capable of replacing itself. Forests with a low level of regeneration debt are vulnerable, compromised by inadequate seedling or sapling abundance or species mismatch. When regeneration debt is moderate to severe, the existing forest is unlikely to replace itself in the current form.

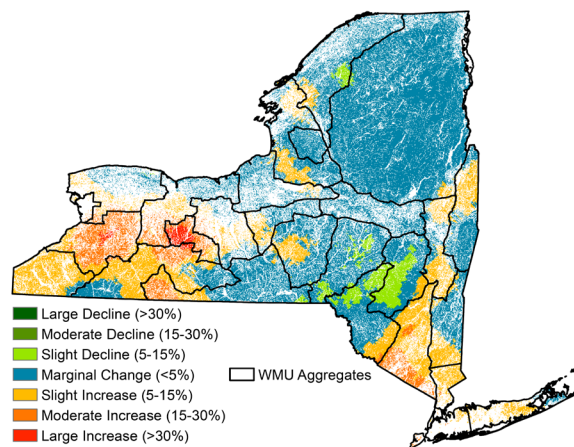
For our deer management purposes, we calculated the proportion of each WMU Aggregate within each regeneration debt index value (0–4) and then assigned each aggregate a forest sustainability classification of acceptable, vulnerable, or not acceptable. We classified WMU Aggregates having >50% of the area with no regeneration debt (index of 0) and no more than 25% of the area with moderate to severe regeneration debt (index values  $\geq 2$ ) as “acceptable.” We classified WMU Aggregates having >50% of the area with low regeneration debt (index value of 1) and no more than 25% of the area with moderate to severe regeneration debt (index values  $\geq 2$ ) as “vulnerable.” Finally, because the presence of moderate to severe regeneration debt (index values  $\geq 2$ ) within a WMU Aggregate is a significant ecological concern, we classified aggregates with >25% index values  $\geq 2$  as “not acceptable” (Figure 3).



**Figure 2:** Regeneration debt indices in New York (Miller and McGill, 2019).

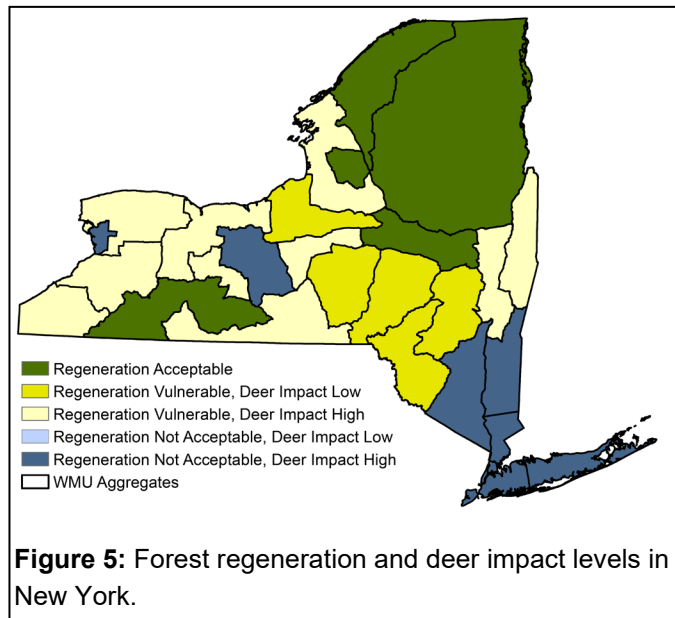


**Figure 3:** Forest sustainability in New York based on regeneration debt indices.



**Figure 4:** Predicted change in seedling density with a 25% reduction in deer abundance (Lesser et al.,

Regeneration debt may be influenced by a variety of factors (e.g., abiotic factors, invasive plant species, forest management practices), not just excessive deer browse. To parse out areas where deer impact is the primary contributing factor to poor regeneration, we used a model developed by Lesser et al. (2018), which predicts changes in seedling abundance following a potential reduction in deer abundance (Figure 4). In portions of New York, a modest reduction in deer abundance was predicted to yield either marginal change or a slight decrease in seedling abundance, suggesting deer impacts are not a substantial factor in forest regeneration in those areas. In other areas, seedling abundance was predicted to increase.



Of primary concern for deer management are the areas where forest regeneration was vulnerable or not acceptable and models predicted a likely increase in seedling abundance if deer populations are reduced. Thus, in WMU Aggregates classified as vulnerable or unacceptable regeneration (Figure 3), we calculated the portion of the aggregate in each category of predicted change in seedling abundance (i.e., decrease, marginal change, increase). We then classified aggregates as having high deer impact if seedling abundance was predicted to increase in >25% of the area (Figure 5). We prioritized aggregates with unacceptable regeneration and high deer impacts for deer population reduction as maintaining or increasing existing deer populations would be ecologically irresponsible. In aggregates with vulnerable forests or with unacceptable regeneration but low deer impacts, we will limit potential population management objectives to maintaining or decreasing existing deer populations, depending on public preferences in those areas.

Additionally, we will prioritize forest monitoring through the AVID protocol (Strategy 5.1.2; Figure 1) in any WMU Aggregate with a forest regeneration classification of vulnerable or not acceptable. AVID is a more sensitive, site-specific measurement than the impact modeling and will provide valuable metrics at the WMU Aggregate level. As AVID data become available, we will use them to further inform our decision for setting deer population trajectories. When AVID metrics are increasing (a sign of low deer impacts) managers know that the current deer population is not negatively affecting forest regeneration and wildflower abundance, suggesting that deer abundance could be maintained or increased as desired by the public. In contrast, decreasing or stagnant AVID metrics (a sign of high deer impacts) suggest an increase in deer abundance is not appropriate.

Because we set deer population objectives at the WMU Aggregate scale, we also assessed deer impacts at that scale. However, deer impacts vary within an aggregate and may be severe on individual properties despite relatively good forest regeneration and low deer impact in the aggregate as a whole. The AVID protocol is a helpful tool for landowners or property managers to monitor deer impacts at smaller scales. To address deer impacts on smaller scales, DEC provides the [Deer Management Assistance Program](#) for landowners or groups of landowners to accomplish tailored, site-specific deer management.

## Part 2: Public Input on Deer Population Size

To gather public input about deer population management, DEC and the Cornell University Center for Conservation Social Science conducted a survey of New Yorkers about their interests and concerns related to deer in areas where DEC has authority to manage deer populations through hunting. We implemented the survey geographically in stages from 2018–2020 and distributed the survey to 25,750 property owners across the state. We excluded non-resident landowners but targeted owners of 1-family, 2-family, and 3-family year-round residences, rural residences with acreage, properties used in agricultural production that contained a primary residence, recreational use properties, estates, and mobile homes.

2018 Survey Report: [www.dec.ny.gov/docs/wildlife\\_pdf/2018deersurveypart1.pdf](http://www.dec.ny.gov/docs/wildlife_pdf/2018deersurveypart1.pdf)

2019 Survey Report: [www.dec.ny.gov/docs/wildlife\\_pdf/2019deersurveypart2.pdf](http://www.dec.ny.gov/docs/wildlife_pdf/2019deersurveypart2.pdf)

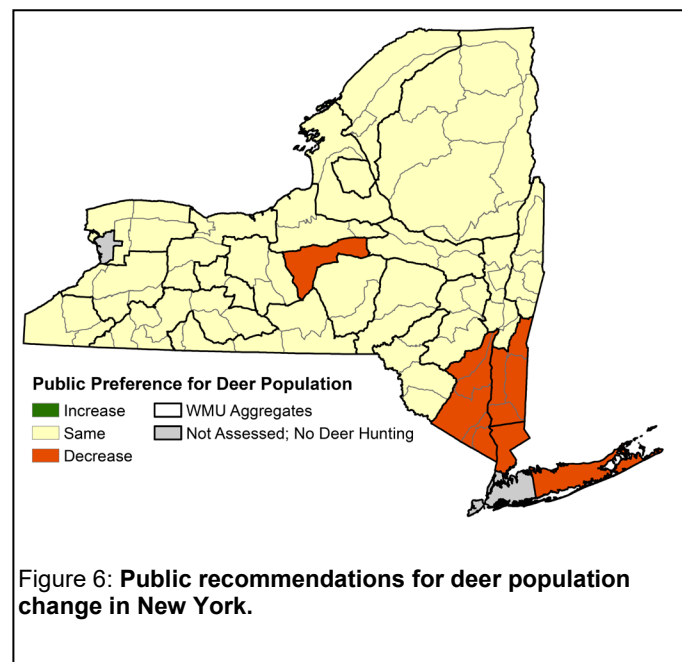
2020 Survey Report: [www.dec.ny.gov/docs/wildlife\\_pdf/2020deersurveypart3.pdf](http://www.dec.ny.gov/docs/wildlife_pdf/2020deersurveypart3.pdf)

With a 42% response rate, we heard from New Yorkers in all Wildlife Management Units. Approximately 54% of respondents were from rural areas, 28% from villages or hamlets, 15% from small cities, and 4% from large cities. Interestingly, despite the random sampling process, 31% of respondents identified themselves as hunters, which is considerably greater than the 3% of New York residents who are licensed hunters.

Though responses varied by WMU Aggregate, overall, more people reported enjoying deer but worrying about deer-related damage (54%) than enjoying deer and not worrying about damage (35%) or not enjoying deer and regarding them as a nuisance (6%). However, most respondents (47%) indicated feeling that the benefits of deer and problems caused by deer are an even tradeoff, whereas nearly the same proportion felt the benefits of deer outweighed the problems (27%) or problems outweighed the benefits (26%).

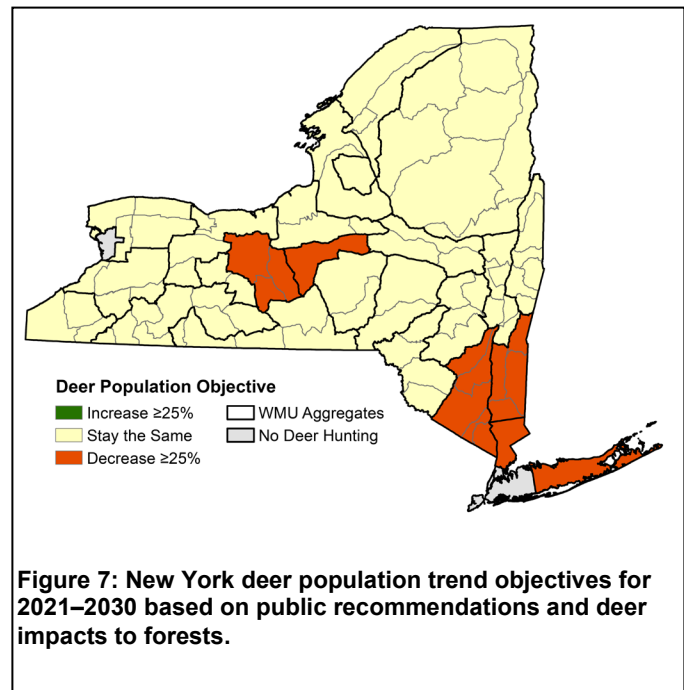
Importantly, the survey asked how New Yorkers would like the deer population to change in their local area in the future. Most respondents (range = 85.8%–96.3%) expressed a clear preference, and overall, most respondents preferred the deer population to stay about the same. Only in four WMU Aggregates did the public prefer a decrease in deer abundance (Figure 6).

For our decision framework for setting deer population trajectories (Figure 1), we used the population change category (i.e., increase, decrease, stay the same) that received the greatest support among respondents with a preference (Table 1). We set the default recommendation as “stay the same” when the confidence interval of the top choice overlapped with one or both of the others.

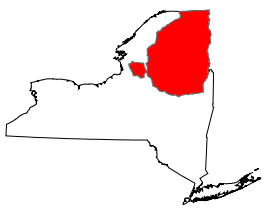
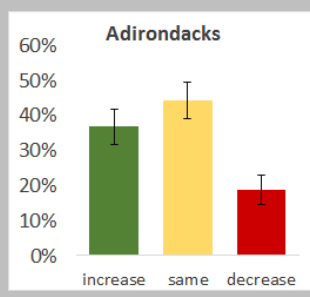


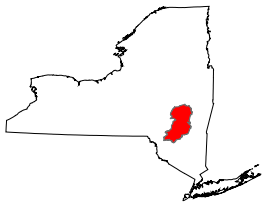
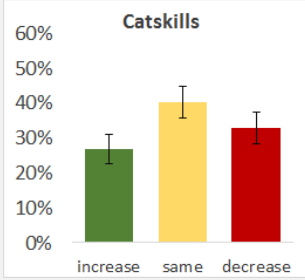
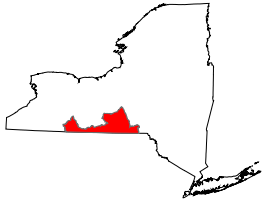
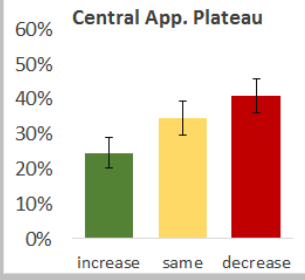
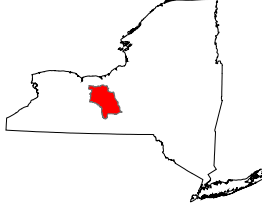
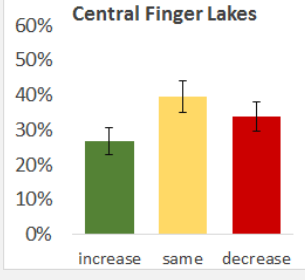
## Deer Population Trend Objectives for 2021–2030

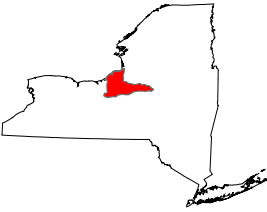
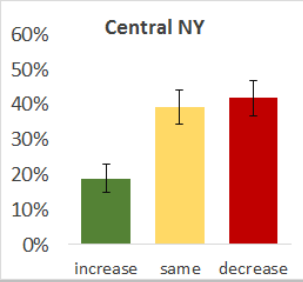
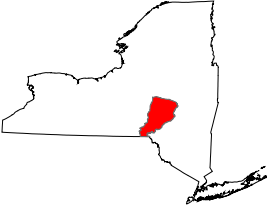
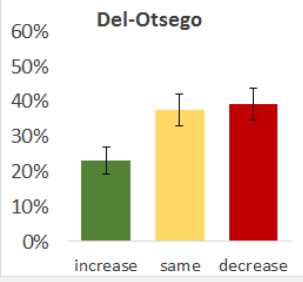
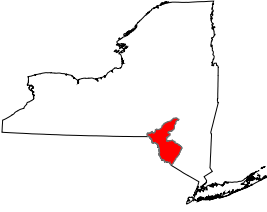
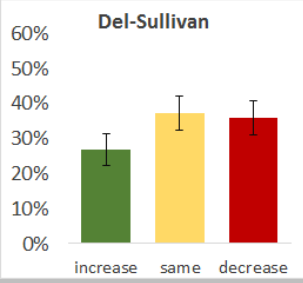
Using the combined inputs of forest impacts and public recommendations, we followed the previously described decision framework to establish objectives for deer population trends for each WMU Aggregate (Figure 7, Table 1).

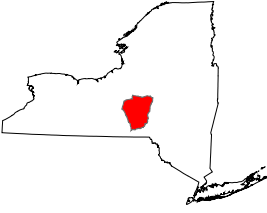
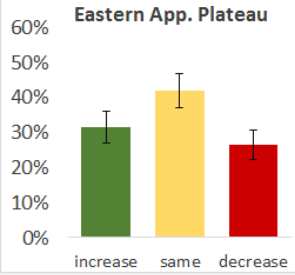
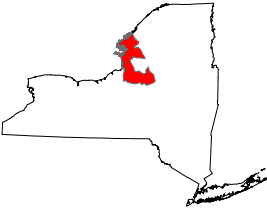
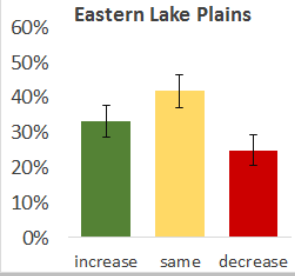
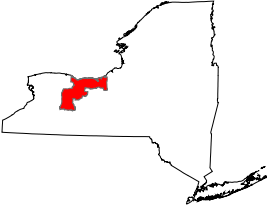
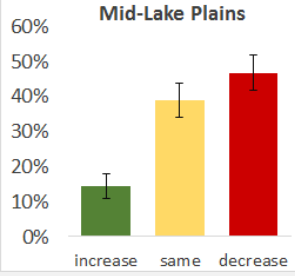


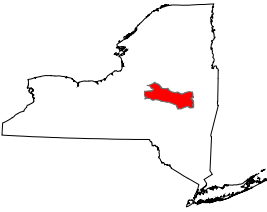
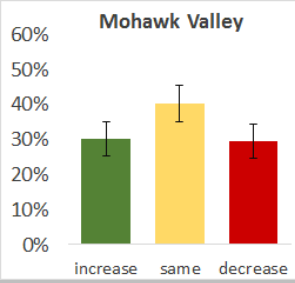
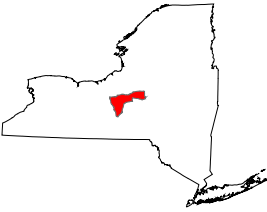
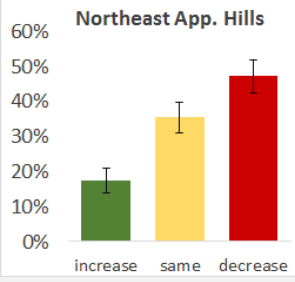
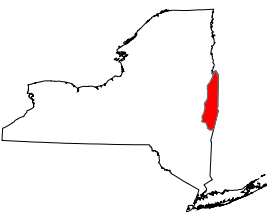
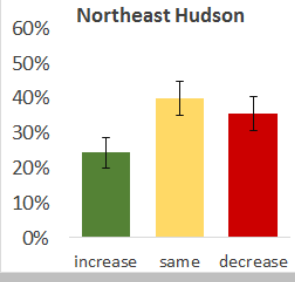
**Table 1.** Summary data used with the decision framework of Figure 1 to establish deer population trajectories for each Wildlife Management Unit Aggregate in New York.

WMU Aggregate	Forest Regeneration: Do regeneration debt indicators suggest forest conditions are acceptable, vulnerable, or not acceptable?	Deer Impact: Do models predict an increase in seedling abundance if the deer population is reduced?	Public Preference for Deer Population Change	Deer Population Trajectory												
<b>Adirondacks</b> WMUs 5A, 5C, 5F, 5G, 5H, 5J, 6F, 6J, 6N 	<b>Acceptable</b> <table border="1"> <thead> <tr> <th>Index</th> <th>%</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>93.1</td> </tr> <tr> <td>1</td> <td>6.9</td> </tr> <tr> <td>2</td> <td>0</td> </tr> <tr> <td>3</td> <td>0</td> </tr> <tr> <td>4</td> <td>0</td> </tr> </tbody> </table>	Index	%	0	93.1	1	6.9	2	0	3	0	4	0	<b>NA</b>	<b>Stay the Same</b> 	<b>Maintain</b>
Index	%															
0	93.1															
1	6.9															
2	0															
3	0															
4	0															

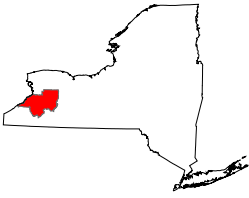
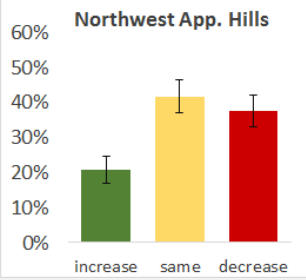
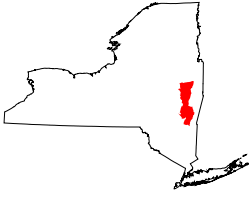
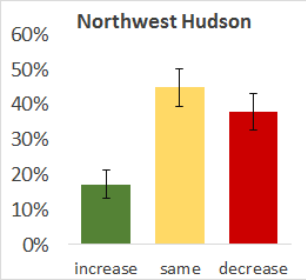
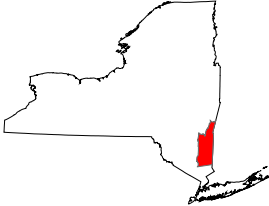
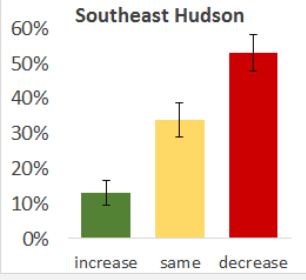
WMU Aggregate	Forest Regeneration	Deer Impact	Public Preference for Deer Population Change	Deer Population Trajectory												
<b>Catskills</b> WMUs 3A, 4G, 4H, 4R 	<b>Vulnerable</b> <table border="1"> <thead> <tr> <th>Index</th> <th>%</th> </tr> </thead> <tbody> <tr><td>0</td><td>45.3</td></tr> <tr><td>1</td><td>54.7</td></tr> <tr><td>2</td><td>0</td></tr> <tr><td>3</td><td>0</td></tr> <tr><td>4</td><td>0</td></tr> </tbody> </table>	Index	%	0	45.3	1	54.7	2	0	3	0	4	0	<b>No</b> Monitor local conditions with AVID	<b>Stay the Same</b> 	<b>Maintain</b>
Index	%															
0	45.3															
1	54.7															
2	0															
3	0															
4	0															
<b>Central Appalachian Plateau</b> WMUs 7R, 7S, 8X, 8Y, 9Y 	<b>Vulnerable</b> <table border="1"> <thead> <tr> <th>Index</th> <th>%</th> </tr> </thead> <tbody> <tr><td>0</td><td>19.8</td></tr> <tr><td>1</td><td>76.7</td></tr> <tr><td>2</td><td>3.5</td></tr> <tr><td>3</td><td>0</td></tr> <tr><td>4</td><td>0</td></tr> </tbody> </table>	Index	%	0	19.8	1	76.7	2	3.5	3	0	4	0	<b>Yes</b> Monitor local conditions with AVID	<b>Stay the Same</b> 	<b>Maintain</b>
Index	%															
0	19.8															
1	76.7															
2	3.5															
3	0															
4	0															
<b>Central Finger Lakes</b> WMUs 7H, 8J, 8S 	<b>Not Acceptable</b> <table border="1"> <thead> <tr> <th>Index</th> <th>%</th> </tr> </thead> <tbody> <tr><td>0</td><td>2.0</td></tr> <tr><td>1</td><td>72.0</td></tr> <tr><td>2</td><td>25.7</td></tr> <tr><td>3</td><td>0</td></tr> <tr><td>4</td><td>0</td></tr> </tbody> </table>	Index	%	0	2.0	1	72.0	2	25.7	3	0	4	0	<b>Yes</b> Monitor local conditions with AVID	<b>Stay the Same</b> 	<b>Decrease</b>
Index	%															
0	2.0															
1	72.0															
2	25.7															
3	0															
4	0															

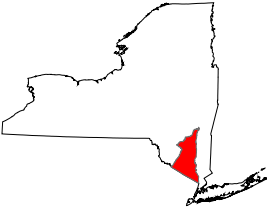
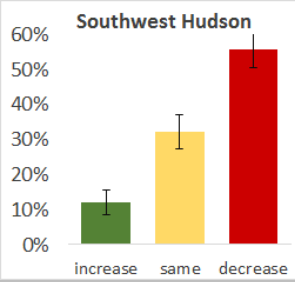
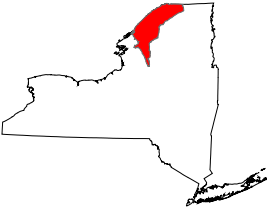
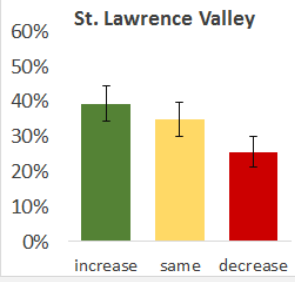
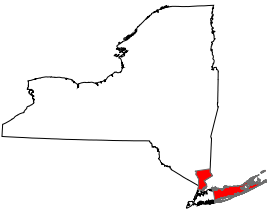
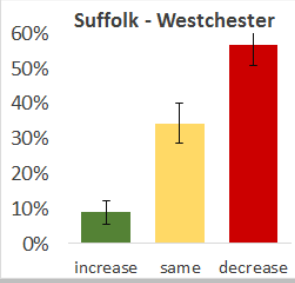
<p><b>Central NY</b></p> <p>WMUs 6P, 7A, 7F</p> 	<p><b>Vulnerable</b></p> <table border="1"> <thead> <tr> <th>Index</th> <th>%</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>26.1</td> </tr> <tr> <td>1</td> <td>73.9</td> </tr> <tr> <td>2</td> <td>0</td> </tr> <tr> <td>3</td> <td>0</td> </tr> <tr> <td>4</td> <td>0</td> </tr> </tbody> </table>	Index	%	0	26.1	1	73.9	2	0	3	0	4	0	<p><b>No</b></p> <p>Monitor local conditions with AVID</p>	<p><b>Stay the Same</b></p> 	<p><b>Maintain</b></p>
Index	%															
0	26.1															
1	73.9															
2	0															
3	0															
4	0															
<p><b>WMU Aggregate</b></p>	<p><b>Forest Regeneration</b></p>	<p><b>Deer Impact</b></p>	<p><b>Public Preference for Deer Population Change</b></p>	<p><b>Deer Population Trajectory</b></p>												
<p><b>Delaware-Otsego</b></p> <p>WMUs 4F, 4O</p> 	<p><b>Vulnerable</b></p> <table border="1"> <thead> <tr> <th>Index</th> <th>%</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>31.7</td> </tr> <tr> <td>1</td> <td>62.9</td> </tr> <tr> <td>2</td> <td>5.4</td> </tr> <tr> <td>3</td> <td>0</td> </tr> <tr> <td>4</td> <td>0</td> </tr> </tbody> </table>	Index	%	0	31.7	1	62.9	2	5.4	3	0	4	0	<p><b>No</b></p> <p>Monitor local conditions with AVID</p>	<p><b>Stay the Same</b></p> 	<p><b>Maintain</b></p>
Index	%															
0	31.7															
1	62.9															
2	5.4															
3	0															
4	0															
<p><b>Delaware-Sullivan</b></p> <p>WMUs 3H, 3K, 4P, 4W</p> 	<p><b>Vulnerable</b></p> <table border="1"> <thead> <tr> <th>Index</th> <th>%</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>3.5</td> </tr> <tr> <td>1</td> <td>87.7</td> </tr> <tr> <td>2</td> <td>8.8</td> </tr> <tr> <td>3</td> <td>0</td> </tr> <tr> <td>4</td> <td>0</td> </tr> </tbody> </table>	Index	%	0	3.5	1	87.7	2	8.8	3	0	4	0	<p><b>No</b></p> <p>Monitor local conditions with AVID</p>	<p><b>Stay the Same</b></p> 	<p><b>Maintain</b></p>
Index	%															
0	3.5															
1	87.7															
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3	0															
4	0															

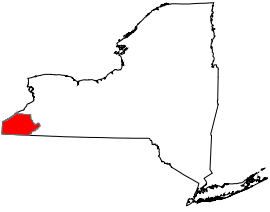
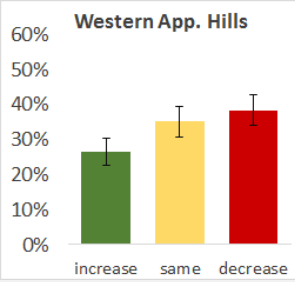
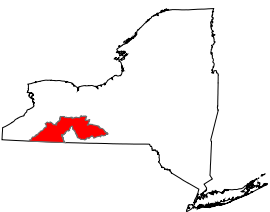
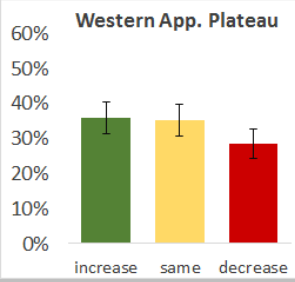
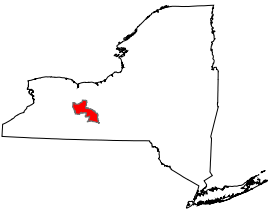
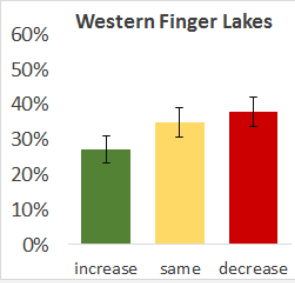
<p><b>Eastern Appalachian Plateau</b></p> <p>WMUs 7M, 7P</p> 	<p><b>Vulnerable</b></p> <table border="1"> <thead> <tr> <th>Index</th> <th>%</th> </tr> </thead> <tbody> <tr><td>0</td><td>12.6</td></tr> <tr><td>1</td><td>79.7</td></tr> <tr><td>2</td><td>7.8</td></tr> <tr><td>3</td><td>0</td></tr> <tr><td>4</td><td>0</td></tr> </tbody> </table>	Index	%	0	12.6	1	79.7	2	7.8	3	0	4	0	<p><b>No</b></p> <p>Monitor local conditions with AVID</p>	<p><b>Stay the Same</b></p> 	<p><b>Maintain</b></p>
Index	%															
0	12.6															
1	79.7															
2	7.8															
3	0															
4	0															
<p><b>Eastern Lake Plains</b></p> <p>WMUs 6G, 6K</p> 	<p><b>Vulnerable</b></p> <table border="1"> <thead> <tr> <th>Index</th> <th>%</th> </tr> </thead> <tbody> <tr><td>0</td><td>38.8</td></tr> <tr><td>1</td><td>57.6</td></tr> <tr><td>2</td><td>3.6</td></tr> <tr><td>3</td><td>0</td></tr> <tr><td>4</td><td>0</td></tr> </tbody> </table>	Index	%	0	38.8	1	57.6	2	3.6	3	0	4	0	<p><b>Yes</b></p> <p>Monitor local conditions with AVID</p>	<p><b>Stay the Same</b></p> 	<p><b>Maintain</b></p>
Index	%															
0	38.8															
1	57.6															
2	3.6															
3	0															
4	0															
<p><b>WMU Aggregate</b></p>	<p><b>Forest Regeneration</b></p>	<p><b>Deer Impact</b></p>	<p><b>Public Preference for Deer Population Change</b></p>	<p><b>Deer Population Trajectory</b></p>												
<p><b>Mid-Lake Plains</b></p> <p>WMUs 8C, 8F, 8H, 8M</p> 	<p><b>Vulnerable</b></p> <table border="1"> <thead> <tr> <th>Index</th> <th>%</th> </tr> </thead> <tbody> <tr><td>0</td><td>21.3</td></tr> <tr><td>1</td><td>57.4</td></tr> <tr><td>2</td><td>21.4</td></tr> <tr><td>3</td><td>0</td></tr> <tr><td>4</td><td>0</td></tr> </tbody> </table>	Index	%	0	21.3	1	57.4	2	21.4	3	0	4	0	<p><b>Yes</b></p> <p>Monitor local conditions with AVID</p>	<p><b>Stay the Same</b></p> 	<p><b>Maintain</b></p>
Index	%															
0	21.3															
1	57.4															
2	21.4															
3	0															
4	0															

<p><b>Mohawk Valley</b></p> <p>WMUs 4A, 6R, 6S</p> 	<p><b>Acceptable</b></p> <table border="1"> <thead> <tr> <th>Index</th> <th>%</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>54.0</td> </tr> <tr> <td>1</td> <td>46.0</td> </tr> <tr> <td>2</td> <td>0</td> </tr> <tr> <td>3</td> <td>0</td> </tr> <tr> <td>4</td> <td>0</td> </tr> </tbody> </table>	Index	%	0	54.0	1	46.0	2	0	3	0	4	0	<p><b>NA</b></p>	<p><b>Stay the Same</b></p> 	<p><b>Maintain</b></p>
Index	%															
0	54.0															
1	46.0															
2	0															
3	0															
4	0															
<p><b>Northeast Appalachian Hills</b></p> <p>WMU 7J</p> 	<p><b>Vulnerable</b></p> <table border="1"> <thead> <tr> <th>Index</th> <th>%</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>41.2</td> </tr> <tr> <td>1</td> <td>58.8</td> </tr> <tr> <td>2</td> <td>0</td> </tr> <tr> <td>3</td> <td>0</td> </tr> <tr> <td>4</td> <td>0</td> </tr> </tbody> </table>	Index	%	0	41.2	1	58.8	2	0	3	0	4	0	<p><b>Yes</b></p> <p>Monitor local conditions with AVID</p>	<p><b>Decrease</b></p> 	<p><b>Decrease</b></p>
Index	%															
0	41.2															
1	58.8															
2	0															
3	0															
4	0															
<p><b>Northeast Hudson</b></p> <p>WMUs 4C, 4K, 4L, 4U, 5S, 5T</p> 	<p><b>Vulnerable</b></p> <table border="1"> <thead> <tr> <th>Index</th> <th>%</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>22.6</td> </tr> <tr> <td>1</td> <td>77.4</td> </tr> <tr> <td>2</td> <td>0</td> </tr> <tr> <td>3</td> <td>0</td> </tr> <tr> <td>4</td> <td>0</td> </tr> </tbody> </table>	Index	%	0	22.6	1	77.4	2	0	3	0	4	0	<p><b>Yes</b></p> <p>Monitor local conditions with AVID</p>	<p><b>Stay the Same</b></p> 	<p><b>Maintain</b></p>
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WMU Aggregate	Forest Regeneration	Deer Impact	Public Preference for Deer Population Change	Deer Population Trajectory												
<b>Northwest Appalachian Hills</b> WMUs 9G, 9H, 9M, 9N 	<b>Vulnerable</b> <table border="1"> <thead> <tr> <th>Index</th> <th>%</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>8.5</td> </tr> <tr> <td>1</td> <td>91.1</td> </tr> <tr> <td>2</td> <td>0.4</td> </tr> <tr> <td>3</td> <td>0</td> </tr> <tr> <td>4</td> <td>0</td> </tr> </tbody> </table>	Index	%	0	8.5	1	91.1	2	0.4	3	0	4	0	<b>Yes</b>  Monitor local conditions with AVID	<b>Stay the Same</b> 	<b>Maintain</b>
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<b>Northwest Hudson</b> WMUs 4B, 4J, 4S, 4T, 4Y, 5R 	<b>Vulnerable</b> <table border="1"> <thead> <tr> <th>Index</th> <th>%</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>5.3</td> </tr> <tr> <td>1</td> <td>81.9</td> </tr> <tr> <td>2</td> <td>12.8</td> </tr> <tr> <td>3</td> <td>0</td> </tr> <tr> <td>4</td> <td>0</td> </tr> </tbody> </table>	Index	%	0	5.3	1	81.9	2	12.8	3	0	4	0	<b>Yes</b>  Monitor local conditions with AVID	<b>Stay the Same</b> 	<b>Maintain</b>
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<b>Southeast Hudson</b> WMUs 3F, 3G, 3N, 4Z 	<b>Not Acceptable</b> <table border="1"> <thead> <tr> <th>Index</th> <th>%</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>0</td> </tr> <tr> <td>1</td> <td>67.6</td> </tr> <tr> <td>2</td> <td>32.4</td> </tr> <tr> <td>3</td> <td>0</td> </tr> <tr> <td>4</td> <td>0</td> </tr> </tbody> </table>	Index	%	0	0	1	67.6	2	32.4	3	0	4	0	<b>Yes</b>  Monitor local conditions with AVID	<b>Decrease</b> 	<b>Decrease</b>
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2	32.4															
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<p><b>Southwest Hudson</b></p> <p>WMUs 3C, 3J, 3M, 3P, 3R</p> 	<p><b>Not Acceptable</b></p> <table border="1" data-bbox="431 205 667 548"> <thead> <tr> <th>Index</th> <th>%</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>0.8</td> </tr> <tr> <td>1</td> <td>45.6</td> </tr> <tr> <td>2</td> <td>53.4</td> </tr> <tr> <td>3</td> <td>0.2</td> </tr> <tr> <td>4</td> <td>0</td> </tr> </tbody> </table>	Index	%	0	0.8	1	45.6	2	53.4	3	0.2	4	0	<p><b>Yes</b></p> <p>Monitor local conditions with AVID</p>	<p><b>Decrease</b></p> 	<p><b>Decrease</b></p>
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<p><b>WMU Aggregate</b></p>	<p><b>Forest Regeneration</b></p>	<p><b>Deer Impact</b></p>	<p><b>Public Preference for Deer Population Change</b></p>	<p><b>Deer Population Trajectory</b></p>												
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<p><b>Western Appalachian Hills</b></p> <p>WMUs 9J, 9K, 9R</p> 	<p><b>Vulnerable</b></p> <table border="1"> <thead> <tr> <th>Index</th> <th>%</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>1.5</td> </tr> <tr> <td>1</td> <td>98.5</td> </tr> <tr> <td>2</td> <td>0</td> </tr> <tr> <td>3</td> <td>0</td> </tr> <tr> <td>4</td> <td>0</td> </tr> </tbody> </table>	Index	%	0	1.5	1	98.5	2	0	3	0	4	0	<p><b>Yes</b></p> <p>Monitor local conditions with AVID</p>	<p><b>Stay the Same</b></p> 	<p><b>Maintain</b></p>
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2	0															
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<p><b>WMU Aggregate</b></p>		<p><b>Forest Regeneration</b></p>	<p><b>Deer Impact</b></p>	<p><b>Public Preference for Deer Population Change</b></p>	<p><b>Deer Population Trajectory</b></p>											
<p><b>Western Finger Lakes</b></p> <p>WMUs 8N, 8R</p> 	<p><b>Vulnerable</b></p> <table border="1"> <thead> <tr> <th>Index</th> <th>%</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>39.7</td> </tr> <tr> <td>1</td> <td>48.0</td> </tr> <tr> <td>2</td> <td>12.3</td> </tr> <tr> <td>3</td> <td>0</td> </tr> <tr> <td>4</td> <td>0</td> </tr> </tbody> </table>	Index	%	0	39.7	1	48.0	2	12.3	3	0	4	0	<p><b>Yes</b></p> <p>Monitor local conditions with AVID</p>	<p><b>Stay the Same</b></p> 	<p><b>Maintain</b></p>
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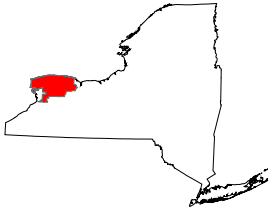
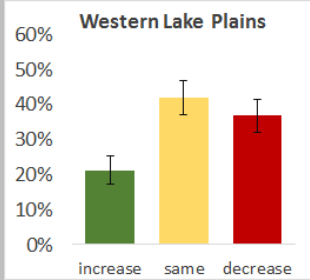
<b>Western Lake Plains</b> WMUs 8A, 8G, 9A, 9F 	<b>Vulnerable</b>		<b>Yes</b>  Monitor local conditions with AVID	<b>Stay the Same</b> 	<b>Maintain</b>
	Index	%			
	0	22.8			
	1	71.6			
	2	2.6			
	3	3.0			
	4	0			



Photo courtesy of Mary Tashjian

## Appendix 3. Recommendation to Prohibit Cervid Biofluids in New York

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Krysten L. Schuler  
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### 1. Overview: Cervid Biofluids Impose an Avoidable CWD Risk to New York Deer

Chronic wasting disease (CWD) is a fatal disease of cervids (deer, elk, moose, and reindeer) caused by an infectious prion. If established in New York, CWD would pose a serious threat to New York's white-tailed deer and moose population, the deer hunting tradition, and the many other benefits associated with a wild white-tailed deer and moose population.

CWD was identified in New York in 2005 in five captive and two wild white-tailed deer, but following an intensive response and continued heightened surveillance, CWD has not been detected subsequently. However, commercially available products containing cervid biofluids (urine, saliva, feces, and glandular fluids) may contain prions that, through their use by hunters, could inadvertently introduce CWD again to New York.

In August 2017, the New York State Department of Environmental Conservation (DEC) and Department of Agriculture and Markets (DAM) published a draft plan to minimize risk of chronic wasting disease (CWD) to New York deer and moose. The draft recommended numerous actions and regulatory approaches to reduce CWD exposure risk, including a proposal to prohibit *“retail sale, and possession, use, and distribution while afield of the urine, glands, or other excreted substances or products containing the urine or excreted substances from any CWD-susceptible animal for any purpose.”*

After review of public comment on the draft plan, DEC and DAM adopted a final [NYS Interagency Risk Minimization Plan](#) in February 2018 that did not recommend prohibition of urine-based products. Rather, the plan calls for DEC to “continue to assess the risk posed by use of products composed of urine and excreted substances from any CWD-susceptible animal as a route for introduction and spread of CWD in New York and propose appropriate steps to address this threat.” This document is the product of that continued assessment.

### 2. Scientific Support: Cervid Biofluids May Spread CWD

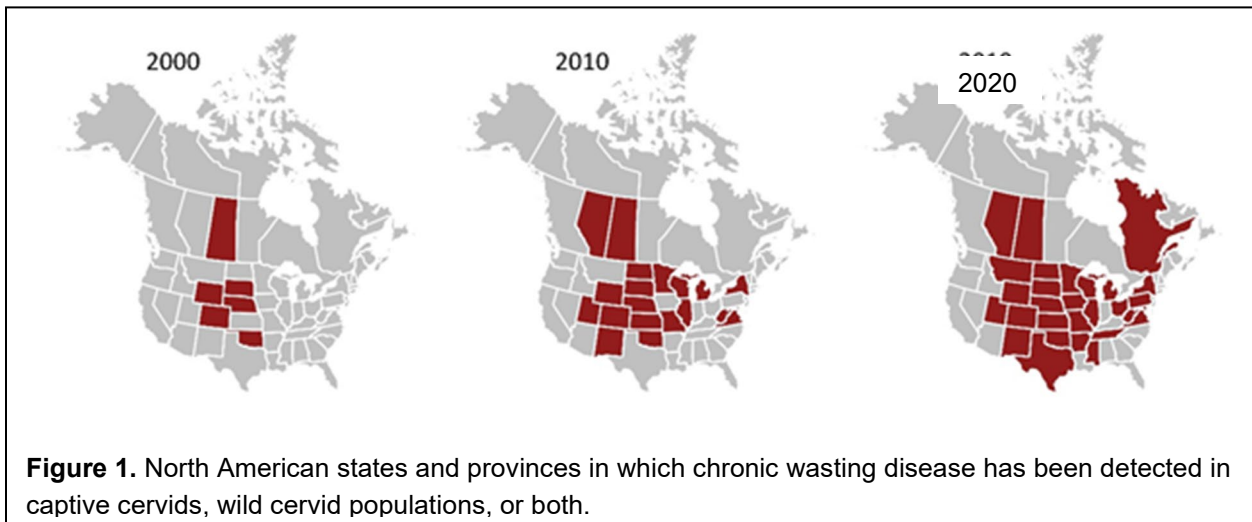
There is no “safe” dose of prion (Fryer and McLean, 2011). CWD prions have been detected in saliva, feces, blood, antler velvet, and urine (Angers et al., 2006; Angers et al., 2009; Haley et al., 2011; Henderson et al., 2015; John et al., 2013; Mathiason et al., 2006; Plummer et al., 2017). Recent work indicates that a prion dose of 100–300 ng of brain tissue is sufficient to cause infection in white-tailed deer (Denkers et al., 2020), indicating infectious doses of saliva and urine are smaller than previously thought. Prions may be excreted in higher concentrations in saliva and feces than in urine (Henderson et al., 2015; Plummer et al., 2017), but prions can exist in urine and are capable of causing infections. Because saliva, feces, urine, and glandular fluids of multiple animals and locations may be mixed together and marketed as an attractant, we will hereafter refer to all excreta as biofluids.

Infected deer can shed CWD prions in their urine for months (or years) prior to developing clinical signs and could shed thousands of infectious doses of prion over the course of the deer's life (Henderson et al., 2015). Consequently, the biofluids of an infected captive cervid may be collected for 6–12 months before the animal begins to look or behave abnormally due to the disease.

Deer urine and other biofluid products are marketed as deer attractants, which increases the likelihood of exposure to wild cervids. These products are put into the environment where prions can readily bind to soil minerals and remain infectious (Johnson et al., 2006). If cervid biofluids containing prions are put on the landscape by deer hunters, in a scrape or other area used by cervids, prions may bind to soil and contaminate that location for years or decades. Models have demonstrated that risk of CWD transmission from the environment increases over time as prions accumulate (Almberg et al., 2011). Repeated applications of infected biofluids at the same place over time could potentially build a reservoir of prions, increasing the likelihood of transmission (Mathiason et al., 2009). Plants are capable of binding prions on leaves and taking up prions into their tissues; those prions remain infectious (Pritzkow et al., 2015). Cervids attracted to a CWD-contaminated location may ingest any prions present in plants or soil or directly from the attractant material and become infected.

All cervid biofluids have not been completely evaluated for CWD by the most sensitive assays, which are available in a limited number of research laboratories. There are additional chemical compounds in these biofluids that may complicate and inhibit detection of prions. Using saliva as an example, Davenport et al. (2017) found that the longer CWD-positive saliva samples remained frozen prior to being tested, the test result became more sensitive. This may have happened because an inhibitory factor broke down during the extended time frozen. There have been few studies on deer urine (Haley et al., 2011; Henderson et al., 2015; Plummer et al., 2017), and it's possible that similar inhibitor compounds may be present, but unaccounted for in urine.

An additional complication may be that the tissue (i.e., saliva, urine, feces, brain) containing prions may be an important factor in transmissibility. Deer originally infected via saliva were 2.77 times more likely (95% CI: 1.55, 5.15) to shed prions in their saliva than deer infected via brain tissue (Davenport et al., 2017). Again, using saliva as an example for all biofluids, prion shedding in saliva happens relatively rapidly following exposure to prions. Following oral inoculation with saliva, experimental deer had a 79% probability of shedding prions at 3-months post-inoculation and 96% probability of shedding prions at 26-months post-inoculation; however, the onset of overt disease signs was not until 19.5-months post-inoculation (Davenport et al., 2017). Previous



studies examining deer urine used brain tissue to infect deer (Haley et al., 2011, Henderson et al., 2015), and thus may not demonstrate how animals would shed prions in a natural system.

Since 2000, CWD has spread into states and provinces east of the Mississippi River (Figure 1). Human-supported movement of live cervids has been a major driver of CWD geographic spread (Oraby et al., 2016); however, introductions to states, such as Virginia, that do not have a captive cervid industry might be facilitated by hunter transport of carcasses, natural dispersal movements of deer from closely neighboring jurisdictions, or hunter use of commercial biofluid products.

**3. Regulatory Justification: Inadequate Oversight of Cervid Biofluid Products**

There currently is no direct regulatory oversight of cervid biofluid products with respect to prions, and because there is not yet a validated, scalable, and practical test to detect prions in biofluid products, manufacturers cannot guarantee the safety of their products. Many of the larger manufacturers have their collection sites in states like Pennsylvania and Wisconsin where CWD has continued to spread and increase in prevalence in wild deer and among captive facilities.

The Archery Trade Association (ATA) started a voluntary Deer Protection Program for ATA-member scent manufacturers and suppliers to

**Jurisdictions that Prohibit the Sale and/or Use of Cervid Urine-based Products**

1. Alabama\* – effective 2019
2. Alaska – effective 2012
3. Arizona – effective 2013
4. Arkansas – effective 2017
5. Idaho – effective 2018
6. Louisiana\* – effective 2018
7. Manitoba – effective 2002
8. Michigan\* – effective 2018
9. Minnesota (disease management areas) – 2018
10. Mississippi\* – effective 2019
11. Montana\* - effective 2018
12. Nevada – effective 2020
13. New Jersey – effective 2021
14. New Mexico – date unknown
15. North Dakota (disease management area) – 2019
16. Nova Scotia – effective 2007
17. Ontario – effective 2010
18. Oregon – effective 2020
19. Pennsylvania (disease management areas) - 2013
20. Rhode Island – effective 2018
21. South Carolina – effective 2019
22. Tennessee\* – effective 2019
23. Virginia – effective 2015
24. Vermont – effective 2015
25. Yukon Territory –date unknown

\* allow use of products from companies enrolled in the ATA Deer Protection Program and/or which have been RT-QuIC tested.

have more protective restrictions on products and facilities that provide biofluids for those products. Although the ATA suggests that their participants represent 95% of the market, this program does not include local, small-scale producers and retailers. We estimate that New York State has about a dozen producers and only two are members of the ATA program. As of 2021, the ATA will no longer be supporting the Deer Protection Program and its future is currently uncertain.

Additionally, the ATA program is based on the U.S. Department of Agriculture (USDA) CWD Herd Certification Program (HCP), which has only proven effective at detecting CWD but not preventing the spread of CWD. The HCP has significant flaws that must be remedied to prevent additional CWD outbreaks in captive cervid facilities. For example, prior to adoption of the HCP in Federal Fiscal Year (FY) 2012, 51 herds in 11 states had CWD detections. Post-HCP implementation up to FY2020, CWD was detected at 86 captive cervid facilities in 16 different states. Of these herds, 67 were either enrolled in the HCP or certified, meaning they had been in the program for at least 5 years or purchased stock from a herd that was certified and accredited as “low risk” for CWD. The number of positive facilities identified has increased every year: 2 in FY2014, 9 in FY2015, 7 in FY2016, 8 in FY2017, 15 in FY2018, 17 in FY2019, and 21 CWD-positive captive facilities in FY2020 (data: National Wildlife Health Center, U.S. Geological Survey).

One function of the HCP is to allow purportedly low-risk herds to move cervids interstate. However, in 2018, a live CWD-positive white-tailed deer was moved interstate from Pennsylvania to Wisconsin, where it was shot in a high-fence facility and tested positive. The traceback to the origin of that animal identified another CWD-positive white-tailed deer in the same breeding herd. The HCP standards must undergo a significant change from the current model to adequately address disease transmission risks.

Recently, two of the largest urine product manufacturers began testing their products using a real-time quaking induced conversion (RT-QuIC), mirroring the technique that first identified CWD prions in urine. The RT-QuIC test is currently being evaluated by the USDA, and questions remain about the impacts of potential inhibiting compounds in the biofluids and uncertainty related to false positives in the testing process. Additionally, the company that is conducting the tests for the manufactures has not had its methodology verified by an independent laboratory, and neither the testing process nor any portion of the biofluid collection and scent manufacturing process is subject to governmental oversight. Should the RT-QuIC process be approved by USDA and the testing techniques be independently verified, urine product manufacturers have still not established a process to: (1) alert state and federal agricultural and wildlife agencies if prions are detected in their urine products, (2) prevent infectious products from being distributed to retailers, and (3) recall products that are already at retailers.

Lack of regulatory oversight and independence of commercial testing of cervid biofluid products, and lack of a recall process to prevent distribution of infected deer biofluid products represent a critical vulnerability.

#### **4. Economic Mismatch: Potential Permanent Cost to New Yorkers Outweighs Temporary Profits of Producers**



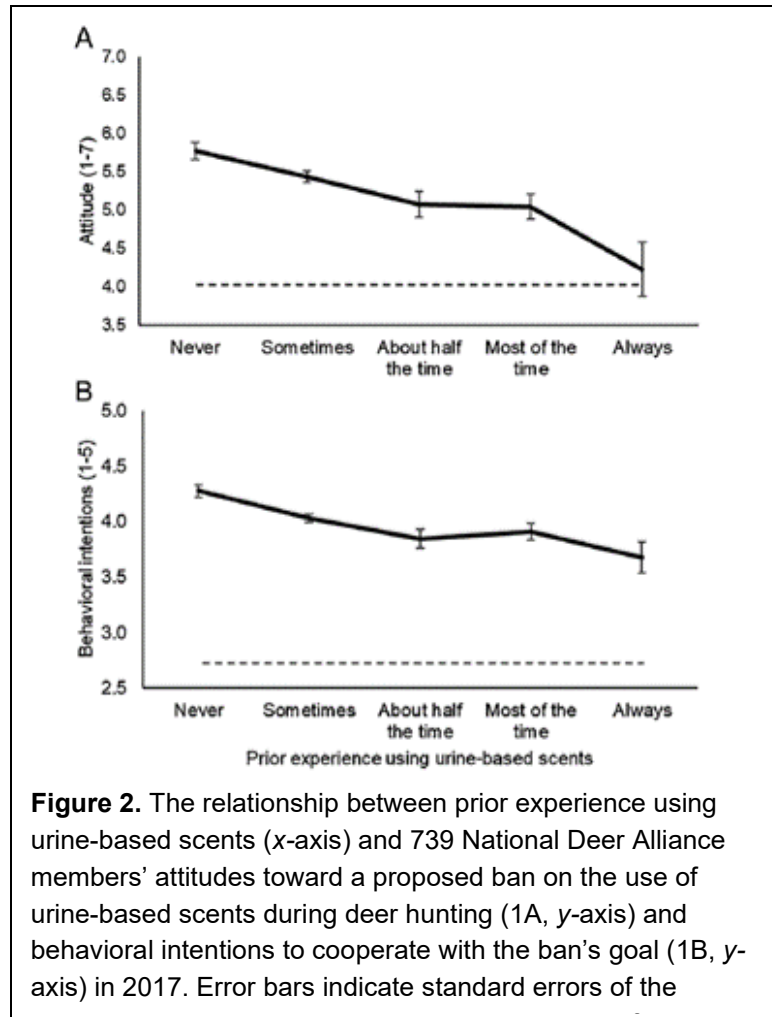
Should CWD prions be introduced to New York via infected biofluid products or other avenues, a CWD outbreak could have substantial impacts (>10% reduction) on hunting-associated income, particularly in rural areas (Bishop, 2004). The wild white-tailed deer herd in New York is valued at \$1.5B from license income, retail sales, jobs, food products, and recreational value.

In contrast, of the estimated 280 licensed captive cervid facilities in New York State, only 12 are known to collect urine (2012 survey). If New York were to initiate a ban on the retail sales, use, and possession afield of biofluid products, the owners of these 12 facilities would retain the ability to sell urine and biofluids wholesale to companies in other states. This action may have economic benefits for urine producers. For example, when New York State Department of Agriculture and Markets banned the live import of captive cervids in 2013, the economic value of New York captive white-tailed deer and elk was reported to have increased because of this extra margin of safety.

Potentially, as an increasing number of jurisdictions acknowledge the CWD risk associated with cervid biofluids and prohibit use of the products, the wholesale and retail markets for cervid biofluids may decline nationally. Nonetheless, synthetic urine products already represent over 20% of the current commercially available deer attractant options, providing a safer alternative for manufacturers and hunters.

##### 5. Hunter Opinions: Using Biofluid Attractants Is Not Worth the CWD Risk

Hunters' attitudes and behavioral intentions to comply with CWD related policies were tested in a hypothetical exercise using members of the National Deer Alliance (NDA, n=739), an online advocacy group of deer hunters (Song et al., 2018). Overall, participants held positive attitudes toward a proposed policy to ban deer-urine products and high intentions (89%) to cooperate. Participants also characterized CWD as an increasing risk that was well known to science, observable, and associated with dread. Notably, even those hunters who used deer-urine



**Figure 2.** The relationship between prior experience using urine-based scents (x-axis) and 739 National Deer Alliance members' attitudes toward a proposed ban on the use of urine-based scents during deer hunting (1A, y-axis) and behavioral intentions to cooperate with the ban's goal (1B, y-axis) in 2017. Error bars indicate standard errors of the

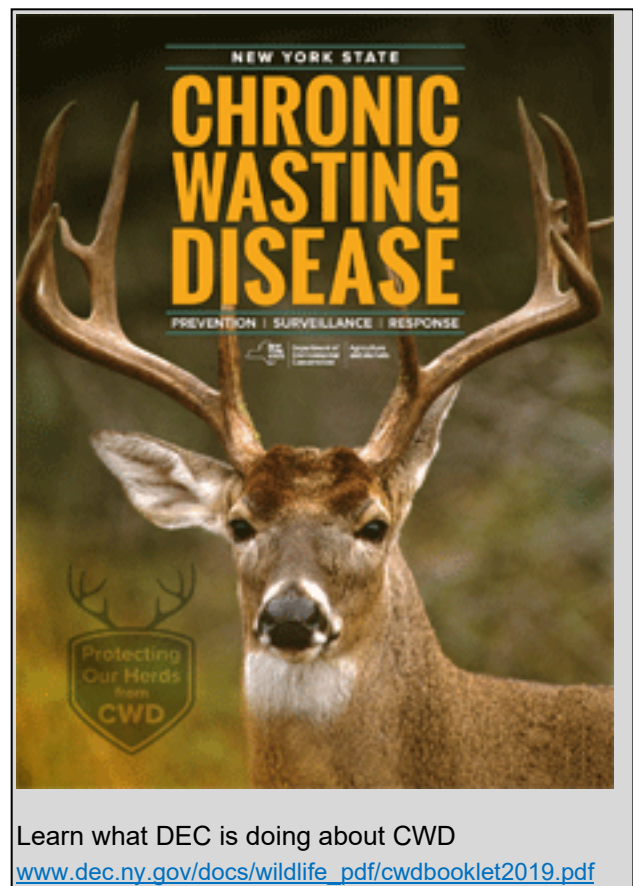
products relatively frequently had positive attitudes towards the ban and behavioral intentions to comply with the ban's goal (Figure 2; Song et al., 2018).

## 6. Recommendation

Based on available science, we contend that the use and distribution of cervid biofluid products continues to impose an unnecessary and avoidable risk of introduction and spread of CWD prions, which would irreversibly threaten the future of wild and captive cervids in New York. DEC acknowledges that efforts by the cervid biofluid industry to mitigate those risks are ongoing and subject to improvement. Should the uncertainty in testing reliability and deficiencies and lack of regulatory oversight in current cervid biofluid product distribution be resolved to address concerns related to prion detection, agency notification, and product recall, alternative approaches may be considered. In the absence of such improvements, we recommend that DEC consider steps to prohibit the retail sale, and possession, use, and distribution of cervid biofluid products in New York to eliminate this risk of CWD prion introduction.

## 7. Literature Cited

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<https://doi.org/10.1371/journal.pone.0023664>

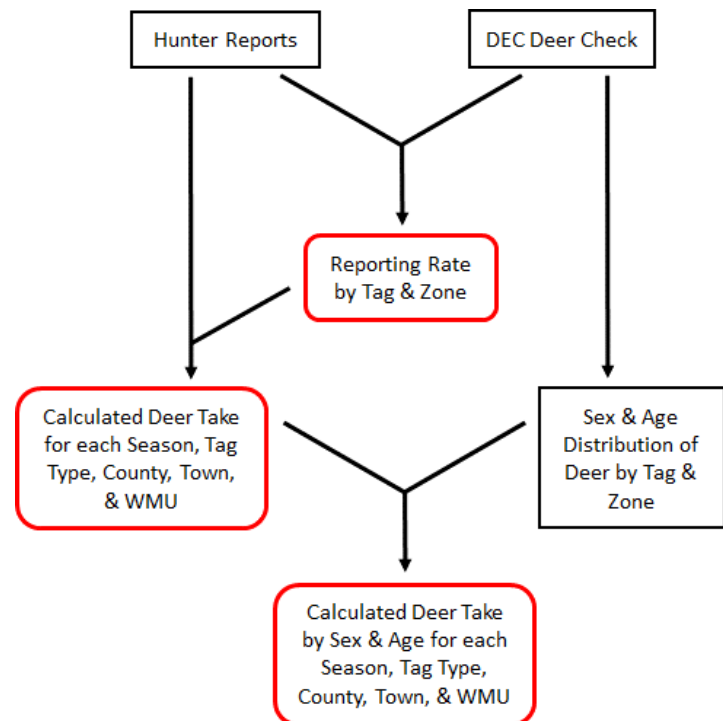


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## Appendix 4. Deer Harvest Calculation in New York

DEC calculates the annual deer harvest using data compiled from two primary sources: hunter reports and the physical examination of harvested deer by DEC staff. Successful hunters are required by law to report their deer harvest within 7 days and may do so via DEC’s automated phone report system, online, and mobile application. Additionally, DEC provides postcard report forms for hunters who do not possess a telephone. The harvest report includes information that is critical for the harvest calculation process (i.e., Hunter ID #, carcass tag #, season, and the town, county, and Wildlife Management Unit [WMU] of kill). The harvest report also includes information on the sex of the deer and number of antler points, but these data are used for law enforcement purposes, not harvest calculation.

The second source of deer harvest data is the physical examination (check) of 14,000–17,000 hunter-harvested deer each fall by DEC staff. This deer check occurs predominantly at venison-processing facilities and provides biological data about the harvest (i.e., sex and age of the deer, antler measurements, and other data as needed). Additionally, DEC staff record the deer carcass tag #, which is then compared against the hunter harvest reports to determine reporting rates. Data are also obtained from deer heads that are collected by DEC staff from venison processors and taxidermists for Chronic Wasting Disease (CWD) surveillance. Because we prioritize CWD samples from older age deer, data from these deer are not used to describe the age structure of the harvest as they would bias the outcome.



**Figure 1. Simplified illustration of the deer harvest calculation process in New York.**

After harvest data are compiled, they must be validated to identify erroneous records, such as those that contain incorrect town/county/WMU associations, spelling errors, impossible harvest dates, or tag errors such as an antlered male deer on a DMP tag. For simple data errors with obvious corrections, we fix the record. For others, the records are discarded. We then cross-reference all carcass tag numbers in the harvest report and deer check data files with a master list of tags issued to ensure only valid tags are included in the harvest calculation.

To calculate reporting rates (Figure 1), we compare DEC deer check records against hunter reports to identify the percentage of deer checked that were reported. We determine reporting rates for each tag type, calculating regional values when sample sizes are adequate (Table 1). We then apply the reporting rates to the appropriate records to estimate the total number of deer harvested, starting at the smallest spatial scale (town/county/WMU; e.g., Saranac/Clinton/5C) as this ensures that the calculated values will scale up consistently. After we calculate the harvest at the small scales, we sum the values for each town, county, WMU, zone, and state.

**Table 1.** Deer harvest reporting rates in New York, 2019.

Tag	Area	Hunter Reports	Checked by DEC	Checked & Reported	Percent Report
Regular Big Game	Northern	8,430	1,041	516	49.6
Regular Big Game	Southeast	10,964	2,491	1,421	57.1
Regular Big Game	Central & Western	22,737	4,471	2,357	52.7
DMP	Northern & Southeast	11,315	1,906	1,058	55.5
DMP	Central & Western	26,989	3,527	1,600	45.4
Bonus DMP	State	1,309	1,309	1,309	100.0
Bow & Muzzleloader	State	30,502	2,138	1,188	55.6
DMAP	State	7,778*			92.6*
Statewide Totals	State	118,715	15,574	8,140	52.3

\*DMAP reporting rates were determined from harvest reports submitted by DMAP permittees.

Once the number of deer harvested is estimated, we then use DEC deer check data to determine the sex and age composition of harvested deer (i.e., fawn male, fawn female, adult male, and adult female). Although hunters indicate the sex of deer in their harvest report, we rely on the physical examination of deer by DEC staff as a reliable sampling of harvested deer. By applying the age and sex distribution to the initial calculated totals, we can then describe the final deer harvest by sex and age for each tag type, season, and location (i.e., county, town, WMU) in New York.

## Methods

We use a Lincoln-Petersen model (Seber, 2002) to estimate the size of the annual deer harvest. We require three values to estimate the number (N) of harvested individuals: a known number of marked animals (M), a subset of the population that has been captured (C), and the number of marked animals within those captured (m).

$$\hat{N} = \frac{MC}{m}$$

For our use:

C = Total number of harvest report from hunters

M = Number of deer checked by biologists

m = Number of reported deer that were also checked

We can estimate the capture probability (i.e., reporting rate) using m and M.

$$\hat{p} = \frac{m}{M}$$

Once we have the reporting rate, we can apply that to C to estimate the total number of harvested individuals.

$$\hat{N} = \frac{C}{\hat{p}}$$

The appropriate sex and age distribution derived from DEC deer check is then applied to the estimated number for each tag type and geographic area.

## An Example

In northern and southeastern New York, DEC staff checked 1,906 deer taken on Deer Management Permits (DMPs; antlerless-only tags) in 2019. Hunters reported that they harvested 11,315 deer on DMPs in the same areas. Of those reported deer, 1,058 were both checked (marked) and reported.

$$\text{Reporting Rate} = \frac{1,058}{1,906} = 0.5551 \text{ or } 55.5\%$$

Of the 11,315 deer reported on DMPs in northern and southeastern NY, hunters reported 1,706 as having been taken in WMU 3M.

$$N = \frac{1,706}{0.5551} = 3,073 \text{ Deer taken on DMPs in WMU 3M}$$

Or

$$\hat{N} = \frac{1,906 * 1,706}{1,058} = 3,073$$

From the DEC deer check, we determine that the sex and age composition of deer harvested on DMPs in southeastern NY was 9.6% fawn male, 10.4% fawn female, 4.6% adult male, and 75.4% adult female. When this age and sex distribution is applied to the calculated DMP harvest of 3,073 deer in WMU 3M, it yields:

$$\text{Male Fawn} = 3,073 * 0.096 = 295$$

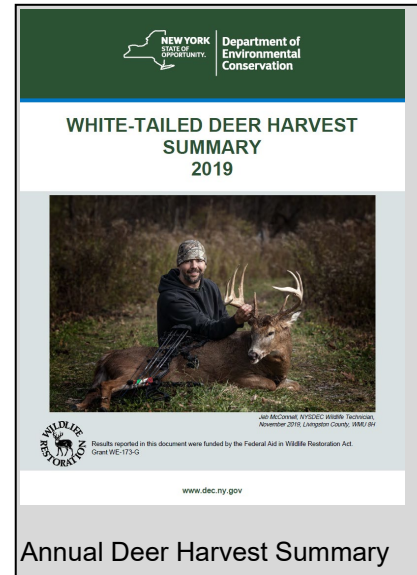
$$\text{Female Fawn} = 3,073 * 0.104 = 320$$

$$\text{Male Adult} = 3,073 * 0.046 = 141$$

$$\text{Female Adult} = 3,073 * 0.754 = 2,317$$

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## Appendix 5. Deer Management Permits: Setting Quotas and Allocating Tags

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Deer Management Permits (DMPs), often called "doe tags", are a critical part of New York's deer management program. By adjusting the number of DMPs available in individual Wildlife Management Units (WMUs), we can influence the number of does that are taken by hunters and thus manipulate the deer population toward desired levels. Annual removal of appropriate numbers of does is essential for ecologically responsible deer management. It is beneficial for sustaining biodiversity and maintaining healthy habitat and healthy deer.

### DMP Quota Setting

The math involved in setting DMP numbers is actually quite simple, though the process of determining the desired adult female (doe) harvest requires biologists to consider a variety of factors that influence population dynamics. Here is the essence of the permit quota-setting process:

**Step 1. Assess deer population status relative to the objective.** Deer population trajectory objectives (increase, stay the same, decrease) are assigned to each WMU based on public interests and assessments of deer-impacts to forests ([Appendix 2](#)). Biologists use adult buck harvest density (bucks taken per square mile of habitat) as an index of deer abundance within each WMU, and review trends in this index to determine whether the population is changing consistent with the objective. It's not quite as simple, though, as seeing that the buck take went up and assuming that the population must be increasing. Biologists also study previous levels of doe harvest and observe how they influenced recent buck harvests. We monitor indices of herd health and productivity through annual measurements of yearling antler beam diameters and fawn to doe harvest ratios, and we consider likely impact of winter conditions on deer survival based on the number of days with temperatures below zero and snow deeper than 15 inches. All of these factors weigh into the biologists' interpretation of whether or not the deer population is on track to meet the objective.

**Step 2. Determine desired doe harvest.** Based upon the deer population status assessment, DEC biologists decide whether additional, fewer, or roughly the same number of does need to be harvested during the next hunting season to modify population growth according to the WMU's objective. Biologists review recent trends in doe harvest and determine the desired total doe harvest.

**Step 3. Calculate the target doe harvest on DMPs.** Because does can also be harvested during bow and muzzleloader season and on DMAP tags, we review harvest records for each WMU to determine the desired doe harvest on DMPs.

$$(\text{Desired Total Doe Harvest}) - (\# \text{ Adult Does Taken by Muzzleloader Hunters and Archers and on DMAP tags}) = \text{Target Doe Harvest on DMPs}$$

**Step 4. Add in the expected fawn take.** All antlerless deer, including fawns and adult does, can be taken on DMPs, and the proportion of fawns in the harvest varies by WMU. Therefore, biologists review harvest records and adjust the desired DMP take to include fawns.

$$(\text{Target Doe Harvest on DMPs}) \div (\% \text{ Adult Doe in DMP Harvest}) = \text{Total Desired DMP Harvest}$$



**Step 5. Account for hunter success.** Not all of the DMPs issued result in a harvested deer, and that success rate varies by WMU. Biologists use past DMP harvest success to adjust the target DMP issuance level to ensure the desired number of antlerless deer and the desired number of does are harvested.

$$(\text{Total Desired DMP Harvest}) \div (\text{DMP Success Rate}) = \text{Total \# of DMPs to Issue}$$

**Example.** To illustrate the DMP quota setting process, consider the following:

- Step 1:** Population Trajectory Objective: *Stay the Same*  
Current Population Status: *Increasing, need additional adult female harvest*
- Step 2:** Recent Total Doe Harvest: 1,000 does; 2.0 per mi<sup>2</sup>  
Desired Total Doe Harvest: 1,250 does; 2.5 per mi<sup>2</sup>
- Step 3:** Recent Doe Harvest by Bow, Muzzleloader, and DMAP: 150  
Target DMP Doe Harvest = 1,250 – 150 = 1,100
- Step 4:** Percent Does of DMP Harvest (accounts for fawns): 70%  
Total Desired DMP Harvest = 1,100 ÷ 0.70 = 1,571
- Step 5:** Recent DMP Success Rate: 20%  
**Total # of DMPs to Issue** = 1,571 ÷ 0.20 = 7,855 rounded to **7,900**

## DMP Allocation

Quota setting is only the first part of the DMP process. The next step is to get the permits in the hands of our hunters. DMPs are issued by an instant selection process when hunters buy their license, allowing applicants who are selected for DMPs to receive their permits immediately. The system is designed to provide equal opportunity for a hunter regardless of whether they apply on the first or last day of the application period. The chances for DMP selection are determined by the DMP quota and the number of applications expected for each WMU. An applicant's chances of selection are also affected by their residency, qualification as a landowner of 50 or more acres, status as a veteran with disabilities, or the number of preference points accumulated through previous DMP applications. The order of priority for DMP selection is:

1. Landowners and Veterans with Disabilities
2. NYS Residents and Non-residents with 3 or more preference points
3. Residents with 2 preference points
4. Residents with 1 preference points
5. Residents with 0 preference points
6. Non-residents with 2 preference points
7. Non-residents with 1 preference points
8. Non-residents with 0 preference points

**Example.** To illustrate DMP issuance, consider the following simplified process. In reality, this process incorporates each category of residency and preference noted above.

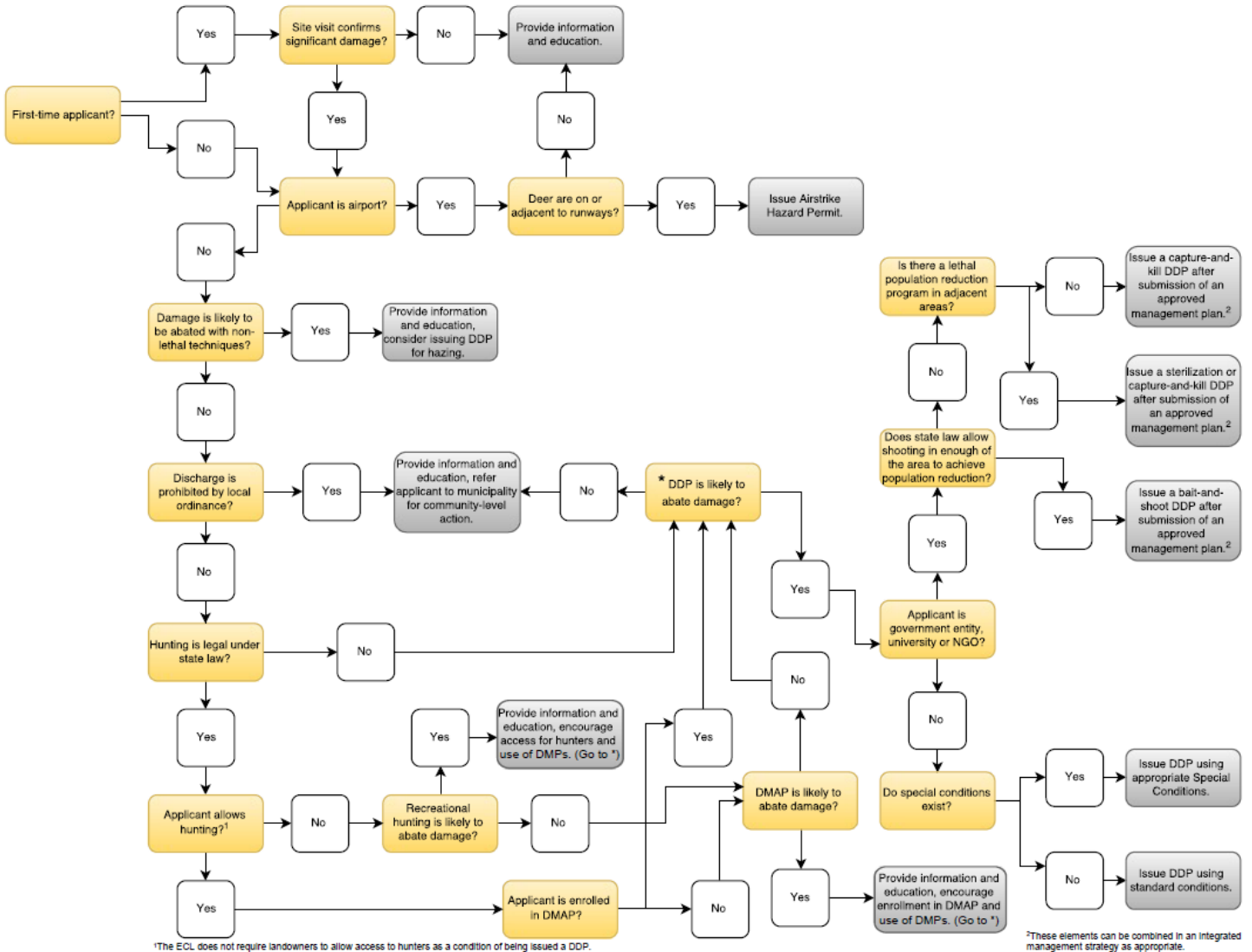
**DMP Target = 7,900**

<b>Landowners and Veterans with Disabilities</b>			
Expected # Applicants	Odds of Selection	Expected # DMPs to Issue	Expected # DMPs to Remain
100	100%	100	7,800
<b>Residents with Preference Points</b>			
Expected # Applicants	Odds of Selection	Expected # DMPs to Issue	Expected # DMPs to Remain
2,800	100%	2,800	5,000
<b>Residents without Preference Points</b>			
Expected # Applicants	Odds of Selection	Expected # DMPs to Issue	Expected # DMPs to Remain
8,000	62.5%	5,000	0

Actual DMP issuance is impacted by the overall number of people that apply for DMPs in a given WMU and their preference status, but we examine past application trends to predict application rates in each category for each WMU. If a WMU is substantially under-subscribed at the close of the initial application period (October 1 each year), DEC runs another random selection process for any hunters that were denied in that WMU during the initial period and mails tags to selected hunters. If necessary, the unit is opened for a first-come, first-served application period for leftover DMPs in November.

Hunters play an essential role in maintaining appropriate deer numbers in New York and our DMP system is the cornerstone of that process.

# Appendix 6. Deer Damage Complaint Evaluation Process



<sup>1</sup>The ECL does not require landowners to allow access to hunters as a condition of being issued a DDP.

<sup>2</sup>These elements can be combined in an integrated management strategy as appropriate.

## Appendix 7. Fertility Control of Deer

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Fertility control is often suggested or advocated by individuals and organizations as a humane way to control deer populations and reduce damages or conflicts associated with deer, especially in urban/suburban areas. However, despite decades of research on various fertility control methods, this approach has still not produced the solution people have been hoping for. Fertility control programs have resulted in deer population reduction only in fenced or island locations (Rutberg et al., 2013b). Because of the barriers to movement, there is little immigration of deer into such locations. In typical urban and suburban situations, however, deer move freely across municipal boundaries, so a fertility control program in such a situation would not be able to produce the desired population reduction. Every year, there would be untreated animals moving into the fertility control treatment area. Because of the high reproductive rate of deer, reproduction by a small number of untreated does can more than compensate for the low levels of mortality in these environments, resulting in continued population growth (Merrill et al., 2006).

However, fertility control may be useful in conjunction with other methods of population control (Raiho et al., 2015). A fertility control program may lead to population stability or reduction in a limited area if immigration from surrounding areas could be minimized. Substantially lowering the populations in those surrounding areas through hunting or culling programs would be a way to do that. Additionally, after a population has been lowered to an appropriate level through hunting or culling, it may be possible to maintain it at that level with fertility control. Even in these limited circumstances, though, the logistical and financial burdens entailed in current fertility control methods would present a significant obstacle to implementation of meaningful fertility control programs in most communities.

There are two basic methods of fertility control for deer: surgical sterilization and immunocontraception. Sterilization of does can be accomplished through either ovariectomy or tubal ligation. The former is preferable, because tubal ligation doesn't prevent ovulation, so does sterilized by that method will still go into estrus and mate. Because they won't get pregnant, however, they will go through several estrous cycles each year, creating an extended rutting season. This could have a number of negative consequences, including more deer-vehicle collisions, increased stress and lower overwinter survival, and an increase in the local population due to bucks being attracted from neighboring areas (Boulanger and Curtis, 2016). An ovariectomy program is not likely to have these consequences.

Unlike sterilization, immunocontraception does not provide permanent infertility. Booster doses at regular intervals are necessary to maintain effective contraception, although those intervals have been getting longer as the technology is improved. Does must be captured for initial treatment and marking, and subsequent doses require either recapturing the deer, or if regulations allow and the deer can be approached closely enough, darting with darts containing the contraceptive. Maintaining infertility becomes more difficult over time as the deer become more wary through experience.



The first deer contraceptive to be approved at a federal level by the Environmental Protection Agency (EPA) was GonaCon™. The EPA approval only allows it to be used by USDA APHIS Wildlife Services, state wildlife agencies, or people working under their authority. Administering GonaCon™ by dart is not allowed by the EPA because of the possibility that a dart might miss its target. GonaCon™ prevents ovulation and estrus, and a single injection has the potential to keep does infertile for multiple years. However, field tests have demonstrated relatively low efficacy rates, with 67–88% percent of treated deer not reproducing in the first year and 43–47% the second year (Gionfriddo et al., 2009; 2011). Additional information on GonaCon™ is available at [https://www.aphis.usda.gov/wildlife\\_damage/nwrc/downloads/faq\\_gonacon\\_07.pdf](https://www.aphis.usda.gov/wildlife_damage/nwrc/downloads/faq_gonacon_07.pdf) and [https://www3.epa.gov/pesticides/chem\\_search/reg\\_actions/registration/fs\\_PC-116800\\_01-Sep-09.pdf](https://www3.epa.gov/pesticides/chem_search/reg_actions/registration/fs_PC-116800_01-Sep-09.pdf).

In 2017, the EPA approved another contraceptive for deer, ZonaStat-D. It contains porcine zona pellucida (PZP), which prevents fertilization, not ovulation, so it has the same potential for negative consequences as tubal ligation. The EPA approval only allows ZonaStat-D to be used by certain federal and state government agencies, Native American tribes, and the Humane Society of the United States. More information is available at [https://iaspub.epa.gov/apex/pesticides/f?p=PPLS:8:3786503592210::NO::P8\\_PUID,P8\\_RINUM:498850,86833-1](https://iaspub.epa.gov/apex/pesticides/f?p=PPLS:8:3786503592210::NO::P8_PUID,P8_RINUM:498850,86833-1). PZP formulations that may provide multiple years of infertility have been developed, and their efficacy on free-ranging deer is currently being tested in a field study in New York. Previous tests suggest that efficacy rates are higher than those of GonaCon™ (Rutberg et al., 2013a).

Neither of these products has been registered for use in New York State, so deer can only be treated with them as part of a scientific study. DEC will only consider proposals to use immunocontraceptives on deer if they represent research designed to answer new and worthwhile scientific questions. The research project must be thoroughly described in a full scientific proposal. If such a project is approved, a License to Collect and Possess will be issued that allows treatment of the deer. Application forms and more information are available at <http://www.dec.ny.gov/permits/28633.html>.

Fertility control efforts typically focus on female deer. Because one buck can fertilize many does, to achieve a given change in population reproductive rate, a program focusing on bucks would have to treat a much higher proportion of the total number than a program focusing on does would. Nevertheless, there is currently a research project in New York investigating whether buck sterilization (by vasectomy) can reduce population size in an island setting.

Sterilization of does may be included as one component of a community deer management program under a Deer Damage Permit, provided that methods that effectively reduce deer populations are also included. For example, sterilization could be used in a village center where buildings are very close together, while hunting is employed in surrounding parts of the community that have a lower density of development. Hunting would be necessary to lower deer abundance, but sterilization could provide a valuable contribution to the overall program by preventing reproduction in a segment of the population that is very difficult for hunters to access. For more information on community deer management, see <http://www.dec.ny.gov/animals/104961.html>.

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## Appendix 8. Legal Matters

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Deer management and deer hunting activities in New York occur within the legal framework of the New York State Environmental Conservation Law (ECL). The ECL grants DEC authority to establish 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 and deer hunting, including relevant laws. Rather, the State Legislature, as the lawmaking body, enacted the ECL, which provides DEC with the authority to adopt regulations for many aspects of deer management, such as the length and timing of hunting seasons, bag limits, Wildlife Management Unit boundaries, the Deer Management Assistance Program, disease response, and feeding prohibitions. However, many other aspects of deer management and hunting are established in law, including the use of crossbows, counties where rifles may be used, age limits for hunting, methods for culling deer, license fees, and penalties for violations. DEC may only promulgate regulations consistent with the underlying statute.

While DEC can create and modify regulations, new laws or changes to existing laws require initiation and approval first by the New York State Legislature and then by the Governor. As an executive agency, DEC has opportunity to work directly with the Governor's office to recommend legislation, through the Departmental process, or as part of the Governor's Executive Budget if appropriate. DEC is available to assist members of the Legislature and their constituents with questions and concerns; however, DEC can neither direct the Legislature to act nor comment on pending legislation.

The following section outlines several issues for which modification of the ECL may improve deer management efficacy and remain consistent with the public's interest for deer management and hunting.

### **1. Improve capacity to address overabundant deer in urban and suburban areas.**

Efforts to address the problem of overabundant deer in urban and suburban areas require flexibility and the availability of non-traditional management techniques. Many current statutes in the ECL were established during periods of deer scarcity, without anticipation of current issues associated with deer abundance. As such, numerous prohibitions in the ECL, implemented to protect a limited resource, now substantially hamper DEC's capacity to manage overabundant deer, and thereby perpetuate and exacerbate the negative deer-related impacts that communities and landowners experience.

To effectively assist communities in addressing situations of deer overabundance, DEC essentially needs an expanded toolbox. Having additional legal authorities (tools) would enable the development of strategic programs tailored to individual communities' needs and would increase the efficiency and effectiveness of their programs.

With respect to deer hunting, statutes should be modified to grant DEC full regulatory authority to:

- set deer hunting seasons and regulate methods of take and bag limits in all parts of the state, not just a subset of the state. This would include:
  - allowing use of firearms to take deer during the regular season and eliminating acreage minimums and special season constraints in Suffolk and Westchester Counties (ECL § 11-0907),
  - full authority to regulate crossbow use (ECL § 11-0505),

- allowing deer hunting in currently closed areas (e.g., Nassau County and parts of Albany, Erie and Monroe Counties; ECL § 11-0907),
- allowing use of firearms to take deer in areas that are currently restricted to bow only;
- allow hunters in urban deer control areas to use some techniques that are prohibited under general hunting laws (e.g., bait, lights; ECL § 11-0901); and
- set conditions under which hunters can receive some form of compensation for killing deer and can sell venison (ECL § 11-0917).

State law also sets the parameters on what DEC can authorize for removal of deer under a damage permit, or culling. Numerous constraining laws prevent the authorization of deer-removal techniques that can be very safe and effective under controlled circumstance. These laws were originally established to increase public safety associated with general firearms use and hunting practices by the public. However, by hindering the removal of deer that are creating public safety hazards in developed areas and at airports, the laws actually increase risk to the public. Statutes should be modified to give DEC the flexibility to issue permits that allow qualified professionals, under controlled circumstances, to:

- use bait within 300' of a road (ECL § 11-0505),
- shoot from a vehicle (ECL § 11-0931),
- discharge firearms within 500' of a dwelling or structure (ECL § 11-0931),
- use firearms equipped with sound suppression (ECL § 11-0931), and
- use rifles in Suffolk and Westchester counties (ECL § 11-0931).

These techniques would greatly increase the efficiency and even the safety of culling programs. Rifles are more precise firearms than shotguns, and sound suppression can improve professionals' ability to take multiple deer from a group. When working from an elevated platform in the back of a truck, professionals are able to discharge their firearms in a safe, downward trajectory and move efficiently between shooting locations without altering deer behavior. Use of bait within 300' of a road allows professionals to establish shooting sites in the safest locations and remove deer from a higher portion of open spaces.

Additional details on the statute changes that could improve management of overabundant deer in developed areas of the state are available in DEC's report to the New York State Legislature, *Deer Management in Urban and Suburban New York* ([www.dec.ny.gov/docs/wildlife\\_pdf/decdeerreport18.pdf](http://www.dec.ny.gov/docs/wildlife_pdf/decdeerreport18.pdf)).

**2. Set uniform minimum hunting age of 12 years, with supervision of a licensed, experienced adult.**

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, 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, all other states allow youths 12 years old or younger to hunt big game with a firearm, and most states have no set minimum age for youths when hunting with an adult mentor. Moreover, in New York, 12-year-olds have been allowed to hunt small game with a firearm while accompanied by an adult since 1991. DEC strongly recommends that the minimum age for youth to hunt with a firearm or crossbow be set to a uniform age of 12 years for all game species, including big game, with associated adult supervision.

Additionally, DEC considers the current requirement for junior hunters and their mentors to remain on the ground while hunting with a firearm to be unnecessary. Twelve- and 13-year-old junior bowhunters are currently allowed to hunt from an elevated position, and discharge of a firearm from an elevated platform increases safety with downward bullet trajectory. Most tree stand-related accidents are associated with movement into and out of the stand, not with the implement used for hunting. Tree stands designed for two hunters are widely available.

### **3. Crossbow hunting**

DEC supports the use of crossbows for deer hunting during the same time frames, in the same manner, and with the same eligibility requirements as with vertical bows.

The crossbow hunting law enacted in 2012 does not address deer management needs and is inconsistent with hunter preferences. Specifically, overabundant deer populations in portions of the state where hunting access or firearm use is restricted, such as Suffolk and Westchester counties and WMUs 4J and 8C in Albany and Monroe counties respectively, may cause serious impacts on forest regeneration, biodiversity protection, and public health. However, current law expressly prohibits crossbow use in these areas. Moreover, limited time for crossbow use and the arbitrary difference in the legal setback distances for discharge of vertical bows (150 feet from certain structures) and crossbows (250 feet) unnecessarily constrain effective use of crossbows for deer management throughout the state.

Support for increased crossbow use appears to be growing among New York hunters. A 2010 survey of hunters found that a majority of deer hunters supported crossbow use for all hunters during seasons when other bowhunting equipment is allowed (51%) and more so for seniors (68%) and hunters with disabilities (78%; Enck et al., 2011). In a 2018 survey, DEC found that 61% of respondents who do not own a crossbow would acquire and use a crossbow for hunting if crossbows were allowed during the entire bow season. Further, a majority (61%) preferred that crossbow use be tied to bowhunting privileges, and a similar majority (60%) of hunters indicated that crossbows should be allowed in Suffolk and Westchester counties and in WMUs 4J and 8C.

DEC recommends that crossbows be allowed during all hunting periods when other bowhunting equipment is allowed and that eligibility to hunt with a crossbow be the same as eligibility to hunt with a vertical bow. DEC further recommends that the restrictions on crossbow size (e.g., minimum limb width) and maximum draw weight be removed from law so that the agency can set more appropriate standards which are effective and humane for deer hunting and consistent with crossbow technology.

### **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. Reducing the constraints on hunters is 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][c]), 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 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 town hunting permit and landowner endorsement requirements and 10-acre-minimum property size restriction:** 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 current law allows towns to opt out of the town permit requirement, but landowner endorsements and 10-acre-minimum property restrictions still apply. These requirements are cumbersome for hunters, municipalities, and DEC, and are inconsistent with hunting requirements elsewhere in New York. Elimination of these requirements will reduce the regulatory burden on hunters while still allowing effective deer and hunter management.
- **Allow firearms hunting for more than the January firearms season:** Suffolk County has some of the most severe and widespread deer-related problems in the state and has very limited firearms hunting opportunity. Bowhunting is not effective enough to achieve the needed deer population reduction. Expanding the firearms season to match or exceed firearms seasons in the rest of the state would enable hunters to provide more relief to Suffolk County residents suffering problems caused by overabundant deer.

***Special opportunity for junior hunters:***

The special youth weekend that allows 14- and 15-year-olds to hunt deer with firearms in most of the state has been popular and successful but providing a similar opportunity for junior hunters on Long Island is not allowed by current law. A youth hunt opportunity could and should be created on a weekend prior to the firearms season to provide teenagers in the downstate area access to the same outdoor opportunities as their upstate counterparts.

**5. Prohibit wanton waste of harvested game.**

While thankfully not common practice, it is currently legal in New York to shoot game animals and abandon the carcasses without using any part of them, or to take the antlers or head of a deer and leave the meat to rot. Such waste is contrary to the tenets of the North American Model of Wildlife Conservation and generally accepted hunting ethics. It also tarnishes the image of hunters and

hunting in the eyes of the non-hunting public. Many states have laws prohibiting such waste and establishing penalties for violating the prohibition. In keeping with our mandate to manage the natural resources of the state for the benefit of current and future generations, DEC believes that New York should require game animals that have been shot to be retrieved by the hunter if at all possible and thoroughly utilized.

**6. Remove the prohibition on big game hunting in certain parts of Albany, Erie, Herkimer, and Hamilton counties: ECL § 11-0907.**

For reasons no longer known or relevant, the ECL prohibits deer and bear hunting along the southern, western, and northern edge of Big Moose Lake in Herkimer County and the immediate lands surrounding the Fulton Chain Lakes between Old Forge and Inlet in Herkimer and Hamilton counties. Though these areas include a relative high density of camps and homes, they reflect the landscape of many Adirondack lakes and hamlets and also include large areas of forested land. Deer and bear readily use the space, and conflicts with deer and bear are routine, particularly in the Old Forge-Inlet corridor. Removing the prohibition of big game hunting in these areas would allow hunters to help control these problems in a safe manner as occurs within and around communities across New York State.

Similarly, the ECL prohibits deer and bear hunting on the watershed property surrounding the Alcove Reservoir in Albany County. Consequently, excessive deer numbers have over-browsed the forest, compromising the watershed protection the forest is intended to provide. The Albany Water Board and Albany Water Department has sought to reduce deer numbers on the watershed lands by using volunteer cooperators to take deer under the authority of a DEC-issued Deer Damage Permit (DDP). However, DDPs are not a long-term solution, and the Albany Water Board and DEC recommend that the statutory prohibition of deer and bear hunting on these lands be rescinded.

Finally, the ECL also prohibits deer and bear hunting in a portion of Erie County known as WMU 9C. As a result, deer numbers have become excessive, threatening public safety from deer-vehicle collisions, causing costly damage to landscape and agricultural plantings, and compromising the ecological health of local parks and preserves. In addition, with the recent surge in tick-borne disease awareness, many communities wish to lower deer numbers with the hopes of reducing and minimizing the spread of Lyme disease. Because statute prohibits otherwise lawful regulated deer hunting in this area, several municipalities have implemented deer-cull programs to reduce deer-related impacts, under authority of DEC-issued DDPs and at the expense of local taxpayers. However, these cull programs are not conducted uniformly across the area, and thus have a limited effect at managing overall deer abundance. Allowing for regulated hunting, as occurs in other urban and suburban areas throughout the state, will reduce the effort and expense needed for the cull programs. Additionally, deer harvest by hunters in areas not included in a deer cull program will reduce negative impacts and potentially prevent a cull program from being needed. Hunters must abide by minimum setback distances from structures for discharge of hunting equipment, and this, together with required education on hunting safety, has proven that regulated hunting can very safely be conducted in greenspaces of developed environments. For these reasons, DEC recommends that the statutory prohibition of deer and bear hunting within portions of Erie County be rescinded to enable the DEC to safely and effectively manage deer within all of the county, including WMU 9C.

DEC recommends removing subdivisions 5(b-e) and 6 of ECL § 11-0907.

**7. Allow DEC to regulate buck harvest standards: rescind ECL § 11-0914.**

The ECL grants DEC authority to set regulations for most deer hunting seasons and the way hunters may take deer, and DEC has established hunting frameworks that are appropriate for management and responsive to the public's interests. Responding to sociopolitical interests, DEC also used this authority to create a mandatory antler restriction program to reduce harvest of small-antlered bucks in 11 WMUs in southeastern New York. However, in 2011, the New York State Legislature adopted a law (ECL § 11-0914) that codified a mandatory antler point restriction in a portion of WMU 3A. ECL § 11-0914 was and is unnecessary, as WMU 3A is part of DEC's existing antler restriction program. This law imposes a management measure that is best addressed through DEC regulation. As deer management objectives and hunter values change, DEC can adapt program changes through regulatory amendments more nimbly than statutory amendments. In addition, having unique deer hunting rules in statute for a single WMU, or as in this case, a portion of a WMU, unnecessarily complicates hunting rules, compromises DEC's deer management capacity, and reduces DEC's ability to be responsive to public interests.

**8. Allow Deer Management Permits throughout the Northern Zone.**

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. However, in large portions of northern New York, DEC is not authorized to issue DMPs, and antlerless harvest can only occur in those areas during bowhunting and muzzleloader seasons. Adjusting antlerless harvest to meet management objectives requires regulation changes to the muzzleloader or bowhunting seasons. This process is cumbersome, less responsive to changing management conditions, and less equitable for hunters. DEC should have authority to manage antlerless harvest with DMPs throughout the entire Northern Zone.

**9. Create incentives for landowners to allow public hunting.**

The amount of private land with open public hunting access has decreased in recent decades. In addition to making hunting more difficult and potentially less enjoyable, this can compromise efforts to manage deer populations at sustainable levels, as unharvested or underharvested land prevents uniform harvest of deer across the landscape. As stated earlier in the plan, unharvested properties provide refuge for deer, thus not exposing those deer to an important source of mortality necessary for population management. One idea to change this situation would be to create a program in law that reduces property taxes or provides a state tax credit for landowners who allow access to their properties for hunters and other recreationists.

