

ENVIRONMENTAL ASSESSMENT

WHITE-TAILED DEER DAMAGE MANAGEMENT IN NEW YORK

Lead Agency: United States Department of Agriculture (USDA)
Animal and Plant Health Inspection Service (APHIS)
Wildlife Services (WS)

Cooperating Agencies: New York State Department of Environmental Conservation
Division of Fish, Wildlife and Marine Resources
Bureau of Wildlife

New York State Office of Parks, Recreation, and Historic Preservation

New York City Department of Parks and Recreation

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EXECUTIVE SUMMARY

Wildlife Services chose to prepare this EA to facilitate planning, interagency coordination and the streamlining of program management, and to clearly communicate with the public the analysis of individual and cumulative impacts in managing deer damage across the State of New York. The EA describes the need to manage white-tailed deer and other cervids to reduce and prevent damage associated with these animals in New York; the potential issues associated with managing damage caused by white-tailed deer and other cervids; and the environmental consequences of conducting different management alternatives. The damage caused by white-tailed deer in New York is often caused by the overabundance of these animals, primarily in urban and suburban environments, where traditional legal hunting programs face many obstacles for effective management of deer populations. Wildlife Services would conduct most deer damage management projects in urban or suburban environments and properties where access to the general public is limited due to safety or security concerns.

White-tailed deer (*Odocoileus virginianus*), and escaped or confined domestic deer, defined as red deer, fallow deer, sika deer, domestic white-tailed deer, elk, or other non-native cervids, may have many positive values but they can also cause damage to property, agricultural resources, natural resources, and pose risks to human health and safety. This EA analyzes the potential environmental impacts of alternatives for United States Department of Agriculture, Animal and Plant Health Inspection Service, Wildlife Services (WS) response to deer damage and conflicts with deer in New York. Actions proposed in the EA could be conducted on public and private property in New York when the resource owner (property owner) or manager requests assistance, a need for action is confirmed, and agreements specifying the nature and duration of the activities to be conducted are completed. This analysis is prepared in cooperation with the New York State Department of Environmental Conservation, Bureau of Wildlife (NYSDEC). The NYSDEC has regulatory authority to manage populations of white-tailed deer.

NEED FOR ACTION:

White-tailed deer movement and browsing activities may result in losses to airports, private property, agricultural resources, natural resources, and human health and safety. Crop damage, tick borne diseases, excessive browsing of ornamental plantings, changes in natural ecosystems and vegetation, and deer-vehicle collisions are frequently prime factors taken into consideration.

Airports provide ideal conditions for white-tailed deer due to the large open grassy areas adjacent to brushy, forested habitat used as noise barriers, and are a significant safety concern to aircrafts because of their abundance, behavior, and large body size which damage aircraft in most aircraft strikes. Of all wildlife species, deer are ranked as the most hazardous to aircraft, especially to smaller general aviation aircraft (Dolbeer et al. 2000), and they represent a serious threat to human health and safety. White-tailed deer can also damage private property such as landscaping and ornamental plantings. Furthermore, deer are prolific and adaptable, characteristics which allow them to exploit and prosper in most suitable habitat near urban areas, including residential areas (Jones and Witham 1990). White-tailed deer can cause damage to a wide variety of agricultural resources, including row crops, forage crops, vegetables, fruit trees, nursery stock, ornamentals, and stored hay (Craven and Hygnstrom 1994). In addition to the immediate losses, there may be residual damage in the form of future yield reduction for fruit trees or forage crops, and ornamental trees or nursery stock may be permanently disfigured by deer browsing (Craven and Hygnstrom 1994). Although browsing is the most common type of agricultural damage, deer may also damage crops by trampling or antler rubbing (Dolbeer et al. 1994). Deer overabundance can also

affect native vegetation and natural ecosystems. Numerous studies have shown that overbrowsing by deer can decrease plant growth, survivorship, and reproduction (Boerner and Brinkman 1996, Waller and Alverson 1997, Ruhren and Handel 2003) and can affect understory vegetation cover, plant density, or plant diversity (Warren 1991). Finally, zoonoses (*i.e.*, wildlife diseases transmissible to people) are a major concern of cooperators when requesting assistance with managing threats from white-tailed deer. Disease transmission could occur from direct interactions between humans and white-tailed deer or from interactions with pets and livestock that have direct contact with wild white-tailed deer. Public awareness and health risks associated with zoonoses have increased in recent years, and a need for disease surveillance and monitoring has been established. Wildlife Services may need to sample deer harvested in cooperation with state wildlife and/or agriculture agencies during the annual hunting season or other damage management programs to monitor for disease (*i.e.*, Chronic Wasting Disease, tuberculosis)

DECISIONS TO BE MADE:

Based on agency relationships, Memorandums of Understanding (MOUs), and legislative authorities, WS is the lead agency for this EA, and therefore, responsible for the scope, content, and decisions made. The NYSDEC is the state agency responsible for managing wildlife in the State of New York. Wildlife Services' activities to reduce and/or prevent white-tailed deer damage in the state would be coordinated with the NYSDEC to ensure that actions were consistent with population goals established for white-tailed deer. Extensive literature review and discussion with entities involved in the management of white-tailed deer were used to identify potential management strategies.

ISSUES IDENTIFIED:

Issues are concerns of the public and/or professional community raised regarding potential adverse effects that might occur from a proposed action, and must be considered in the NEPA decision making process. Six issues were identified that were analyzed in detail: effects of damage management activities on white-tailed deer populations; effects of damage management activities on non-target plant and wildlife species including T&E species; effects of damage management activities on human health and safety; effects on the socio-cultural elements of the human environment; humaneness and animal welfare concerns of methods; and effects of damage management activities on the regulated harvest of white-tailed deer. Ten other issues were identified but were not considered in detail, and rationales were provided.

ALTERNATIVES FOR ADDRESSING THE NEED FOR ACTION:

Alternatives examined in the EA include an alternative in which WS continues the current white-tailed deer management program (the "no action" alternative and proposed action alternative); an alternative in which WS is restricted to providing technical assistance only; and an alternative in which no white-tailed deer damage management is conducted by WS. Six additional alternatives were identified but were not considered in detail, and rationales were provided. The first alternative considered, the proposed alternative, is for WS and the cooperating agencies to continue a white-tailed deer management program that includes the use of the full range of legal non-lethal and lethal damage management techniques. Landowners and managers requesting assistance would be provided with recommendations and information regarding the use of effective non-lethal and lethal techniques. Non-lethal methods recommended and used by WS may include physical exclusion, habitat management, supplemental feeding, animal behavior modification, live capture and translocation when part of an

approved deer population restoration program, chemical pesticides, or sterilization (Appendix B). Lethal methods recommended and used by WS may include the use of shooting, hunting, and live capture and euthanasia (Appendix B). All WS activities would continue to be conducted in accordance with applicable state, federal, and local laws and regulations.

An overview of the purpose and need for action related to damage white-tailed deer could cause to New York's resources are described in Chapter 1. Issues which may affect the implementation of a management program involving federal resources are identified in Chapter 2. Detailed descriptions of the specific management alternatives are provided in Chapter 3 of the environmental assessment. Environmental consequences for issues analyzed in detail, including direct, indirect, and cumulative impacts, are provided in Chapter 4. A summary of methods available to WS for use in resolving or preventing white-tailed deer damage is included in Appendix B.

The proposed action/no action alternative would continue the current implementation of an adaptive integrated approach utilizing non-lethal and lethal techniques, when requested, as deemed appropriate using the WS Decision Model, to reduce damage and threats caused by white-tailed deer in New York. A major goal of the program would be to resolve and prevent damage caused by white-tailed deer and to reduce threats to human safety. To meet this goal, WS, in consultation the NYSDEC, would continue to respond to requests for assistance with, at a minimum, technical assistance, or when funding was available, operational damage management. The adaptive approach to managing damage associated with white-tailed deer would integrate the use of the most practical and effective methods to resolve a request for damage management as determined by a site-specific evaluation to reduce damage or threats to human safety for each request. City/town managers, agricultural producers, property owners, and others requesting assistance would be provided information regarding the use of appropriate non-lethal and lethal techniques.

Under this alternative, WS could respond to requests for assistance by: 1) taking no action, if warranted, 2) providing only technical assistance to property owners or managers on actions they could take to reduce damages caused by white-tailed deer, or 3) providing technical assistance and direct operational assistance to a property owner or manager experiencing damage. The take of white-tailed deer can only legally occur through the issuance of a permit by the NYSDEC and only at levels specified in the permit.

Property owners or managers requesting assistance from WS could be provided with information regarding the use of effective and practical non-lethal and lethal techniques. Preference would be given to non-lethal methods when practical and effective under this alternative (see WS Directive 2.101). Property owners or managers may choose to implement WS' recommendations on their own (*i.e.*, technical assistance), use contractual services of private businesses, use volunteer services of private organizations, use the services of WS (*i.e.*, direct operational assistance), take the management action themselves, or take no further action.

WS would work with those persons experiencing white-tailed deer damage in addressing those white-tailed deer responsible for causing damage as expeditiously as possible. To be most effective, damage management activities would occur as soon as white-tailed deer begin to cause damage. White-tailed deer damage that has been ongoing can be difficult to resolve using available methods since white-tailed deer would be conditioned to an area and would be familiar with a particular location. Deer damage can be difficult to resolve if people wait until damage is at crisis levels before implementing abatement activities or seeking assistance. Subsequently, making that area unattractive using available methods could be difficult to achieve once damage was ongoing. Wildlife Services

would work closely with those entities requesting assistance to identify situations where damage could occur and begin to implement damage management activities under this alternative as early as possible to increase the likelihood of those methods achieving the level of damage reduction requested by the cooperating entity.

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ACRONYMS

AMDUCA	Animal Medicinal Drug Use Clarification Act
APHIS	Animal and Plant Health Inspection Service
AVMA	American Veterinary Medical Association
CDC	Centers for Disease Control and Prevention
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
DEA	Drug Enforcement Administration
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FDA	Food and Drug Administration
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FR	Federal Register
FSIS	Food Safety and Inspection Services
FY	Fiscal Year
IV	Intravenous
IC	Intracardiac
MOU	Memorandum of Understanding
NASS	National Agricultural Statistics Service
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NWRC	National Wildlife Research Center
NYSDAM	New York State Department of Agriculture and Markets
NYSDEC	New York State Department of Environmental Conservation, Bureau of Wildlife
NYCDPR	New York City Department of Parks & Recreation
SOP	Standard Operating Procedure
T&E	Threatened and Endangered
USC	United States Code
USDA	U.S. Department of Agriculture
USDI	U.S. Department of Interior
USFWS	U.S. Fish and Wildlife Service
WS	Wildlife Services

CHAPTER 1: PURPOSE AND NEED FOR ACTION

1.1 PURPOSE

The United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Wildlife Services (WS)¹ program in New York has received and continues to receive requests for assistance to resolve or prevent damage occurring to agricultural resources, natural resources, property, and threats to human safety associated with wild white-tailed deer (*Odocoileus virginianus*). Wildlife Services anticipates receiving future requests for assistance with these issues. Wildlife Services chose to prepare this EA to facilitate planning, interagency coordination and the streamlining of program management, and to clearly communicate with the public the analysis of individual and cumulative impacts in managing deer damage across the State of New York. In addition, this EA has been prepared to evaluate and determine if there are any potentially significant or cumulative impacts from the proposed and planned damage management program. EAs are conducted at the state level because the most data is available at this level, and more localized analyses are not being conducted because the level of deer removal conducted by WS will not impact overall statewide population.

White-tailed deer are an important natural resource in New York for aesthetics and legal hunting which adds to the quality of life for many people who live in New York. The State of New York manages deer and other wildlife populations to ensure that populations in New York are of appropriate size to meet demands placed on those populations; to ensure that public desire for information sharing about wildlife is met; to ensure that sustainable uses of New York's wildlife are provided; and to minimize the damage and nuisance caused by wildlife and wildlife uses (NYSDEC 2011a). However, in some jurisdictions of New York legal hunting is unable to regulate deer populations to satisfactory levels of deer damage. To ameliorate deer damage in these jurisdictions, the state issues several deer damage type permits to allow hunters, landowners, and agents to legally harvest additional deer. The jurisdictions where higher levels of unacceptable deer damage tend to be found are the urban/suburban interface. For example, while hunting is successful in most jurisdictions of New York at reducing deer populations annually to meet management goals, other jurisdictions such as Suffolk, Nassau and Westchester Counties and New York City, parts of Tompkins, Albany, Monroe, Onondaga, Erie, and Broome Counties have reoccurring annual deer population issues that must be addressed with management methods to supplement hunting. Finally, there are smaller localized deer damage issues (i.e., farms, airports, safety zones) across New York where deer are managed with various deer harvest type permits to supplement legal hunting or to reduce deer damage to acceptable levels. Wildlife Services can provide technical assistance and/or operational management to resolve deer damage. However, WS needs to be requested in order to work on deer damage management, and WS needs to operate under a permit issued to a landowner by the New York State Department of Environmental Conservation, Bureau of Wildlife (NYSDEC).

The purpose of this Environmental Assessment (EA) is to enable WS to effectively manage damage and threats to agricultural resources, natural resources, property, and threats to human safety caused by wild white-tailed deer and escaped or confined domestic deer, (defined as red deer, fallow deer, domestic white-tailed deer), elk, or other non-native cervids. While this EA is concerned primarily with management of damage caused by wild deer, we will also analyze damage caused by escaped or confined domestic deer. In this EA, wild white-tailed deer will be referred to as white-tailed deer or deer.

This EA will assist in determining if the proposed management of wild white-tailed deer damage would have a significant impact on the environment based on previous activities conducted by WS and based on the anticipation of conducting additional efforts to manage damage caused by those species. It is conceivable that additional damage management efforts would occur as the goal of WS would be to conduct a coordinated program to alleviate wild white-tailed deer damage in accordance with plans, goals, and objectives developed to reduce damage, and because the program's goals and directives¹ would be to provide services when requested, within the constraints of available funding and workforce. Thus, this EA anticipates those additional efforts and the analyses would be intended to apply to actions that may occur in any locale and at any time as part of a coordinated program. The analyses contained in this EA are based on information derived from WS' Management Information System, published documents (see Appendix A), interagency consultations, public involvement, and a previous EA developed by WS in (USDA 2003).

The EA evaluates the need for action to manage damage associated with white-tailed deer in the state, the potential issues associated with white-tailed deer damage management, and the potential environmental consequences of conducting different alternatives to meet the need for action while addressing the identified issues. The issues and alternatives associated with white-tailed deer damage management were initially developed by WS after consultation with the NYSDEC. The NYSDEC has regulatory authority to manage populations of white-tailed deer. To assist with the identification of additional issues and alternatives to managing damage associated with white-tailed deer in New York, this EA will be made available to the public for review and comment prior to the issuance of a Decision².

WS previously developed an EA that addressed WS' activities to manage damage associated with white-tailed deer in New York (USDA 2003). Changes in the need for action and the affected environment have prompted WS to initiate this new analysis. This EA will address more recently identified changes and will assess the potential environmental impacts of program alternatives based on a new need for action, primarily a need to address damage and threats of damage associated with white-tailed deer. In addition, this EA will: (1) assist in determining if the proposed management of damage associated with white-tailed deer would have a significant impact on the environment for both humans and other organisms, (2) analyze several alternatives to address the need for action and the identified issues, (3) coordinate efforts between WS and other entities, (4) inform the public, and (5) document the analyses of the environmental consequences of the alternatives to comply with the NEPA. Since activities conducted under the previous EA will be re-evaluated under this EA, the previous EAs that addressed white-tailed deer damage management in New York and threatened and endangered (T&E) species protection will be superseded by this analysis and the outcome of the Decision.

1.2 NEED FOR ACTION

Wildlife can have either positive or negative values depending on the perspectives and circumstances of individual people. In general, people regard wildlife as providing economic, recreational, and aesthetic benefits. For some people, knowing that wildlife exists in the natural environment provides a positive

¹ WS' Directives are found at: http://www.aphis.usda.gov/wildlife_damage/ws_directives.shtml.

²After the development of the EA by WS and consulting agencies and after public involvement in identifying new issues and alternatives, WS will issue a Decision. Based on the analyses in the EA after public involvement, a decision will be made to either publish a Notice of Intent to prepare an Environmental Impact Statement or a Finding of No Significant Impact will be noticed to the public in accordance with NEPA and the Council of Environmental Quality regulations.

benefit. However, movement and browsing activities associated with wildlife may result in economic losses to agricultural resources, natural resources, property, and threaten human safety. Therefore, an awareness of the varying perspectives and values is required to balance the needs of people and the needs of wildlife. When addressing damage or threats of damage caused by wildlife, wildlife damage management professionals must consider not only the needs of those directly affected by wildlife damage but a range of environmental, sociocultural, and economic considerations as well.

Wildlife acceptance capacity, or cultural carrying capacity, is the limit of human tolerance for wildlife or the maximum number of a given species that can coexist compatibly with local human populations. Biological carrying capacity is the land or habitat's ability to support healthy populations of wildlife without degradation to the species' health or their environment during an extended period of time (Decker and Purdy 1988). Both cultural and biological carrying capacities must be considered when resolving wildlife damage problems. Those phenomena are especially important because they define the sensitivity of a person or community to a wildlife species. For any given damage situation, there are varying thresholds of tolerance exhibited by those people directly and indirectly affected by the species and any associated damage. This damage threshold determines the wildlife acceptance capacity. While the biological carrying capacity of the habitat may support higher populations of wildlife, in many cases the wildlife acceptance capacity is lower or has been met. Once the wildlife acceptance capacity is met or exceeded, people begin to implement population or damage management to alleviate damage or address threats to human health and safety.

The alleviation of damage or other problems caused by or related to the behavior of wildlife is termed wildlife damage management and is recognized as an integral component of wildlife management (Berryman 1991, The Wildlife Society 2010). The imminent threat of damage or loss of resources is often sufficient for individual actions to be initiated and the need for damage management is derived from the specific threats to resources. Those species have no intent to do harm. They utilize habitats (*e.g.*, reproduce, walk, forage) where they can find a niche. If their activities result in lost economic value of resources or threaten human safety, people characterize this as damage. When damage exceeds or threatens to exceed an economic threshold and/or pose a threat to human safety, people may take action or seek assistance with resolving damage or reducing threats to human safety. The threshold triggering a request for assistance is often unique to the individual person requesting assistance and can be based on many factors (*e.g.*, economic, social, aesthetics). Therefore, what constitutes damage is often unique to the individual person and damage occurring to one individual may not be considered damage by another individual.

However, the use of the term “*damage*” is consistently used to describe situations where the individual person has determined the losses associated with wildlife is actual damage requiring assistance (*i.e.*, has reached an individual threshold). The term “*damage*” is most often defined as economic losses to resources or threats to human safety; however, “*damage*” would also be defined as a loss in the aesthetic value of property and other situations where the behavior of wildlife was no longer tolerable to an individual person.

When damage does occur, it can be sizable and have a substantial economic impact. In 2002, New York farmers estimated their deer-related crop damage to value approximately \$59 million, and about one quarter of farmers indicated deer damage was a significant contributing factor affecting the profits of their farm (Brown et al. 2004). Similarly, deer-vehicle collisions are a major source of deer-related damage in New York. This is a primary concern for motorists, particularly in suburban areas with abundant deer populations.

Crop damage and deer-vehicle collisions are frequently prime factors taken into consideration when a Citizen Task Force is convened to recommend a deer population level for a Wildlife Management Unit. Each year, the NYSDEC responds to countless inquiries and complaints about nuisance and damaging deer, and often these contacts can be satisfied with advice alone. However, advice alone will not work adequately to stem all damage. In cases where population reduction is the best course of action, the NYSDEC's primary method of controlling overabundant deer continues to be the harvest of antlerless deer during the fall hunting seasons. This regulated hunting season generally works best over large areas, or when damage is not severe. For more intensive, local site control during the hunting seasons, qualifying landowners can also receive Deer Management Assistance Program (DMAP) permits. DMAP addresses crop damage, forest regeneration problems, or provides custom or municipal deer management. Table 1.1 shows the breakdown of DMAP permits issued during calendar year 2012. When damage to crop lands is significant and takes place outside of normal hunting time frames, Deer Damage Permits (DDPs) can be issued to reduce crop losses that are current and ongoing. DDPs are also issued for deer control at airports and sharpshooting or capture and kill operations in parks and municipalities. Table 1.2 shows the breakdown of DDPs issued during calendar year 2012. DMAP and DDPs are designed for local effect, and impact of these permits on regional deer populations is minor compared to overall harvest of antlerless deer by hunters (NYSDEC 2011a).

Table 1.1 Deer Management Assistance Program (DMAP) Permits issued in New York by resource category during calendar years 2011, 2012, 2013 and 2014.

<u>Category²</u>	<u>2011</u>	<u>2012</u>	<u>2013</u>	<u>2014</u>
Agriculture	2,008	1,932	2,019	1,893
Forest regeneration	233	238	259	280
Custom Deer Management Programs	42	38	42	46
Significant Natural Communities	19	12	13	13
Municipal Governments	10	11	12	10

¹Taken from the New York State White-tailed Deer Harvest Summary (NYSDEC 2011b, 2012, 2013, 2014c).

²Permits may be issued for more than one category of damage; sum of permit categories may not equal the total.

Table 1.2 Deer Damage Permits issued in New York by resource category during calendar years 2011, 2012, 2013 and 2014¹.

<u>Category²</u>	<u>2011</u>	<u>2012</u>	<u>2013</u>	<u>2014</u>
Airport	40	39	41	42
Agriculture	1,871	1,777	2,054	2,114
Tree Farm/Orchard	673	472	548	506
Community/Residential	486	288	248	273
Ecological	16	23	41	51
Other	55	1	22	1

¹Taken from the New York State White-tailed Deer Harvest Summary 2012 (NYSDEC 2011b, 2012, 2013, 2014c).

²Permits may be issued for more than one category of damage; sum of permit categories may not equal the total.

1.2.1 Need for White-tailed Deer Damage Management at Airports

Airports provide ideal conditions for white-tailed deer due to the large open grassy areas adjacent to brushy, forested habitat used as noise barriers. Access to most airport properties is restricted; so white-tailed deer living within airport boundaries are not harvestable during state regulated hunting season and would be insulated from many other human disturbances. Deer are a significant safety concern to aircrafts because of their abundance, behavior, and large body size. Deer are at least five times more likely than birds to cause damage when involved in an aircraft strike (Wright et al. 1998). These animals feed, rest, and mate near runway areas and may wander onto runway surfaces or be startled or harassed into the path of incoming or departing aircraft. At night, deer may freeze when caught in the beams of light (i.e., approaching aircraft with landing lights on).

Of all wildlife species, deer are ranked as the most hazardous to aircraft, especially to smaller general aviation aircraft (Dolbeer et al. 2000), and they represent a serious threat to human health and safety. Airports are often secured areas with chain-link security fencing. Sometimes deer gain entrance into these airports where there is adequate cover and food, and they live there for all or part of the year. Because deer are ubiquitous throughout New York, it is possible for deer to be present at nearly any airport in the state.

The civil and military aviation communities have acknowledged that the threat to human health and safety from aircraft collisions with wildlife is increasing (Dolbeer 2000, MacKinnon et al. 2001, Dolbeer 2009). Collisions between aircraft and wildlife are a concern throughout the world because wildlife strikes threaten passenger safety (Thorpe 1996), result in lost revenue, and repairs to aircraft can be costly (Linnell et al. 1996, Robinson 1996, Thorpe 1996, Keirn et al. 2010). Aircraft collisions with wildlife can also erode public confidence in the air transport industry as a whole (Conover et al. 1995).

White-tailed deer are a commonly encountered problem at airfields in New York, threatening the safe operation of aircraft at those facilities. New York has a total of 111 general aviation airports and 18 commercial airports, and many other private use airports and airstrips (NYS DOT 2014). Collisions between deer and aircraft can cause major damage to the aircraft, and potentially cause injury and loss of human life. Serious consequences are also possible if pilots lose control of the aircraft while attempting to avert a collision with deer. From 1990 through 2000, there were 330 reported deer-aircraft strikes in the U. S. (USDA Wildlife-aircraft Strike Database, Sandusky, Ohio). Thirty-seven (11%) of these strikes occurred in New York. The number of deer strikes actually occurring is likely to be much greater, since Dolbeer (2009) estimated that only 39% of civil wildlife strikes are actually reported. Deer accounted for 39% of the reported strikes involving terrestrial mammals in the United States causing nearly \$31 million in damages (Dolbeer et al. 2013). Nearly 63% of the reported terrestrial mammal strikes from 1990 through 2012 occurred at night, with 64% occurring during the landing and 34% occurring during the takeoff run (Dolbeer et al. 2013). Data also indicates that a much higher percentage of mammal strikes resulted in aircraft damage compared to bird strikes (Dolbeer et al. 2013). Costs of those collisions vary, but the Federal Aviation Administration (FAA) data reveals that deer strikes in the United States cost the civil aviation industry approximately 233,265 hours of down time and 43.6 million in direct monetary losses between 1990 and 2012 (Dolbeer et al. 2013).

In addition to direct damage from these strikes, an aircraft striking a deer can pose serious threats to human safety if the damage from the strike causes a catastrophic failure of the aircraft leading to a crash. For

example, damage to the landing gear during the landing roll and/or takeoff run can cause a loss of control of the aircraft, causing additional damage to the aircraft and increasing the threat to human safety. Preventing damage and reducing threats to human safety is the goal of those cooperators requesting assistance at airports in New York given that a potential strike can lead to the loss of human life and considerable damage to property.

Wildlife populations near to or confined within perimeter fences at airports can be a threat to human safety and cause damage to property when struck by aircraft. Those wildlife confined inside an airport perimeter fence would not be considered distinct populations nor separate from those populations found outside the perimeter fence. Wildlife found within the boundaries of perimeter fences originate from populations outside the fence. Those individuals of a species inside the fence neither exhibit nor have unique characteristics from those individuals of the same species that occur outside the fence; therefore, those individuals of a species confined inside an airport perimeter fence do not warrant consideration as a unique population under this analysis.

1.2.2 Need for White-tailed Deer Damage Management to Protect Property

White-tailed deer can also damage property such as landscaping and ornamental plantings. As development expands into previously rural areas, deer habitat may actually be enhanced because fertilized lawns, gardens, and landscape plants serve as high quality sources of food (Swihart et al. 1995). Furthermore, deer are prolific and adaptable, characteristics which allow them to exploit and prosper in most suitable habitat near urban areas, including residential areas (Jones and Witham 1990).

Specific economic damage that deer cause is difficult to obtain. However, we do know that locally, deer impact landscaping and gardens, and East Hampton property damage complaints are increasing to an all-time high and now include urban areas. During 2008-2009, the Town of East Hampton's Architectural Review Board issued "a few" permits for deer fence installations. During 2010-2012, the Review Board issued a total of 40 deer fence installation permits. An East Hampton Town resident described deer fencing as her "only protection against a deer invasion" (Department of Land Acquisition et al. 2013).

In 2013, NYSDEC Bureau of Wildlife issued 43 deer damage permits to residents of the East End and Town of Brookhaven. These permits represent over 6,200 acres and an estimated \$1.34 million dollars in damage to agriculture and natural resources (NYSDEC unpublished data 2013). Other economic damage pertains to deer-vehicle collisions. As more motorists continue to strike deer, deductibles paid, reduced vehicle values, and increased premiums are some of the costs to motorists, in addition to any injuries.

1.2.3 Need for White-tailed Deer Damage Management to Protect Agricultural Resources

White-tailed deer can cause damage to a wide variety of agricultural resources, including row crops, forage crops, vegetables, fruit trees, nursery stock, ornamentals, and stored hay (Craven and Hygnstrom 1994). In addition to the immediate losses, there may be residual damage in the form of future yield reduction for fruit trees or forage crops, and ornamental trees or nursery stock may be permanently disfigured by deer browsing (Craven and Hygnstrom 1994). Although browsing is the most common type of damage, deer may also damage agricultural crops by trampling or antler rubbing (Dolbeer et al. 1994).

Since 2001, there have consistently been over 1,100 deer damage complaints in New York each year through 2012. The Deer Management Assistance program issued 1,932 permits, and 1,777 Deer Damage Permits were issued to those experiencing damage to agriculture in New York in 2012 (NYSDEC 2012).

In two recent National Agricultural Statistics Service reports for New York (2000-2001 and 2007-2008), Suffolk County had the highest cash receipts of all counties (NASS 2012). However, the local deer population impacts the agricultural production of this important county. A 2004 Cornell Human Dimensions Research Unit (HDRU) study estimated that deer damage to Long Island crops exceeded \$1.75 million (Brown et al. 2004). Suffolk County is included as one of the counties with heaviest deer damage in NYS (Brown et al. 2004). In a more recent 2009 estimation of deer damage, deer cause \$5 million per year in agricultural damage to Suffolk County farmers (Frost 2008). Deer, even young fawns, eat vegetables and fruit from emerging greenery to mature produce. Additionally, when male deer rub their antlers on young trees it may severely damage trees by removing bark and cambium and breaking small branches (Matschke et al. 1984).

Foot and Mouth Disease. Foot and Mouth Disease (FMD) is a viral disease that affects cloven-foot animals including deer. The symptoms include fever followed by blistering between toes, on the heel, within the mouth, and on mammary glands. The disease can leave animals incapable of walking or eating for up to 10 days while the blisters heal (Australian Government 2014). In 1978, an outbreak of foot and mouth disease occurred on Plum Island, an island in Suffolk County, NY, that is home to a research facility that studies animal diseases (Wade 1978a). The virus did not escape the confines of the island however, and all infected animals were killed and safely disposed of (Wade 1978b). However, deer are a known vector of this virulent disease and as such, USDA, APHIS, WS of New York is a member of the Foot and Mouth Emergency Response Task Force.

1.2.4 Need for White-tailed Deer Damage Management to Resolve Damage Occurring to Natural Resources

Natural resources may be described as those assets belonging to the public and often managed and held in trust by government agencies as representatives of the people. Such natural resources may be plants or animals, including threatened or endangered species, Species of Greatest Conservation Need, Species of Concern, or species that are locally rare, as well as unique or uncommon habitats. Examples of natural resources in New York are parks and recreation areas, natural areas, including unique habitats or topographic features, threatened and endangered plants or animals, and any plant or animal populations which have been identified by the public as a natural resource.

Deer overabundance can affect native vegetation and natural ecosystems. Numerous studies have shown that over browsing by deer can decrease plant growth, survivorship, and reproduction (Boerner and Brinkman 1996, Waller and Alverson 1997, Ruhren and Handel 2003) and can affect understory vegetation cover, plant density, or plant diversity (Warren 1991). Forest and savannah sites with overly abundant white-tailed deer populations may have lower species diversity of forbs due to preferential feeding (Urbanek et al. 2012). Preferential feeding by high numbers of white-tailed deer has also been associated with an increase exotic plant species in eastern hemlock forests (Eschtruth and Battles 2009). In forest restoration sites, one study showed that herbaceous plants were half as likely to survive in the presence of high numbers of white-tailed deer compared to areas

where deer were excluded (Ruhren and Handel 2003). Studies conducted at Rock Creek National Park in Washington D.C. recently estimated the deer density in the park to be 82 deer per square mile (NPS 2011). Their multi-year sampling was in response to a documented substantial reduction in the quality and integrity of the vegetation in the park, including shrub cover, tree seedling regeneration, and herbaceous cover. Degradation of these elements resulted in lower quality habitat for other species (NPS 2011).

The alteration and degradation of habitat from over-browsing by deer can have a detrimental effect on deer herd health and may displace other wildlife communities (e.g., neotropical migrant songbirds and small mammals) that depend upon the understory vegetative habitat destroyed by deer browsing (McShea et al. 1997, VDGIF 2007). In urban environments, the effects can be magnified due to the smaller amount of available habitat. Another negative aspect of deer over-browsing is the spread of non-native species through habitat alteration, trampling, and seed dispersal. Increases in non-native species increases competition for native plants and reduces the quality of the habitat for native wildlife (Bratton 1982). Damage to riparian areas, such as wetland and floodplains, associated with excessive deer browsing can limit the value of these areas generally attributed with high biodiversity (NPS 2011). Lands where over-browsing occurs may experience greater soil erosion and storm water runoff, negatively affecting wetlands and waterways (NPS 2011). For example, deer browsing may affect vegetation that songbirds need for foraging surfaces, escape cover, and nesting (DeCalesta 1997). DeCalesta (1994) found that the species richness and abundance of intermediate canopy nesting songbirds was reduced in areas with higher deer densities. Casey and Hein (1983) found that three species of birds were lost in a research preserve stocked with high densities of ungulates and that the densities of several other species of birds were lower than in an adjacent area with lower deer density. Waller and Alverson (1997) hypothesize that by competing with squirrels and other fruit-eating animals for oak mast, deer may further affect many other species of animals and insects. Wheatall et al. (2013) speculates that as high deer densities shift diverse hardwood forests toward black cherry stands, 66% of caterpillar species may lose suitable host plants and therefore be eliminated, which would affect the entire food chain and pollination of certain plant species.

White-tailed deer are documented to negatively impact recruitment of local tree populations in East End forests. U.S. Forest Service Biologist, T. Rawinski, reports that local deer have reduced American beech sprouts to knee-high heights (Rawinski 2013). It is a simple matter of too many deer devouring tree seedlings and saplings. Mature trees blown over during storms and dying through natural causes are not being replaced (Rawinski 2013). The Deer Management Assistance Program in New York State issued 238 permits to those experiencing damage to forest regeneration and 12 permits to those experiencing damage to significant natural communities within the state (NYSDEC 2012).

The same report documents deer negatively impacting understory plants in East End forests. Pink lady's slipper, Canada mayflower, and false Solomon's seal have been reduced to isolated individuals. Wild sarsaparilla is no longer present, and sweet pepperbush stems are also reduced to knee-high levels. Lowbush blueberry has become too stunted to yield fruit. Adding insult to injury, invasive species such as wineberry, mile-a-minute vine, and Japanese barberry are exploiting vacant native plant niches (Rawinski 2013). This destruction of plant life has a direct impact to local animals. The suppression of flowering plants such as pink lady's slipper no longer provide native insects with pollen or nectar (Rawinski 2013), and native fruits like lowbush blueberry are no longer available to songbirds and small mammals (Rawinski 2013). Further, the elimination of ground plants is thought to contribute to erosion and sediment runoff into local marine estuaries.

Chronic Wasting Disease. Chronic wasting disease (CWD) is a transmissible spongiform encephalopathy (TSE) of deer and elk. To date, this disease has been found only in cervids (members of the deer family) in North America. CWD is typified by chronic weight loss leading to death. In 2005, the first cases of CWD occurred in New York in two captive breeding facilities (NYCDEC 2014*b*). As of 2005, approximately 564 entities in New York were raising over 11,000 deer and elk in captivity (Shepstone 2008).

A statewide surveillance program began in 2002 following the detection of CWD in the western US. In April of 2005, CWD was confirmed in five white-tailed deer in Oneida County. Containment areas were established and deer checks were created to inspect harvested deer. The NYSDEC established an intensive monitoring program, and two additional white-tailed deer within the containment area were confirmed to have CWD later in April 2005. There have been no reported cases of CWD since that time, and in 2010 the containment area was lifted (NYSDEC 2014*b*). Currently there is no evidence indicating that humans are at risk of acquiring CWD. However, it is recommended that people not consume affected animals and that hunters take precautions when handling suspect deer (NYS Dept of Health 2012).

This discussion on zoonoses is intended to briefly address the more common known zoonoses found in white-tailed deer in the United States but is not intended to be an exhaustive discussion of all potential zoonoses. The transmission of diseases from wildlife to humans is neither well documented nor well understood for most infectious zoonoses. Determining a vector for a human infected with a disease known to occur in wildlife populations is often complicated by the presence of the known agent across a broad range of naturally occurring sources. For example, a person with salmonella poisoning may have contracted salmonella bacterium from direct contact with an infected pet but may have also contracted the bacterium from eating undercooked meat or from other sources.

Disease transmission directly from wildlife to humans is uncommon. However, the infrequency of such transmission does not diminish the concerns of those individuals requesting assistance that are fearful of exposure to a diseased animal since disease transmissions have been documented to occur. Wildlife Services actively attempts to educate the public about the risks associated with disease transmission from wildlife to humans through technical assistance and by providing technical leaflets on the risks of exposure.

In addition to disease transmission threats, requests are also received for assistance from individuals who perceive threats of physical harm from white-tailed deer. Human encroachment into wildlife habitat increases the likelihood of human-deer interactions. Additionally, many people enjoy wildlife to the point of purchasing food specifically for feeding wildlife despite laws prohibiting the act in many areas. Human actions can increase the survival rates and carrying capacity of adaptable wildlife species. Often the only limiting factor of wildlife species in and around areas inhabited by people is the prevalence of diseases. This can be confounded by the overabundance of wildlife congregated into a small area that can be created by the unlimited amount of food, water, and shelter found within those habitats.

As people are increasingly living in closer proximity to wildlife, the lack of harassing and threatening behavior by people toward many species of wildlife has led to a decline in the fear wildlife have toward people. When wildlife species begin to habituate to the presence of humans and human activity, a loss of apprehension occurs that can lead to threatening behavior toward humans. This threatening behavior continues

to increase as human populations expand and the populations of those species that adapt to human activity increase.

Threatening behavior can be in the form of aggressive posturing, a general lack of apprehension toward people, or abnormal behavior. Often, wildlife exhibiting threatening behavior or a loss of apprehensiveness to the presence of humans is a direct result and indication of an animal inflicted with a disease. So, requests for assistance are caused by both a desire to reduce the threat of disease transmission and from fear of aggressive behavior either from an animal that is less apprehensive of people or induced as a symptom of disease.

1.2.5 Need for White-tailed Deer Damage Management to Protect Human Health

Zoonoses (*i.e.*, wildlife diseases transmissible to people) are a major concern of cooperators when requesting assistance with managing threats from white-tailed deer. Disease transmission would occur from interactions between humans and white-tailed deer, humans and parasites that had been living on white-tailed deer, or from interactions with pets and livestock that had been in direct contact with wild white-tailed deer. Pets and livestock often encounter and interact with wild white-tailed deer, which can increase the opportunity of transmission of disease to humans.

Individuals or property owners that request assistance with white-tailed deer frequently are concerned about potential disease risks but are unaware of the types of diseases that can be transmitted by those animals. In those types of situations, assistance is requested because of a perceived risk to human health or safety associated with wild animals living in close association with humans.

In many circumstances when human health concerns are the primary reason for requesting WS' assistance there may have been no actual cases of transmission of disease to humans by white-tailed deer. Thus, the risk of disease transmission would be the primary reason for requesting assistance from WS. The threat of disease associated with white-tailed deer populations may include, but are not limited to:

Tick borne Diseases. Ticks are common vectors for diseases that can be associated with vertebrates such as white-tailed deer. Table 1.3 shows common tick borne illnesses in the northeast that would affect humans:

Table 1.3 Tick borne diseases in the Eastern United States that pose potential health risks through transmission to humans[†] (CDC 2010).

<u>Disease</u>	<u>Host</u>	<u>Vector</u>	<u>Human Exposure</u>
Lyme Disease	Mammals, birds, reptiles, and amphibians	Deer tick (<i>Ixodes scapularis</i>)	Tick bite
Ehrlichiosis	Mammals, birds, reptiles, and amphibians	Lone star tick (<i>Amblyomma americanum</i>)	Tick bite
Powassan	Mammals, birds, reptiles, and amphibians	Deer tick (<i>Ixodes scapularis</i>), woodchuck tick (<i>Ixodes cookei</i>), squirrel tick (<i>Ixodes marxii</i>)	Tick bite
Rocky Mountain Spotted Fever	Mammals, birds, reptiles, and amphibians	American dog tick (<i>Dermacentor andersoni</i>), Rocky Mountain wood tick (<i>Dermacentor andersoni</i>), brown dog tick (<i>Rhipicephalus sanguineus</i>)	Tick bite
Babesiosis	Mammals, birds, reptiles, and amphibians	Deer tick (<i>Ixodes scapularis</i>)	Tick bite

[†]Table 1.3 is not considered an exhaustive list of tick borne diseases that can be transmitted to humans that are carried by wildlife species. The zoonoses provided are the more common tick borne diseases.

i. Lyme Disease: Currently, the most common zoonosis involving deer is Lyme disease, caused by the bacterium *Borrelia burgdorferi* and vectored to humans by the deer tick (*Ixodes scapularis*) in the eastern U.S. (Conover 1997). Deer ticks are also called blacklegged ticks. For the remainder of this document, these ticks will be referred to as deer ticks. Initial symptoms of Lyme disease include a flu-like illness often accompanied by a characteristic bulls-eye rash, headache, fever, muscle or joint pain, neck stiffness, swollen glands, jaw discomfort, and inflammation of the eye membranes. If left untreated, heart, nervous system, and joint manifestations may develop (McLean 1994).

Limited information is known about the relationship between white-tailed deer and the spread of Lyme disease-carrying deer ticks. Small mammals and birds are reservoirs of the bacterium that causes Lyme disease, and immature deer ticks primarily feed on these animals in the spring. In the fall, adult deer ticks preferentially feed on white-tailed deer (Hayes and Piesman 2003), and this provides a final blood meal that is necessary for adult deer ticks to mate and reproduce (American Lyme Disease Foundation 2010). The transmission of the *B. burgdorferi* bacterium to humans occurs when an infected tick attaches to a person and feeds, usually for a minimum of 36 hours (Hayes and Piesman 2003). Although deer are implicated in the spread of deer ticks which vector Lyme disease, researchers have found varying conclusions on the relationship between deer densities and deer tick densities. Reducing deer densities in isolated environments such as islands and peninsulas has been shown to have a positive effect on reducing the disbursement and abundance of deer tick nymphs (Deblinger et al. 1993, Kilpatrick et al. 2014). Additionally, reduced deer densities in these isolated environments has been shown to correspond with a reduction in tick infection rates, and a reduction in the reported cases of human Lyme disease (Kilpatrick et al. 2014). However, this same

relationship is uncertain in more open landscapes, and the level of deer reduction that would be necessary is unknown.

Table 1.4 Summary of the 20 New York state counties that reported the highest number of Lyme disease cases in 2012 (NYS Department of Health, Unpublished Data).

COUNTY	Cases	Incidence	Cases	Incidence	Cases	Incidence	Cases	Incidence	Cases	Incidence
2008*	2008*	2009*	2009*	2010*	2010*	2011*	2011*	2012*	2012*	
Suffolk	542	37.3	498	32.9	609	40.1	656	43.9	689	46.1
Orange	991	262.7	1088	286.6	645	168.2	953	255.6	545	146.2
Rensselaer	542	349	440	283.4	323	207.7	656	411.5	506	317.4
Dutchess	1,141	389.8	979	334.3	519	176.8	440	147.9	435	146.2
Ulster	778	427.8	582	320.4	361	199	412	225.8	370	202.7
Columbia	584	936.5	572	922.5	384	623.2	355	562.6	343	543.6
Saratoga	364	168.6	407	187.4	293	133.1	525	239.1	340	154.8
Putnam	202	203	381	383.9	171	172.3	345	346	242	242.7
Rockland	353	119.1	328	109.9	243	81	279	89.5	241	77.3
Albany	638	213.2	638	214	466	156.2	364	119.7	220	72.3
Westchester	264	27.8	659	69.1	404	42.3	635	66.9	211	22.2
Green	313	635.6	402	820.5	253	516.9	310	629.8	203	412.4
Washington	183	291.7	196	312.1	135	215.1	272	430.3	119	188.2
Tompkins	42	41.6	49	48.4	70	68.8	145	142.8	87	85.7
Sullivan	118	154.6	114	149.6	147	193.9	121	156	85	109.6
Broome	19	9.7	24	12.3	22	11.3	62	30.9	64	31.9
Nassau	40	3.1	218	16.1	67	4.9	98	7.3	56	4.2
St. Laurence	25	22.8	47	42.8	33	30.1	40	35.7	50	44.7
Onondaga	67	14.8	37	8.2	82	18	86	18.4	49	10.5
Jefferson	37	31.6	49	41.5	30	25.3	44	37.9	43	37

* Many counties are participating in a project where they investigate a sample of positive laboratory results. The number of actual cases is then extrapolated to generate estimates of the total number of cases.

As of 2008 the national Lyme disease surveillance case definition was revised to include definitions of confirmed, probable and suspect cases. Under this new definition, the CDC will publish confirmed and probable cases. This change takes place from 2008 forward.

Incidence is Cases/100,000 population.

New York ranks among the top 10 states with the highest Lyme diseases incidence rates (American Lyme Disease Foundation 2011). Since 1986, when Lyme disease first became reportable, over 95,000 cases have been confirmed within the state (NYS Department of Health 2012). From 2002-2012, an average of 51 cases/100,000 human population with Lyme disease were reported in 56 New York counties (NYS Department of Health, Unpublished Data). Table 1.4 is a summary of the counties in New York that reported the highest number of cases of Lyme disease in 2012, with information from 2008-2012. The number of Lyme disease reports from Suffolk County has fluctuated from 190 cases in 2006 to 689 cases in 2012 with a slightly increasing trend over the last 10 years (NYS Department of Health, Unpublished Data). Anecdotally, a local East Hampton medical doctor saw the number of his patients with Lyme disease more than double from 60 in

2010 to 125 in 2011 (Department of Land Acquisition et al. 2013). Local biologists surmise that the preponderance of deer on Long Island provides an unusually large food source for the nymphs.

ii. Ehrlichiosis: In 1986, another serious tick-borne zoonosis, human ehrlichiosis, was discovered in the United States (McQuiston et al. 1999). Two distinct forms of the illness may affect humans: human monocytic ehrlichiosis (HME) and human granulocytic ehrlichiosis (HGE) (McQuiston et al. 1999, Lockhart et al. 1997). The bacterial agents that cause ehrlichiosis are transmitted to humans by infected ticks that acquire the agents from feeding on infected animal reservoirs (McQuiston et al. 1999). Ehrlichiosis in humans may result in fever, headache, myalgia, nausea, and occasionally death (McQuiston et al. 1999, Little et al. 1998). HME is the type of ehrlichiosis predominantly found in the southeastern, south-central, and mid-Atlantic U.S. White-tailed deer are major hosts for *Amblyomma americanum*, the tick that transmits HME, and deer have been identified as a reservoir for HME (Little et al. 1998, Lockhart et al. 1997). Suffolk County has 44% of the state's cases of Ehrlichiosis (Parpan 2013). Deer contribute to the spread of lone star ticks and deer ticks vectoring Ehrlichiosis on Long Island. Each year there are 1 to 3.3 cases per million of New Yorkers with Ehrlichiosis reported to the CDC (2012). The number of Ehrlichiosis cases has increased since the disease became reportable, from 200 cases in 2000 to 961 cases in 2008 (CDC 2012).

iii. Powassan: The Powassan virus (POWV) and its variant Deer Tick Virus (DTV) fall within the tick borne encephalitis group of flaviviruses (Grard et al. 2007). POWV was identified in 1958 in Powassan, Canada. Symptoms may include headaches, fever, vomiting, confusion, weakness, seizures, and memory loss, and long-term neurologic complications may occur. There is no specific treatment, but people with severe POWV may need hospital care to reduce swelling of the brain and provide respiratory support (CDC 2010) and doctors have speculated that POWV leads to death in 10 – 30% of cases (Nielsen 2013).

Between 2001 and 2012, 13 cases of the Powassan encephalitis were reported in the state of New York (CDC 2010). A majority of these cases were found in the Lower Hudson Valley where Lyme disease is endemic (Khoury et al 2013). In 2013, a teenager in Poughkeepsie, New York died from Powassan encephalitis (Bird 2013). As deer ticks account for a majority of the tick bites in this area, it is suspected that the variant DTV is most often being transmitted through deer tick bites (Khoury et al. 2013).

iv. Rocky Mountain Spotted Fever: Caused by the bacterium *Rickettsia rickettsia*, Rocky Mountain Spotted Fever (RMSF) is a potentially life threatening illness with symptoms that include vomiting, headache, fever, and muscle and abdominal pain. In 2010 there were between 1.5 and 19 cases per million in the state of New York (CDC 2010).

v. Babesiosis: Caused by microscopic parasites that affect red blood cells, Babesiosis is spread by *Ixodes scapularis*, commonly called deer ticks. Symptoms vary and might include fever, headache, body ache, chills, fatigue, and nausea (CDC 2010). Babesiosis has been present in the lower Hudson Valley of New York since 2001 (Joseph et al. 2011). Since that time, the number of cases have increased 1.6 fold across the state of New York from 89 cases in 2001 to 142 cases in 2008, and the number of cases within the Lower Hudson Valley have risen 20 fold from 6 per year to 119 per year from 2001 -2008 (Joseph et al. 2011). Suffolk County has 49% of the state's cases of Babesiosis (Parpan 2013). Deer are also implicated in the distribution of deer ticks vectoring Babesiosis on Long Island. In 2011, there were 1,092 reported cases in 18 states in the U.S. Thirty-two percent

(361) were in New York and 5% were in NYC (Herwaldt et. al 2012). Most NY cases of Babesiosis are from Long Island (NYS Dept of Health 2012).

Bovine Tuberculosis. Tuberculosis (TB) is a contagious disease of both animals and humans and can be caused by three specific types of the Mycobacterium bacteria. Bovine TB, caused by *Mycobacterium bovis*, primarily affects cattle and other bovine-like animals (e.g., bison, deer, and goats) but can be transmitted to humans and other animals.

Pathogenesis of *M. bovis* infection in white-tailed deer begins with either inhalation or ingestion of infectious organisms. Transmission is aided by high deer density and prolonged contact, as occurs at supplemental feeding sites. The bacilli commonly invade the tonsil first, later spreading to other cranial lymph nodes. If the infection is contained, it spreads no further. In some animals the infection spreads to the thorax where it may disseminate throughout the lungs; these animals may then shed the bacteria by aerosol or oral secretions. The most susceptible animals develop disseminated infections throughout their abdominal organs, and can even shed bacilli through their feces or through their milk to their fawns.

Bovine TB has affected both animal and human health for years. During the early part of the 20th century the disease affected more U.S. farm animals than did all other infectious diseases combined. The USDA Cooperative State-Federal Tuberculosis Eradication Program, which began in 1917, is chiefly responsible for the near eradication of the disease from the nation's livestock population.

In 2008, TB was detected in a captive deer in Columbia County, New York by NYS Department of Agriculture and Markets (NYS DAM). This finding led to the sampling of road killed and hunter harvested deer to rule out infection of wild deer populations. Sampling of hunter harvest and road killed deer was conducted by NYS DEC, NYS DAM, and WS. No wild deer were diagnosed with TB following this incident (Justin Gansowski, USDA Wildlife Services, personal communication).

Other Human Health and Safety Concerns

White-tailed deer cause damage to a variety of property types in New York each year. Deer-vehicle collisions are a serious concern nationwide because of losses to property and the potential for human injury and death (Conover et al. 1995, Romin and Bissonette 1996, Conover 1997). The economic costs associated with deer-vehicle collisions include vehicle repairs, human injuries and fatalities, and picking up and disposing of deer (Drake et al. 2005). The Insurance Institute for Highway Safety (2005) estimated that 1.5 million deer-vehicle collisions occur annually in the United States causing approximately 150 fatalities and \$1.1 billion in damage to property. In 1995, the damage to vehicles associated with striking deer was estimated at \$1,500 per strike in damages (Conover et al. 1995). Damage costs associated with deer collisions in 2011 were estimated at \$3,171 per incident, which was an increase of 2.2% over the 2010 estimate (State Farm Mutual Automobile Insurance 2011).

According to State Farm Insurance, New York is a “High Risk” state for deer-vehicle collisions, and New Yorkers have a 1 in 160 chance of their cars colliding with a deer during the next year—based on 2011-2012 data (State Farm 2013). In New York State, there were about 35,000 reported deer crashes in 2011 with four people killed and 1,311 injured (Meece 2013). In the Town of East Hampton, reported deer vehicle collisions have

increased from 25 in 2000 to 108 in 2011, an increase of over 400%. Furthermore, it is believed the extensive use of fencing in Suffolk County to exclude deer to reduce crop and ornamental plant damage has resulted in deer traveling on roads and likely contributing to deer vehicle collision due to inability to get off the road (Civiletti 2011, Verret 2006).

Additionally, there are other health and cleanliness concerns. The local overpopulation of deer produces unusually high loads of pellet droppings in residential properties, including children's play areas. These deer droppings cause parents to be concerned about the safety of allowing their children to play in these areas. Three residents of Southold reported that the deer fecal loads on their properties rendered their yards unsanitary for their children or grandchildren to play (Southold Public Deer Management Forum, September 26, 2013).

1.2.6 Need for Disease Surveillance and Monitoring

Public awareness and health risks associated with zoonoses (*i.e.*, diseases of animals that can be transmitted to humans) have increased in recent years. Several zoonotic diseases associated with white-tailed deer are addressed in this EA. Most disease sampling would occur ancillary to other wildlife damage management activities (*i.e.*, disease sampling occurs after wildlife have been captured or harvested for other purposes). For example, WS may sample deer harvested in cooperation with state wildlife and/or agriculture agencies during the annual hunting season or other damage management programs to monitor for disease (*i.e.*, Chronic Wasting Disease, tuberculosis).

1.2.7 Examples of Projects Relating to Damage Management or to Disease Surveillance and Monitoring in New York

Deer Damage Management at Stewart International Airport

According to the Federal Aviation Administration Wildlife Strike Database, two aircraft have struck white-tailed deer at Stewart International Airport. The first of the two strikes occurred on December 12, 1991 to a Shorts 360 aircraft, operated by Nashville Eagle Airline. No damage was documented as a result of the strike. The second strike occurred September 21, 2000, to a CL-RJ 100/200, operated by Comair Airlines. The strike caused minor damage to the aircraft.

Stewart International Airport implemented efforts to reduce deer threats to aviation safety with limited culling from dawn to dusk, identification of gaps beneath the perimeter fence, repair of those gaps, and closing and locking gates so the space between the two sections of gate (when closed) prevent deer access to the airfield. Shooting with shotguns from dawn to dusk is the best opportunity for airport operations staff to successfully remove deer observed on the Aircraft Operations Area. Operations staff had limited equipment to conduct culling efforts during night-time hours. Regardless, operations staff removed 16 deer from the airfield from 2007 to 2013, resulting in the average harvest of two deer per year.

Prior to WS conducting a Wildlife Hazard Assessment in 2009, Operations staff infrequently inspected the perimeter fence for gaps and spaces between swinging gates that would allow deer to access the airfield. Wildlife Services documented fence issues from 2007 to 2009 and provided technical assistance to Stewart International Airport regarding the importance and necessity for repairs and proper maintenance. Stewart International Airport

implemented corrective actions in 2010. These actions included using soil to fill gaps under the fence, cutting and attaching new sections of fence to repair gaps, attaching a 4-foot piece of fence “skirting” to the bottom outside section of the perimeter fence, and adjusting gates to close within approximately three inches to reduce the size of the gap between each swinging panel.

Through the implementation of exclusion, hazing and lethal (firearms) deer management strategies at Stewart International Airport and Stewart Air National Guard, which is located on Stewart International Airport, the threat deer pose to aviation has been reduced. These activities include fence inspections and repairs on both Stewart International Airport and Stewart Air National Guard, year-round monitoring through the use of trail cameras, performing day-time and night-time wildlife patrols using spotlights, night vision, thermal imaging cameras, and physical inspection of tracks and scat, and conducting direct assistance through the use of non-lethal and lethal management to remove deer that pose an immediate threat. No deer have been struck at Stewart International Airport since 2000.

Since 2005, WS chased one deer off the airfield through an open gate and removed 40 deer from Stewart International Airport and Stewart Air National Guard. However, deer were continuously observed in small groups outside the perimeter fence. WS recommended that Stewart International Airport implement an archery hunting program on its land outside the perimeter fence to reduce risk of deer entering the Aircraft Operations Area. The goal of the archery program would be a reduction in the deer population outside the perimeter fence, lowering the potential for deer to access the airfield.

Twelve hunters were selected to participate in the archery program, of which four hunters were assigned to one of three zones. As a program requirement, each hunter had to harvest at least one doe before taking an antlered deer. The twelve hunters were able to successfully remove 27 deer on airport property during the first hunting season in 2013.

Long Island Deer Damage Management Demonstration Project

The Long Island Deer Damage Management Demonstration Project occurred in Suffolk County, Long Island, NY. This area of New York is described as agriculture with small villages interspersed among six towns. The towns have many small farms and small woodlots. The east end of Suffolk County has a long standing deer damage conflict like many areas of New York where suburbia and small lot size limit hunter access, and thus deer hunting alone is no longer an effective tool to manage the deer population.

“The DEC roughly estimates the current deer population in Suffolk County to be between 25,000 and 35,000 deer” (J. Stiller, Deer Biologist, NYSDEC Bureau of Wildlife, personal communication). Deer herds will increase 30 to 40% per year in good habitat conditions (West Virginia DNR 1999), so annual harvest would need to be in this range in order to stabilize the herd. In 2012, hunters and landowners who were using deer damage permits harvested 3,581 deer in Suffolk County (NYSDEC, Unpublished Data). An additional unknown number of deer were killed by vehicles. The state wildlife agency has offered to issue permits to property owners experiencing property damage so that they can kill deer from February to September, but few have utilized the permits. In New York, most hunters are satisfied taking one deer per year (NYSDEC, Unpublished Data). Local and state governments have opened county and state parks to deer hunting in recent years to eliminate refuges and deer damage impacts on neighbors.

At the time of European settlement the continent held an estimated deer population of 8-20 deer per square mile, which is what can still be found in areas of the minimal development in the Northeast (USFW 2012). The high density of deer today contributes to severe damage among many resources. Verret (2006) reported an average of 51 deer per square mile in one east end jurisdiction. Suffolk County is included as one of the counties with heaviest deer damage in NYS (Brown et al. 2004). In a more recent 2009 estimation of deer damage, deer cause \$5 million per year in agricultural damage to Suffolk County farmers (Frost 2008). Deer, even young fawns, eat vegetables and fruit from emerging greenery to mature produce. Also male deer damage nursery stock by eating and by rubbing their antlers on young trees. Rubbing of antlers removes the bark and phloem cells that transport dissolved food material to the tree and may result in death of young trees.

According to State Farm, New York is a “High Risk” state for deer-vehicle collisions, and New Yorkers have a one in 160 chance of their cars colliding with a deer during the next year—based on 2011-2012 data (State Farm 2013). In New York State, there were about 35,000 reported deer crashes in 2011 with four people killed and 1,311 injured (Meece 2013). In the Town of East Hampton, reported DVCs have increased from 25 in 2000 to 108 in 2011, an increase of over 400%. Furthermore, it is believed the extensive use of fencing in Suffolk County to exclude deer to reduce crop and ornamental plant damage has resulted in deer traveling on roads and likely contributing to deer vehicle collision due to inability to get off the road (Civiletti 2011, Verret 2006).

There are several types of threats to human health and safety caused by or involving deer in Suffolk County. Some threats to human health are related to concern about fecal contamination and other concerns are about disease transmission. The local overpopulation of deer produces unusually high loads of pellet droppings in residential properties, including children’s play areas. These deer droppings cause parents to be concerned about the safety of allowing their children to play in these areas. Three residents of Southold reported that the deer fecal loads on their properties rendered their yards unsanitary for their children or grandchildren to play (Southold Public Deer Management Forum, September 26, 2013).

Limited information is known about the relationship between white-tailed deer and the spread of Lyme disease-carrying deer ticks. Small mammals and birds are reservoirs for Lyme, and deer ticks feed on these animals. Deer are vectors and blood meals for the deer tick nymphs, which are most active in spring/early summer, and deer are immune from Lyme disease. Local biologists surmise that the preponderance of deer provides an unusually large food source for the nymphs. Anecdotally, a local East Hampton medical doctor saw the number of his patients with Lyme disease more than double from 60 in 2010 to 125 in 2011 (Department of Land Acquisition et al. 2013). The number of Lyme disease reports from Suffolk County has fluctuated from 190 cases in 2006 to 689 cases in 2012 with a slightly increasing trend over the last 10 years (NYS Dept of Health 2013).

Suffolk County has 49% of the state’s cases of Babesiosis (Parpan 2013). Deer are also implicated in the distribution of deer ticks vectoring Babesiosis on Long Island. In 2011, there were 1,092 reported cases in 18 states in the U.S. Thirty-two percent (361) were in New York and 5% were in NYC (Herwaldt et al. 2012). The number of reported cases of Babesiosis has been rising steadily since the disease was first seen in 2001, according to NYSDOH (NYMC 2013). Most NY cases of Babesiosis are from Long Island (NYS Dept of Health 2012).

Suffolk County has 44% of the state’s cases of Ehrlichiosis (Parpan 2013). Deer contribute to the spread of lone star ticks and deer ticks vectoring Ehrlichiosis on Long Island. Each year there are 1 to 3.3 cases per million New

Yorkers of Ehrlichiosis reported to the CDC (CDC 2012). The number of Ehrlichiosis cases has increased since the disease became reportable, from 200 cases in 2000 to 961 cases in 2008 (CDC 2012).

The East End of Suffolk County is typical of most locations in New York in that deer hunting over a 3-month archery season and one month gun season are the primary tools to manage local deer populations. Town residents report nearly all land that legally may be hunted is being hunted for deer. Hunters must comply with state law which limits discharge of archery and firearms to more than 500 feet from dwellings. In the fall 2014 archery hunting season, the discharge of arrows will be reduced to 150 feet from a dwelling due to a change in state law. The East End is exceptional in that the Long Island Farm Bureau has assisted local farmers in acquiring grants to cost-share in the building of deer resistant fencing to exclude deer from crops. Also, homeowners have extensively erected fencing around individual shrubs and ornamental trees as well as their entire yard to limit deer access and damage. Some landowners plant less palatable flowers and shrubs to limit deer browsing. Other homeowners reported giving up on planting flowers or ornamental shrubs due to excessive browsing. Some communities and landowners have used culling programs to reduce local deer abundance.

WS staff met with the Long Island Farm Bureau, attended public meetings held by the towns and villages, and discussed deer management options with NYSDEC Long Island and Albany office staff, NYS Office of Parks, Recreation, and Historic Resources, and U.S. Fish and Wildlife Service. The scale of the damage and area affected (about half a county), plus the deer management methods currently being implemented required a strategy to complement the current deer management program. Two strategies were evaluated.

After meeting with local government agencies, state and federal agencies and Long Island Farm Bureau in 2013 and 2014, it was apparent that funding for deer damage management was limited. Wildlife damage can be managed by managing the habitat, changing peoples' behavior, or managing the wildlife population. Changing the habitat or people's behavior would not reduce the damage satisfactorily or in a timely manner. A population management program was needed to reduce the local deer population to reduce damage in a sufficient time frame. A culling program that focused on removing adult doe deer would help by reducing the local deer population growth rate.

The second strategy evaluated was using a registered contraceptive, GonaCon™. GonaCon™ is the only contraceptive registered with the Environmental Protection Agency to reduce deer population growth. GonaCon™ is registered and designed to be used on a closed population (e.g., fenced or a small island); the deer must be captured by dart gun or drop net and ear tagged then hand injected with GonaCon™; and the local deer population must then be reduced to the desired population level by culling and/or hunting. An estimated 90% of the female deer population must be captured and hand injected every other year at a cost of \$2,000 to \$3,000 per doe. Since there is an estimated 30,000 deer in Suffolk County and if we assume the population is 66% female, then 5,417 does must be treated with GonaCon™ and 20,976 culled in the initial year. Table 1.5 shows the cost of a GonaCon™ project would be estimated at \$45 to \$68 million over the 10 year life of the project (Table 1.5). There would be additional costs beyond year 10. Cost would re-occur every year forever to hold the local deer population at lower levels. A project of this scale is believed to be cost-prohibitive and contrary to the design of GonaCon™. The logistics of obtaining permission from landowners to implement such a project at this scale is untested.

Table 1.5 Costs Associated with Using GonaCon™.

<u>Cost to shoot deer from 33 to 10 deer/sq. mile*</u>	<u>low end</u>	<u>high end</u>
33 deer - 23 deer = 10 deer per square mile		
23 deer x 912 square miles = 20,976 deer to kill		
cost to kill 20,976 deer =	\$4,195,200	\$6,292,800
<u>Cost to treat 10 deer per square mile (66% female)</u>		
6.6 deer x .9 = treated population per sq. mile	5.94	
5.94 deer x 912 square miles	5417	
5417 deer to treat x \$2,000 to \$3,000 each doe	\$10,834,000	\$ 16,251,000
<u>Cost of GonaCon™ Project</u>		
	<u>low end</u>	<u>high end</u>
Cost of GonaCon™ Project Year 1	\$10,839,423	\$16,251,000
Cost of GonaCon™ Project Year 2-10	\$45,188,920	\$67,608,380

*The GonaCon™ label suggests using GonaCon™ with other deer population management strategies.

The most effective and long term approach to white-tailed deer damage management caused by an overpopulation of deer is by managing the herd on a regional level with an integrated management approach, through a variety of applicable methods over a period of several years. The Long Island Deer Damage Management Demonstration Project was implemented in February and March 2014. Wildlife Services had permission from 16 landowners to perform deer management on over two dozen properties. While monitoring these locations in eastern Suffolk County for deer sign or activity, WS removed deer on 12 properties—the remaining properties either showed no sign of deer activity or did not provide safe shooting zones. During 2014, WS culled a total of 192 deer from stationary locations and by mobile teams to complement deer harvest by legal hunting.

Letchworth State Park Deer Damage Management Project

The entirety of the 14,000 acre Letchworth State Park was opened to deer hunting in 1963. However, in the late 1970's, no hunting zones encompassing approximately 1,200 acres were established in the southern portion of the park around the more heavily used patron and employee areas. Over time, the deer population within the southern no-hunting zone had substantially increased (Janis 2009). In 2003, the NYSDEC estimated the number of deer in the no hunting zone at 60 to 90 per square mile. According to NYSDEC, the preferred density of deer that allows for a more balanced ecosystem and forest regeneration is 19 deer per square mile (Snider 2003). The desired deer density for a sustainable forest community may be even lower as maintaining biodiversity requires a lower relative deer density compared to that for tree regeneration (DeCalesta and Stout 1997).

With population densities at 60 to 90 deer per square mile, deer were impacting the park manager's goals of maintaining biodiversity within Letchworth State Park. Reducing deer densities to a more appropriate level within the safety zone would allow restoration of a multi-layered understory consisting of trees saplings, shrubs, and herbaceous plants and to reduce the invasion of nonnative plants into significant forest communities within the park. Through improved and more active management, the ecological diversity of plants and animals would be restored (Janis 2009).

Deer impacts in the southern no-hunting zone of the park included lack of forest regeneration, disappearance of wildflowers and ferns. From 1963 to 2009, the diversity of native plants in the southern no-hunting zone has substantially diminished. There has almost been a complete loss of leatherwood (*Dirca palustris*), Canada yew (*Taxus canadensis*), and hobblebush (*Viburnum lantanoides*). Many members of the lily family, including *Trillium*, most of the 15 species of orchids in the park, and more than 30 species of fern have been heavily browsed, if not eliminated, in the no hunting zone. An entire 200 yard patch of bloodroot (*Sanguinaria canadensis*) has disappeared in the Upper Falls area (D. Bassett, Letchworth State Park, personal communication). While native plants have been decreasing, there has been an increase in some non-native, invasive species within these areas. Garlic mustard (*Alliaria petiolata*), an invasive plant species, first appeared in Letchworth in 1980, only a few years after the closure of hunting in the southern area of the park. Japanese barberry (*Berberis thunbergii*), another invasive plant species, is now also found in the southern no-hunting zone (Janis 2009).

The number of deer in the park also poses a risk to the health and safety of park patrons and employees. Deer-auto collisions in and surrounding the parks were numerous. From 2004 through 2009, there were 118 deer related collisions in the area with 61 alone in the small town of Genesee Falls (Snider 2003). There have been 30 deer auto collisions within the park proper (Janis 2009).

In 2009, New York State Office of Parks, Recreation and Historic Preservation (NYS OPRHP) opened a portion of the southern no-hunting zone within the park to a late season archery hunt in an effort to remove 100 adult does from the white-tailed deer population within the 1,200+ acre safety zone of Letchworth State Park. The archery hunt removed a total of 40 deer between November 30 and December 22, 60 deer short of the harvest goal. Wildlife Services was contacted by NYS OPRHP and requested to assist in removing an additional 60 deer to meet the harvest objective.

WS removed white-tailed deer from the safety zone of Letchworth State Park utilizing a marksman from a vehicle after a permit was issued by NYSDEC. Operations commenced at dusk and continued through the night using forward looking infra-red cameras (FLIR), spot-lights and suppressed rifles. During one night, 52 antlerless deer were removed. The sex and age of the 52 deer removed were comprised of 47 adult does, two female fawns, two male fawns and one adult buck. The goal of the culling program to complement hunting to harvest the necessary number of deer was met. All meat from the culled deer was processed and donated to local charities. Recreational archery hunting has been the sole method of population control at Letchworth State Park within the safety zone since the initial WS population reduction in 2010.

Teatown Lake Reservation Project

Teatown Lake Reservation, an 875-acre private nature preserve in Westchester County, New York, established a goal of restoring their forest to a healthy state. Based on pellet count surveys in 2009, 2011, 2012 and 2013, the deer population at Teatown was estimated to be 72 deer/mi², a density well above the 18 deer/mi² generally recommended to protect forest health (Tilghman 1989). Furthermore, studies of the vegetation on the Teatown Lake Reservations found that the average shrub cover of study plots was 17% while the average coverage of ground layer vegetation in these plots was 8%.

Additionally, only 5% of study plots at Teatown contained seedlings of overstory trees. The only woody plant species observed regenerating at Teatown were black cherry and striped maple, two species that are not preferred deer food. In comparison, sites with sustained deer management exhibit tree regeneration (oaks, etc.) in over 60% of study plots (Rubbo, Unpublished Data). This data from Teatown suggested that deer are browsing tree seedlings prevented the forest from regenerating new trees.

Teatown has not managed its deer herd during the past 20 years, but with a mission to protect the diversity of plants, animals, and habitats for future generations made management of the deer herd necessary to move forward. A number of management options were investigated to achieve this goal including: fencing; relocation; fertility control; the use of sharpshooters; and archery hunting. It was determined that fencing would not help to restore the forests at an ecosystem-level and would not reduce the deer herd; relocation is not legal in NY; and fertility control is costly, does not address the current damage, would take more than a decade to see results, and immigration would bring new deer onto Teatown. While legal hunting was considered, archery is the only hunting method allowed in Westchester County. However, archery-only harvest has been found to be less efficient than firearms in controlled hunts (Kilpatrick et al. 2002).

The management technique most likely to meet Teatown's goal was a cull utilizing sharpshooters over bait stations. Teatown proposed to cull approximately 40-60 deer in 2014 to reduce the deer herd to a size that does not negatively impact the forest. Wildlife Services has been requested to conduct the cull, and the NYSDEC would review the project before issuing a permit to harvest the deer.

The expected result of this deer damage management program is the promotion of forest regeneration and health at Teatown Lake Reservation, including an increase in understory and groundcover vegetation and an increase in tree regeneration. Monitoring efforts will allow for assessment of the program's influence on forest health and determine if the numbers of deer harvested will need to be increased or decreased in subsequent years. Once the deer herd has been reduced to appropriate levels, the Teatown Lake Reservation's goal will be to maintain the deer herd at that level through the use of archery or sharp-shooting. Also, 5-year goals of the deer management program include an increase in the average cover of understory and ground cover vegetation on study plots, and an increase in tree regeneration. Data provided through the rigorous assessment of the deer management program will allow for changes to the program if the intended results are not being achieved.

The Teatown Lake Reservation Project was conducted during a period of severe winter weather characterized by snow and excessively cold winter weather over five nights in February 2014. Notification procedures were put in place to inform nearby property owners each evening shooting was to occur. The notification procedures limited the scope of work to be conducted on the property each evening. After five nights a total of eleven deer were removed.

New York City Deer Task Force

White tailed deer were extirpated from New York City sometime in the mid-20th century. However with a lack of predators, prohibition on hunting within city limits and population expansion in neighboring regions, anecdotal reports began circulating of deer in Staten Island and the northern Bronx in the 1990's. Noticeable vegetation browse and deer trails started to appear in city parks by the early 2000's (E. Pehek, Principal Research Ecologist, NYCDPR Natural Resources Group, personal communication).

In 2010 the New York City Department of Parks & Recreation (NYCDPR) produced a white paper on potential deer impacts and management. In that same year the NYSDEC made an online survey available to Staten Island residents to self-report deer sightings. Only 24 deer were initially reported, although NYSDEC continues to collect data (NYSDEC 2008).

In 2011, to initiate deer management discussions in New York City, NYCDPR brought together local and regional experts for a summit in Staten Island. The following year NYCDPR conducted a spot-lighting survey on the island in which 32 deer were observed over 3.44 square miles of the fenced, Fresh Kills Landfill (N. McVay, Research Assistant, NYCDPR Natural Resources Group, personal communication). In 2014-2015 NYCDPR coordinated an aerial infrared survey of green spaces (not the entire island) with 763 deer identified across 19 square miles in Staten Island and 9 deer each identified in parks at opposite sides of the Bronx, Pelham Bay and Van Cortlandt (Bernatas 2015, 2014a, b).

Threats to human health, safety and the environment from a growing deer population are a major concern for the public, government agencies and elected officials:

- Collisions with vehicles are likely to rise as the deer population increases. The Department of Sanitation reported 74 deer carcasses removed from roadsides in 2014 and 11 removed from January to mid-March of 2015 (DSNYC unpublished data).
- The risk from Lyme disease is another concern in New York City. The Department of Health has confirmed the presence of the bacteria that cause Lyme disease in black-legged ticks and stated that 400 - 600 human cases of Lyme are reported each year in NYC (New York City Interagency Deer Task Force 2014).
- An overabundance of deer threatens biodiversity and the long-term sustainability of the city's forests. NYC's multi-layered forests provide habitat for many wildlife species, and a refuge for rare and uncommon plants, many of which are being browsed to the point of extirpation in surrounding regions. In recent years, New York City has embarked on a substantial forest restoration program, and in many locations in Staten Island and the Bronx, severe browse of the planted trees has been observed, placing this sizable investment at risk. The Greenbelt Native Plant Center, which grows plants for City and regional ecological restoration projects, has reported substantial deer browse of their plant inventory. Staten Island's Brookfield Landfill ecological restoration project required the expenditure of \$397,833 on deer exclusion fencing and design to ensure the success of the project (John McLaughlin, Director, Office of Ecological Services, Bureau of Environmental Planning and Analysis, New York City Department of Environmental Protection, personal communication).

To address the impacts of an overabundant deer population in New York City, an inter-agency task force was organized in 2015, which includes local, state, and federal agencies. Wildlife Services is a participant on the inter-agency task force. The group is developing a white paper that will include the results of a public perception survey conducted by Cornell University's Human Dimensions Research Unit; provide data regarding impacts to human health, safety and the environment measured to date; outline procedures for monitoring impacts moving forward; and review management options as they apply to New York City specifically. In addition, the task force is developing educational messaging and outreach materials that will be used to inform the public about the issue and what they can do to minimize impacts from deer overabundance.

Chronic Wasting Disease Surveillance in 2005 and 2009

Two white-tailed deer in two separate captive herds in Oneida County, New York, were confirmed positive for Chronic Wasting Disease (CWD) in late March 2005. The New York WS program was on site within 24 hours in response to a request for assistance from NYSDAM and the United States Department of Agriculture, Animal and Plant Health Inspection Service, Veterinary Services (VS) on April 5, 2005, to depopulate these captive herds. The operation was completed by WS within 48 hours of the official request for assistance. A total of 20 deer were removed from these two captive herds which three additional deer were confirmed positive for CWD on April 8, 2005.

On April 7, 2005, the NYSDEC requested WS assist with an intensive CWD surveillance program involving the collection of 420 wild deer in a 10-mile radius around the captive CWD positive index case. Wild deer collections were conducted by NYSDEC and WS shooting teams for the central New York Operation. The sampling periods were from April 11 to April 22 and from April 25 to April 29, 2005. By April 30, 292 deer were collected including 260 deer that were shot and 32 deer collected as road kills from vehicle-deer collisions. Two wild deer that were collected tested positive for CWD. Testing for CWD was performed by the State's Veterinary Diagnostic Laboratory at Cornell University and confirmed at the National Veterinary Services Laboratory in Ames, Iowa. Both positive wild deer were collected within a mile of the positive index CWD case.

In January 2009, the NYSDEC requested WS assistance with CWD surveillance around the 2005 index case. The goal of this project was targeted surveillance of wild deer within two miles of the 2005 index case. This surveillance would supplement hunter harvested samples in the area. Wild deer collections were conducted by two WS shooting teams at night. In six nights of work, WS collected 21 wild deer which all tested negative for CWD.

1.2.8 Examples of Technical Assistance Projects

Technical assistance to Croton on Hudson, Westchester County

A citizen of Croton on Hudson, Westchester County, contacted WS for assistance with deer damage on May 7, 2012. The WS employee listened to the citizens' report of deer damage threat for a deer-vehicle collision and damage to the forest from deer browsing new wild plant reforestation. The WS employee provided recommendations of legal harvest during the state regulated deer hunting season and getting a permit from the state wildlife agency to shoot deer. The two citizens were sent two informational leaflets about managing deer damage.

Technical Assistance to Town of Southold, Suffolk County, New York

A Wildlife Services wildlife biologist made a site visit to the Town of Southold on September 21, 2011, to meet with 3 citizens reporting deer damage. They were reporting a damage threat to their ornamental flowers and a threat of Lyme disease from deer. This work task documents a one-hour exchange of information where the deer damage was occurring. The citizens had tried eliminating wildlife feeding, using legal hunting during the state regulated deer hunting season and shooting deer under authority of Deer Damage Permits. The wildlife biologist

made recommendations to continue the three current management actions to reduce deer damage to flowers and the Lyme disease threat.

1.3 SCOPE OF THIS ENVIRONMENTAL ASSESSMENT

1.3.1 Actions Analyzed

This EA evaluates the need for white-tailed deer damage management to reduce threats to human safety and to resolve damage to property, natural resources, and agricultural resources on federal, state, tribal, municipal, and private land within the State of New York wherever such management is requested by a cooperator. This EA discusses the issues associated with conducting white-tailed deer damage management in the state to meet the need for action and evaluates different alternatives to meeting that need while addressing those issues.

The methods available for use or recommendation under each of the alternatives evaluated are provided in Appendix B³. The alternatives and Appendix B also discuss how methods would be employed to manage damage and threats associated with white-tailed deer. Therefore, the actions evaluated in this EA are the use of those methods available under the alternatives and the employment of those methods by WS to manage or prevent damage and threats associated with white-tailed deer from occurring when requested by the appropriate resource owner or manager.

1.3.2 Federal, State, County, City, and Private Lands

WS would continue to provide assistance on federal, state, county, municipal, and private land in New York when a request is received for such services by the appropriate resource owner or manager pursuant to the appropriate alternatives. In those cases where a federal agency requests WS' assistance with managing damage caused by white-tailed deer, the requesting agency would be responsible for analyzing those activities in accordance with the NEPA. However, this EA would cover such actions if the requesting federal agency determined the analyses and scope of this EA were appropriate for those actions and the requesting federal agency adopted this EA through their own Decision based on the analyses in this EA. Therefore, actions taken on federal lands have been analyzed in the scope of this EA.

1.3.3 Native American Lands and Tribes

The WS program in New York would only conduct damage management activities on Native American lands when requested by a Native American Tribe. Activities would only be conducted after a Memorandum of Understanding (MOU) or cooperative service agreement had been signed between WS and the Tribe requesting assistance. Therefore, the Tribe would determine when WS' assistance was required and what activities would be allowed. Because Tribal officials would be responsible for requesting assistance from WS and determining what methods would be available to alleviate damage, no conflict with traditional cultural properties or beliefs would be anticipated. Those methods available to alleviate damage associated with white-tailed deer on federal, state, county, municipal, and private properties under the alternatives analyzed in this EA would be available for use to

³A complete list of chemical and non-chemical methods available for use under the identified alternatives, except the alternative with no damage management (Alternative 3), can be found in Appendix B. However, listing methods neither implies that all methods would be used by WS to resolve requests for assistance nor does the listing of methods imply that all methods would be used to resolve every request for assistance.

alleviate damage on Tribal properties when the use of those methods had been approved for use by the Tribe requesting WS' assistance. Therefore, the activities and methods addressed under the alternatives would include those activities that would be employed on Native American lands, when requested and when agreed upon by the Tribe and WS.

1.3.4 Period for which this EA is Valid

The EA would remain valid subject to WS' duties under NEPA and its applicable rules and regulations. Review of the EA, and any new information following the publication of the EA, would be conducted to ensure that WS' activities occur within the parameters evaluated in the EA.

1.3.5 Site Specificity

As mentioned previously, WS would only conduct damage management activities when requested by the appropriate resource owner or manager. In addition, WS activities that would involve the harvest of white-tailed deer under the alternatives would only occur when permitted by the NYSDEC, when required, and only at levels permitted.

This EA analyzes the potential impacts of white-tailed deer damage management based on previous activities conducted on private and public lands in New York where WS and the appropriate entities entered into a MOU, cooperative service agreement, or other comparable document. The EA also addresses the potential impacts of white-tailed deer damage management in areas where additional agreements may be signed in the future. Because the need for action is to reduce damage and because the program's goals and directives would be to provide services when requested, within the constraints of available funding and workforce, it is conceivable that additional damage management efforts would occur. Thus, this EA anticipates those additional efforts and analyzes the impacts of those efforts as part of the alternatives.

Planning for the management of white-tailed deer damage must be viewed as being conceptually similar to the actions of other entities whose missions are to stop or prevent adverse consequences from anticipated future events for which the actual sites and locations where they would occur are unknown but would be anywhere in a defined geographic area. Examples of such agencies and programs include fire and police departments, emergency clean-up organizations, and insurance companies. Although some locations where white-tailed deer damage would occur can be predicted, not all specific locations or times where such damage would occur in any given year can be predicted. In addition, the threshold triggering an entity to request assistance from WS to manage damage associated with white-tailed deer is often unique to the individual; therefore, predicting where and when such a request for assistance would be received by WS is difficult. This EA emphasizes major issues as those issues relate to specific areas whenever possible; however, many issues apply wherever white-tailed deer damage and the resulting management actions occur and are treated as such.

Chapter 2 of this EA identifies and discusses issues relating to white-tailed deer damage management in New York. The standard WS Decision Model (Slate et al. 1992) would be the site-specific procedure for individual actions conducted by WS in the state (see Chapter 3 for a description of the Decision Model and its application).

Decisions made using the model would be in accordance with WS' directives⁴ and Standard Operating Procedures (SOPs) described in this EA as well as relevant laws and regulations.

The analyses in this EA are intended to apply to any action that may occur in any locale and at any time within New York. In this way, WS believes it meets the intent of the NEPA with regard to site-specific analysis and that this is the only practical way for WS to comply with the NEPA and still be able to accomplish its mission.

1.3.6 Summary of Public Involvement

Issues related to white-tailed deer damage management as conducted by WS in New York were initially developed by WS in consultation with the NYSDEC. Issues were defined and preliminary alternatives were identified through the scoping process. As part of this process, and as required by the Council on Environmental Quality (CEQ) and APHIS' NEPA implementing regulations, this document will be noticed to the public for review and comment. The public will be informed through legal notices published in local print media, via a notice on the APHIS stakeholder registry, and by posting the EA on the APHIS website at <http://www.aphis.usda.gov/wildlifedamage/nepa>.

WS will provide for a minimum of a 30-day comment period for the public and interested parties to provide new issues, concerns, and/or alternatives. Through the public involvement process, WS will clearly communicate to the public and interested parties the analyses of potential environmental impacts on the quality of the human environment. New issues or alternatives raised after publication of public notices would be fully considered to determine whether the EA should be revisited and, if appropriate, revised prior to issuance of a final Decision or publication of a notice of intent to prepare an EIS.

1.4 RELATIONSHIP OF THIS EA TO OTHER ENVIRONMENTAL DOCUMENTS

1.4.1 WS' *Environmental Assessments in New York*: WS had previously developed an EA that analyzed the need for action to manage damage associated with white-tailed deer damage in New York (USDA 2003). The EA identified the issues associated with managing damage associated with white-tailed deer in the state and analyzed alternative approaches to meet the specific need identified in those EAs while addressing the identified issues.

Changes in the need for action and the affected environment have prompted WS to initiate this new analysis to address damage management activities. This EA will address more recently identified changes and will assess the potential environmental impacts of program alternatives based on a new need for action, primarily a need to address damage and threats of damage associated with white-tailed deer and to evaluate potential cumulative impacts associated with those activities. Since activities conducted under the previous EAs will be re-evaluated under this EA to address the new need for action and the associated affected environment, the previous EAs that addressed white-tailed deer will be superseded by this analysis and the outcome of the Decision issued based on the analyses in this EA.

⁴At the time of preparation, WS' Directives could be found at the following web address: http://www.aphis.usda.gov/wildlife_damage/ws_directives.shtml.

1.4.2 Management plan for white-tailed deer in New York State 2012-2016: The New York State Department of Environmental Conservation, Bureau of Wildlife has regulatory authority to manage deer in New York and would be the authority to determine if a requested permit to harvest deer would be approved. The state has discretion to deny permits that are contrary to management objectives. Chapter 3 of the management plan addresses managing deer damage, including community-based deer management programs where traditional hunting programs may be unable to reduce damage. Such deer damage situations exist where the local communities requested assistance to reduce deer damage to agriculture, excessive browsing to ornamental plantings, deer-vehicle collisions, loss of native plant species to excessive deer browsing, and tick related disease threats to people.

1.4.3 Final Programmatic Impact Statement on Wildlife Game Species Management Program of the Department of Environmental Conservation, Division of Fish and Wildlife: The New York State Department of Environmental Conservation, Bureau of Wildlife has regulatory authority to manage deer in New York. NYSDEC created this document as a programmatic environmental impact statement to primarily address their wildlife game species management program activities. This includes the interpretation and adjustment of the characteristics of selected wildlife populations, and the regulation of people's actions, to achieve specific goals, and objectives for the recreational, aesthetic, scientific, and commercial uses of wildlife resources.

1.5 AUTHORITY AND COMPLIANCE

The authorities of WS and other agencies as those authorities relate to conducting wildlife damage management activities are discussed by agency in Appendix D. Several laws and regulations pertaining to wildlife damage management activities, including activities conducted in the state are also discussed in Appendix D.

1.6 DECISIONS TO BE MADE

Based on agency relationships, MOUs, and legislative authorities, WS is the lead agency for this EA, and therefore, responsible for the scope, content, and decisions made. Based on the scope of this EA, the decisions to be made are:

- How can WS best respond to the need to reduce deer damage in New York?
- Do the alternatives have potentially significant environmental impacts meriting an Environmental Impact Statement?

CHAPTER 2: AFFECTED ENVIRONMENT AND ISSUES

Chapter 2 contains a discussion of the issues, including issues that will receive detailed environmental impact analysis in Chapter 4 (Environmental Consequences), issues that have driven the development of SOPs, and issues that will not be considered in detail, with rationale. Pertinent portions of the affected environment will be included in this chapter in the discussion of issues. Additional descriptions of the affected environment will be incorporated into the discussion of the environmental effects in Chapter 4.

2.1 AFFECTED ENVIRONMENT

Damage or threats of damage can occur statewide in New York wherever white-tailed deer exist (USDA 2003). White-tailed deer can be found throughout the year across the state where suitable habitat exists for foraging and shelter and are capable of utilizing a variety of habitats. Therefore, requests for assistance to manage damage or threats of damage would occur in any such areas occupied by white-tailed deer. Additional information on the affected environment is provided in Chapter 4.

Upon receiving a request for assistance, activities to reduce white-tailed deer damage or threats would be conducted on federal, state, tribal, municipal, and private properties in New York. Areas where damage or threats of damage would occur include, but would not be limited to agricultural fields, vineyards, orchards, farmyards, dairies, ranches, livestock operations, aquaculture facilities, grain handling areas, industrial sites, natural resource areas, park lands, and historic sites; state and interstate highways and roads; property in or adjacent to subdivisions, businesses, and industrial parks; timberlands, croplands, and pastures; private and public property in rural/urban/suburban areas where white-tailed deer cause damage to landscaping and natural resources, property, and are a threat to human safety through the spread of disease. The area would also include airports and military airbases where white-tailed deer are a threat to human safety and to property; areas where white-tailed deer negatively affect wildlife, including T&E species; and public property where white-tailed deer are negatively affecting historic structures, cultural landscapes, and natural resources.

Activities to reduce white-tailed deer damage have also been conducted by private companies or municipal employees in the state of New York. The village of Tuxedo Park, NY used White Buffalo Inc., a non-profit wildlife management organization based out of Connecticut, to assist village police in a deer cull (Kriz 2012). The village of Hastings-on-Hudson, NY worked alongside the Humane Society and In Defense of Animals to implement a deer immunocontraceptive program (Ross 2013). White-tailed deer management would therefore only be conducted by WS when requested by a landowner or manager, only on properties where a cooperative service agreement or other comparable document were signed between WS and a cooperating entity and a state permit is issued. The harvest of white-tailed deer can only legally occur through the issuance of a permit by the NYSDEC and only at levels specified in the permit.

2.1.1 Environmental Status Quo

As defined by the NEPA implementing regulations, the “*human environment shall be interpreted comprehensively to include the natural and physical environment and the relationship of people with that environment*” (40 CFR 1508.14). Therefore, when a federal action agency analyzes their potential impacts on the “*human environment*”, it is reasonable for that agency to compare not only the effects of

the federal action, but also the potential impacts that occur or would occur in the absence of the federal action by a non-federal entity. This concept is applicable to situations involving federal assistance to reduce damage associated with wildlife species.

Most resident wildlife species are managed under state authority or law without any federal oversight or protection. In addition, most methods available for resolving damage associated with white-tailed deer would also be available for public use. Therefore, WS' decision-making ability would be restricted to one of three alternatives. Wildlife Services would take the action using methods as decided upon by the non-federal entity, provide technical assistance only, or take no action. If no action were taken by WS, the non-federal entity would take the action anyway using the same methods during the hunting season, or through the issuance of a permit by the NYSDEC. Under those circumstances, WS would have virtually no ability to affect the environmental status quo since the action would likely occur in the absence of WS' direct involvement.

2.2 ISSUES ASSOCIATED WITH WHITE-TAILED DEER DAMAGE MANAGEMENT ACTIVITIES

Issues are concerns of the public and/or professional community raised regarding potential adverse effects that might occur from a proposed action. Such issues must be considered in the NEPA decision-making process. Issues related to managing damage associated with white-tailed deer in New York were developed by WS in consultation with NYSDEC, along with those issues addressed during the scoping process during the development of previous EAs (USDA 2003). This EA will also be made available to the public for review and comment to identify additional issues.

The issues, as they relate to the possible implementation of the alternatives, including the proposed action, are discussed in detail in Chapter 4. The issues analyzed in detail in the EA are the following:

2.2.1 Issue 1 - Effects of Damage Management Activities on White-tailed Deer Populations

A common issue when addressing damage caused by wildlife are the potential impacts of management actions on the populations of target species. Methods available to resolve damage or threats to human safety under the alternatives are categorized into lethal and non-lethal methods.

Non-lethal methods would disperse or otherwise make an area unattractive to target species causing damage, which would reduce the presence of those species at the site and potentially the immediate area around the site where non-lethal methods were employed. Lethal methods would be employed to remove white-tailed deer responsible for causing damage or posing threats to human safety. The use of lethal methods would therefore result in local population reductions in the area where damage or threats were occurring. The number of white-tailed deer removed from the population using lethal methods under the alternatives would be dependent on the number of requests for assistance received, the number of individuals involved with the associated damage or threat, and the efficacy of methods employed.

The analysis for magnitude of impact on the populations of those species addressed in the EA would be based on a measure of the number of white-tailed deer killed in relation to that species' abundance. Magnitude may be determined either quantitatively or qualitatively. Quantitative determinations would be

based on population estimates, allowable harvest levels, and actual harvest data. Qualitative determinations would be based on population trends and harvest trend data, when available. Harvest would be monitored by comparing the number of individuals killed with overall population or trends in the population.

Methods available under each of the alternatives to resolve damage and reduce threats to human safety would be employed to target white-tailed deer after applying the WS' Decision Model (Slate et al. 1992) to identify possible techniques.

Effectiveness of White-tailed deer Damage Management Methods

The effectiveness of any damage management program would be defined in terms of losses or risks potentially reduced or prevented. The effectiveness can also be dependent upon how accurately practitioners diagnose the problem, the species responsible for the damage, and how actions were implemented to correct or mitigate risks or damages. To determine that effectiveness, WS must be able to complete management actions expeditiously to minimize harm to non-target animals and the environment, while at the same time, using methods as humanely as possible. The most effective approach to resolving any wildlife damage problem would be to use an adaptive integrated approach, which may call for the use of several management methods simultaneously or sequentially (Courchamp et al. 2003).

The purpose behind integrated management is to implement methods in the most effective manner while minimizing the potentially harmful effects on humans, target and non-target species, and the environment⁵. Efficacy is based on the types of methods employed, the application of the method, restrictions on the use of the method(s), the skill of the personnel using the method and, for WS' personnel, the guidance provided by WS' directives and policies.

The goal would be to reduce damage, risks, and conflicts with wildlife as requested. Localized population reduction would be short-term with new individuals immigrating into the area or born to animals remaining at the site (Courchamp et al. 2003). The ability of an animal population to sustain a certain level of removal and to eventually return to pre-management levels does not mean individual management actions were unsuccessful, but that periodic management may be necessary. The return of wildlife to pre-management levels also demonstrates that limited, localized damage management methods have minimal impacts on species' populations.

Comments are often received that lethal methods would be ineffective because additional white-tailed deer would likely to return to the area. In addition, comments also claim that because white-tailed deer return to an area after initial removal efforts were complete, the use of lethal methods gives the impression of creating a financial incentive to continue the use of only lethal methods. Those statements assume white-tailed deer only return to an area where damage was occurring if lethal methods were used.

However, the use of non-lethal methods would also often be temporary, which would result in white-tailed deer returning to an area where damage was occurring once those methods were no longer used. The common factor when employing any method would be that white-tailed deer would return if suitable conditions continue to exist at the location where damage was occurring and densities were sufficient to occupy all

⁵The cost of management may sometimes be secondary because of overriding environmental, legal, human health and safety, animal welfare, or other concerns.

available habitats to the extent that damage occurs. Therefore, any reduction or prevention of damage from the use of methods addressed in Appendix B would be temporary if habitat conditions continue to exist that attract white-tailed deer to an area where damage was occurring.

Dispersing white-tailed deer using non-lethal methods addressed in Appendix B often requires repeated application to discourage white-tailed deer from returning to locations, which increases costs, moves white-tailed deer to other areas where they would cause damage, and would be temporary if habitat conditions that attracted those white-tailed deer to damage areas remained unchanged. Dispersing or translocating white-tailed deer would be viewed as moving a problem from one area to another, which would require addressing damage caused by those white-tailed deer at another location, which increases costs and would be perceived as creating a financial incentive to continue the use of those methods since white-tailed deer would have to be addressed annually and at multiple locations. Wildlife Services' recommendation of or use of techniques to modify existing habitat or making areas unattractive to white-tailed deer is discussed in Appendix B. Wildlife Services' objective would be to respond to requests for assistance with the most effective methods and to provide for the long-term solution to the problem using WS' Decision Model.

Managing damage caused by white-tailed deer can be divided into short-term redistribution approaches and long-term population and habitat management approaches. Short-term approaches focus on redistribution and dispersal of white-tailed deer to limit use of an area where damage or threats were occurring. Short-term redistribution approaches may include prohibiting feeding, the use of pyrotechnics, propane cannons, effigies, and other adverse noise, erecting access barriers such as fencing, and taste aversion chemicals. Population reduction by limiting survival or reproduction, removing white-tailed deer, and habitat modification would be considered long-term solutions to managing damage caused by wildlife.

Redistribution methods would often be employed to provide immediate resolution to damage occurring until long-term approaches can be implemented or have had time to reach the desired result. Dispersing white-tailed deer can often be a short-term solution that moves those white-tailed deer to other areas where damages or threats would occur. Some short-term methods may become less effective in resolving damage as a white-tailed deer population increases, as white-tailed deer become more acclimated to human activity, and as white-tailed deer become habituated to harassment techniques. Non-lethal methods often require a constant presence at locations when white-tailed deer are present and must be repeated every day or night until the desired results are achieved, which can increase the costs associated with those activities. Non-lethal methods may also require constant monitoring and maintenance to insure proper results. For example, fencing would be used to prevent access to a resource; however, constant monitoring of the fencing would be required and necessary repairs completed to ensure the use of fencing would be successful in preventing access to resources. Long-term solutions to resolving white-tailed deer damage often require management of the population and identifying the habitat characteristics that attract white-tailed deer to a particular location.

Based on the evaluation of the damage situation, the most effective methods would be employed individually or in combination based on prior evaluations of methods or combinations of methods in other damage management situations. Once employed, methods would be further evaluated for effectiveness based on a continuous evaluation of activities by WS. Therefore, the effectiveness of methods would be considered as part of the decision making-process under WS' use of the Decision Model described in Chapter 3 for each damage management request based on the continual evaluation of methods and results.

2.2.2 Issue 2 - Effects on Non-target Plant and Wildlife Species Populations, Including T&E Species

The issue of non-target species effects, including effects on T&E species, arises from the use of non-lethal and lethal methods identified in the alternatives. The use of non-lethal and lethal methods has the potential to inadvertently disperse, capture, or kill non-target wildlife. Methods available for use under the alternatives are described in Appendix B.

Concerns have also been raised about the potential for adverse effects to occur to non-target wildlife from the use of chemical methods. Chemical methods being considered for use to manage damage or threats associated with white-tailed deer include immobilizing drugs, euthanasia chemicals, reproductive inhibitors, and taste repellents. Chemical methods being considered for use to manage damage and threats associated with white-tailed deer in New York are further discussed in Chapter 4 and Appendix B.

The ESA states that all federal agencies “...shall seek to conserve endangered and threatened species and shall utilize their authorities in furtherance of the purposes of the Act” [Sec. 7(a)(1)]. Wildlife Services conducts Section 7 consultations with the USFWS to ensure compliance with the ESA and to ensure that “any action authorized, funded or carried out by such an agency...is not likely to jeopardize the continued existence of any endangered or threatened species...Each agency shall use the best scientific and commercial data available” [Sec. 7(a)(2)].

As part of the scoping process for this EA, WS consulted with the USFWS pursuant to Section 7 of the ESA to facilitate interagency cooperation between WS and the USFWS. The potential effects of the alternatives on this issue are further discussed in Chapter 4.

2.2.3 Issue 3 - Effects of Damage Management Methods on Human Health and Safety

An additional issue often raised is the potential risks to human safety associated with employing methods to manage damage caused by target species. Both chemical and non-chemical methods have the potential to have adverse effects on human safety. Wildlife Services’ employees would use and recommend only those methods that were legally available under each of the alternatives. Still, some concerns exist regarding the safety of methods available despite their legality and selectivity. As a result, this EA will analyze the potential for proposed methods to pose a risk to members of the public. In addition to the potential risks to the public associated with the methods available under each of the alternatives, risks to WS’ employees would also be an issue. Wildlife Services’ employees would potentially be exposed to damage management methods, as well as, subject to workplace accidents. Selection of methods, under the alternatives, would include consideration for public and employee safety.

Safety of Chemical Methods Employed

The issue of using chemical methods as part of managing damage associated with wildlife relates to the potential for human exposure either through direct contact with the chemical or exposure to the chemical from

wildlife that have been exposed. Under the alternatives identified, the use or recommendation of chemical methods would include immobilizing drugs, euthanasia chemicals, reproductive inhibitors, and repellents.

Immobilizing drugs would include ketamine and telazol, which are anesthetics (*i.e.*, general loss of pain and sensation) used during the capture of wildlife to eliminate pain, calm fear, and reduce anxiety in wildlife when handling and transporting wildlife. Xylazine is a sedative that is often used in combination with ketamine to calm nervousness, irritability, and excitement in wildlife during the handling and transporting of wildlife. Euthanasia chemicals would include sodium pentobarbital, Beuthanasia-D[®], Fatal-Plus[™], and potassium chloride, which would general be administered after an animal had been anesthetized. GonaCon[™] is the only product currently registered as a reproductive inhibitor and is only available to manage local deer populations. However, GonaCon[™] is not currently registered for use in the state. If GonaCon[™] became registered to manage local deer populations, the product would only be available for use by WS, the NYSDEC, or persons working under their authority. The application of GonaCon[™] to manage local deer herds would only occur after a permit had been issued by the NYSDEC. Although there have not been studies regarding the effects of GonaCon[™] on humans, the drug appears to work on all mammals. Accidental injection would therefore likely cause similar lack of reproductive success in both men and women (John Eisemann, USDA Wildlife Services, personal communication), and may cause infertility in women (GonaCon[™] product label 2009). Pregnant women are advised not to handle or administer GonaCon[™] (GonaCon[™] product label 2009).

Repellents for white-tailed deer contain different active ingredients with most ingredients occurring naturally in the environment. The most common ingredients of repellents are coyote urine, putrescent whole egg solids, and capsaicin. Repellents are usually classified as general-use products. Repellents are generally applied directly to affected resources and elicit an adverse taste response when ingested or cause temporarily sickness (*e.g.*, nausea). Products containing coyote urine or other odors associated with predatory wildlife are intended to elicit a fright response in target wildlife by imitating the presence of a predatory animal (*i.e.*, wildlife tend to avoid areas where predators are known to occur). Wildlife Services would only employ or recommend for use those repellents that were registered for use pursuant to the FIFRA with the EPA and were registered for use by the NYSDEC Bureau of Pesticides.

The issue of the potential for drugs used in animal capture, handling, and euthanasia to cause adverse health effects in humans that hunt and consume the species involved has been raised. Among the species to be captured and handled under the proposed action, this issue is expected to be of concern for wildlife that are hunted and sometimes consumed by people as food. Chemicals methods available for use under the relevant alternatives would be regulated by the EPA through FIFRA, by New York laws, by the Drug Enforcement Administration (DEA), by the Food and Drug Administration (FDA), and by WS' Directives.

Safety of Non-Chemical Methods Employed

Most methods available to alleviate damage and threats associated with white-tailed deer are considered non-chemical methods. The primary safety risk of most non-chemical methods occurs directly to the applicator or those persons assisting the applicator. However, risks to others do exist when employing non-chemical methods, such as when using firearms, cannon nets, pyrotechnics. Most of the non-chemical methods available to address white-tailed deer damage in New York would be available for use under any of the alternatives and would be employed by any entity, when permitted. Risks to human safety from the use of non-chemical methods will be

further evaluated as this issue relates to the alternatives in Chapter 4. A complete list of non-chemical methods available to alleviate damage associated with white-tailed deer is provided in Appendix B of this EA.

2.2.4 Issue 4 - Effects on the Socio-cultural Elements of the Human Environment

One issue is the concern that the proposed action or the other alternatives would result in the loss of aesthetic benefits of white-tailed deer to the public, resource owners, or neighboring residents. Wildlife generally is regarded as providing economic, recreational, and aesthetic benefits (Decker and Goff 1987), and the mere knowledge that wildlife exists is a positive benefit to many people. Aesthetics is the philosophy dealing with the nature of beauty, or the appreciation of beauty. Therefore, aesthetics is truly subjective in nature, dependent on what an observer regards as beautiful.

The human attraction to animals has been well documented throughout history and started when humans began domesticating animals. The public share a similar bond with animals and/or wildlife in general and in modern societies, a large percentage of households have indoor or outdoor pets. However, some people may consider individual wild animals and white-tailed deer as “*pets*” or exhibit affection toward those animals, especially people who enjoy viewing wildlife. Therefore, the public reaction can be variable and mixed to wildlife damage management because there are numerous philosophical, aesthetic, and personal attitudes, values, and opinions about the best ways to manage conflicts/problems between humans and wildlife.

Wildlife populations provide a wide range of social and economic benefits (Decker and Goff 1987). Those include direct benefits related to consumptive and non-consumptive uses, indirect benefits derived from vicarious wildlife related experiences, and the personal enjoyment of knowing wildlife exists and contributes to the stability of natural ecosystems (Bishop 1987). Direct benefits are derived from a personal relationship with animals and may take the form of direct consumptive use (*i.e.*, using parts of or the entire animal) or non-consumptive use (*e.g.*, viewing the animal in nature or in a zoo, photographing) (Decker and Goff 1987).

Indirect benefits or indirect exercised values arise without the user being in direct contact with the animal and come from experiences such as looking at photographs and films of wildlife, reading about wildlife, or benefiting from activities or contributions of animals such as their use in research (Decker and Goff 1987). Indirect benefits come in two forms: bequest and pure existence (Decker and Goff 1987). Bequest is providing for future generations and pure existence is merely knowledge that the animals exist (Decker and Goff 1987).

Public attitudes toward wildlife vary considerably. Some people believe that all wildlife should be captured and translocated to another area to alleviate damage or threats to protected resources. Some people directly affected by the problems caused by wildlife strongly support removal. Individuals not directly affected by the harm or damage may be supportive, neutral, or totally opposed to any removal of wildlife from specific locations or sites. Some people totally opposed to wildlife damage management want WS to teach tolerance for damage and threats caused by wildlife, and that wildlife should never be killed. Some of the people who oppose removal of wildlife do so because of human-affectionate bonds with individual wildlife or escaped domestic animals. Those human-affectionate bonds are similar to attitudes of a pet owner and result in aesthetic enjoyment.

Some individuals are offended by the presence of overabundant white-tailed deer. To such people deer represent pests that are nuisances, which upset the natural order in ecosystems, and are carriers of diseases transmissible to humans or other wildlife. Their overall enjoyment of other animals is diminished by what they view as a destructive presence of such species. They are offended because they feel that white-tailed deer proliferate in such numbers and appear to remain unbalanced.

2.2.5 Issue 5 - Humaneness and Animal Welfare Concerns of Methods

The issue of humaneness and animal welfare, as it relates to the killing or capturing of wildlife is an important but very complex concept that can be interpreted in a variety of ways. Schmidt (1989) indicated that vertebrate damage management for societal benefits would be compatible with animal welfare concerns, if “...*the reduction of pain, suffering, and unnecessary death is incorporated in the decision making process.*” According to the American Veterinary Medical Association (AVMA) (1987), suffering is described as a “...*highly unpleasant emotional response usually associated with pain and distress.*” However, suffering “...*can occur without pain...*” and “...*pain can occur without suffering...*”. Because suffering carries with it the implication of a time frame, a case would be made for “...*little or no suffering where death comes immediately...*” (California Department of Fish and Game 1991). Pain and physical restraint can cause stress in animals and the inability of animals to effectively deal with those stressors can lead to distress. Suffering occurs when action is not taken to alleviate conditions that cause pain or distress in animals.

Defining pain as a component in humaneness appears to be a greater challenge than that of suffering. Pain obviously occurs in animals. Altered physiology and behavior can be indicators of pain, and identifying the causes that elicit pain responses in humans would “...*probably be causes for pain in other animals...*” (AVMA 1987). However, pain experienced by individual animals probably ranges from little or no pain to considerable pain (California Department of Fish and Game 1991).

Pain and suffering, as it relates to methods available for use to manage white-tailed deer has both a professional and lay point of arbitration. Wildlife managers and the public would be better served to recognize the complexity of defining suffering, since “...*neither medical nor veterinary curricula explicitly address suffering or its relief*” (California Department of Fish and Game 1991). Research has not yet progressed to the development of objective, quantitative measurements of pain or stress for use in evaluating humaneness.

The AVMA states “...*euthanasia is the act of inducing humane death in an animal*” and “... *the technique should minimize any stress and anxiety experienced by the animal prior to unconsciousness*” (Beaver et al. 2001). Some people would prefer AVMA accepted methods of euthanasia to be used when killing all animals, including wild and invasive animals. The AVMA states “*For wild and feral animals, many of the recommended means of euthanasia for captive animals are not feasible. In field circumstances, wildlife biologists generally do not use the term euthanasia, but terms such as killing, collecting, or harvesting, recognizing that a distress-free death may not be possible*” (Beaver et al. 2001).

The decision-making process involves tradeoffs between the above aspects of pain and humaneness. Therefore, humaneness, in part, appears to be a person’s perception of harm or pain inflicted on an animal, and

people may perceive the humaneness of an action differently. The challenge in coping with this issue is how to achieve the least amount of animal suffering. The issue of humanness and animal welfare concerns will be further discussed in Chapter 4. SOPs to alleviate pain and suffering are discussed in Chapter 3.

2.2.6 Issue 6 - Effects of White-tailed Deer Damage Management Activities on the Regulated Harvest of White-tailed deer

Another issue commonly identified is a concern that damage management activities conducted by WS would affect the ability of persons to harvest white-tailed deer during the regulated hunting seasons either by reducing local populations through the lethal removal of white-tailed deer or by reducing the number of white-tailed deer present in an area through dispersal techniques. White-tailed deer can be hunted during regulated seasons (NYSDEC 2014a). Potential impacts would arise from the use of non-lethal or lethal damage management methods. Non-lethal methods used to reduce or alleviate damage caused by white-tailed deer are used to reduce white-tailed deer densities through dispersal in areas where damage or the threat of damage is occurring. Similarly, lethal methods used to reduce damage associated with white-tailed deer would lower densities in areas where damage is occurring resulting in a reduction in the availability of those deer during the regulated harvest season.

2.3 ISSUES CONSIDERED BUT NOT IN DETAIL WITH RATIONALE

Additional issues were also identified by WS and the NYSDEC during the scoping process of this EA. Furthermore, some issues identified below have been received through previous public comments and we anticipate receiving similar comments. Those additional issues were considered but detailed analyses will not occur for the reasons provided. The following issues were considered but were not analyzed in detail:

2.3.1 Appropriateness of Preparing an EA (Instead of an EIS) For Such a Large Area

A concern was raised that an EA for an area as large as the State of New York would not meet the NEPA requirements for site specificity. Wildlife damage management falls within the category of federal or other regulatory agency actions in which the exact timing or location of individual activities cannot usually be predicted well enough ahead of time to describe accurately such locations or times in an EA or EIS. Although WS can predict some of the possible locations or types of situations and sites where some kinds of wildlife damage would occur, the program cannot predict the specific locations or times at which affected resource owners would determine a damage problem has become intolerable to the point that they request assistance from WS.

Lead agencies have the discretion to determine the geographic scope of their analyses under the NEPA (Kleppe v Sierra Club, 427 U.S. 390, 414 (1976), CEQ 1508.25). Ordinarily, according to APHIS procedures implementing the NEPA, WS' individual wildlife damage management actions would be categorically excluded (7 CFR 372.5(c)). The intent in developing this EA was to determine if the proposed action or the other alternatives would potentially have significant individual and/or cumulative impacts on the quality of the human environment that would warrant the preparation of an EIS. This EA addresses impacts for managing damage and threats to human safety associated with white-tailed deer in the state to analyze individual and cumulative impacts and to provide a thorough analysis.

In terms of considering cumulative effects, one EA analyzing impacts for the entire state would provide a more comprehensive and less redundant analysis than multiple EAs covering smaller areas. If a determination were made through this EA that the proposed action or the other alternatives might have a significant impact on the quality of the human environment, then an EIS would be prepared. Based on previous requests for assistance, the WS program in New York would continue to conduct white-tailed deer damage management in a very small percentage of land area in the state where damage was occurring or likely to occur.

2.3.2 WS' Impact on Biodiversity

The WS program does not attempt to eradicate any species of native wildlife. Wildlife Services operates in accordance with federal, and state laws and regulations enacted to ensure species viability. Methods available are employed to target white-tailed deer identified as causing damage or posing a threat of damage. Any reduction of a local population or group is frequently temporary because immigration from adjacent areas or reproduction replaces the animals removed. Wildlife Services operates on a small percentage of the land area of New York and only targets those white-tailed deer identified as causing damage or posing a threat. Therefore, activities conducted pursuant to any of the alternatives would not adversely affect biodiversity. More likely, WS management of deer damage would result in an increase in biodiversity at the local level.

2.3.3 A Loss Threshold Should Be Established Before Allowing Lethal Methods

One issue identified through WS' implementation of the NEPA processes is a concern that a threshold of loss should be established before employing lethal methods to resolve damage and that wildlife damage should be a cost of doing business. Some damage and economic loss would likely be tolerated by cooperators until the damage reaches a threshold where the damage becomes an economic burden. The appropriate level of allowed tolerance or threshold before employing lethal methods would differ among cooperators and damage situations. In addition, establishing a threshold would be difficult or inappropriate to apply to human health and safety situations. For example, aircraft striking white-tailed deer can lead to property damage and can threaten passenger safety if a catastrophic failure of the aircraft occurs because of the strike. Therefore, addressing the threats of wildlife strikes prior to an actual strike occurring would be appropriate.

2.3.4 White-tailed deer Damage Management Should Not Occur at Taxpayer Expense

An issue identified is the concern that wildlife damage management should not be provided at the expense of the taxpayer and that activities should be fee-based. Federally appropriated funds and cooperative funds are used to fund the WS' program, including field activities, employees' salaries, travel, supplies, and equipment. Activities conducted for the management of damage and threats to human safety from white-tailed deer would be funded through cooperative service agreements with individual property owners or managers. A minimal federal appropriation is allotted for the maintenance of a WS program in New York. The remainder of the WS program would mostly be fee-based. Technical assistance would be provided to requesters as part of the federally funded activities, but the majority of direct assistance in which WS' employees perform damage management activities would be funded through cooperative service agreements between the requester and WS.

2.3.5 Cost Effectiveness of Management Methods

The CEQ does not require a formal, monetized cost benefit analysis to comply with the NEPA. Consideration of this issue is not essential to making a reasoned choice among the alternatives being considered. However, the methods determined to be most effective to reduce damage and threats to human safety caused by white-tailed deer and that prove to be the most cost effective would likely receive the greatest application. As part of an integrated approach and as part of the WS Decision Model, evaluation of methods would continually occur to allow for those methods that were most effective at resolving damage or threats to be employed under similar circumstance where white-tailed deer were causing damage or posing a threat. Additionally, management operations may be constrained by cooperator funding and/or objectives and needs. The cost effectiveness of methods and the effectiveness of methods would be linked. The issue of cost effectiveness as it relates to the effectiveness of methods is discussed in the following issue.

2.3.6 White-tailed Deer Damage Should Be Managed by Private Nuisance Wildlife Control Agents

Wildlife control agents and private entities would be contacted to reduce white-tailed deer damage when deemed appropriate by the resource owner. Wildlife Services would refer persons requesting assistance to agents under all of the alternatives fully evaluated in the EA.

WS Directive 3.101 provides guidance on establishing cooperative projects and interfacing with private businesses. Wildlife Services only responds to requests for assistance received. When responding to requests for assistance, WS would inform requesters that other service providers, including private entities, might be available to provide assistance.

2.3.7 Effects from the Use of Lead Ammunition in Firearms

Questions have arisen about the deposition of lead into the environment from ammunition used in firearms to harvest white-tailed deer. As described in Appendix B, the lethal removal of white-tailed deer with firearms by WS to alleviate damage or threats would occur using a handgun, rifle, or shotgun. In an ecological risk assessment of lead shot exposure in non-waterfowl birds, ingestion of lead shot was identified as the concern rather than just contact with lead shot or lead leaching from shot in the environment (Kendall et al. 1996).

The harvest of white-tailed deer by WS using firearms would occur primarily from the use of rifles. However, the use of shotguns or handguns would be employed in some situations. To reduce risks to human safety and property damage from bullets passing through white-tailed deer, the use of rifles would be applied in such a way (*e.g.*, caliber, bullet weight, distance) to minimize bullets passing through white-tailed deer, especially in urban or suburban areas. Deer that are removed using rifles would occur within areas where retrieval of all white-tailed deer carcasses for proper disposal is highly likely (*e.g.*, at an airport). With risks of lead exposure occurring primarily from ingestion of bullet fragments, the retrieval and proper disposal of deer carcasses would greatly reduce the risk of scavengers ingesting or being exposed to lead that may be contained within the carcass.

However, deposition of lead into soil would occur if, during the use of a rifle, the projectile passes through a white-tailed deer, if misses occur, or if the white-tailed deer carcass was not retrieved. Laidlaw et al. (2005)

reported that, because of the low mobility of lead in soil, all of the lead that accumulates on the surface layer of the soil is generally retained within the top 20 cm (about 8 inches). In addition, concerns occur that lead from bullets deposited in soil from shooting activities would contaminate ground water or surface water from runoff. Stansley et al. (1992) studied lead levels in water that was subjected directly to high concentrations of lead shot accumulation because of intensive target shooting at several shooting ranges.

Lead did not appear to “*transport*” readily in surface water when soils were neutral or slightly alkaline in pH (*i.e.*, not acidic), but lead did transport more readily under slightly acidic conditions. Although Stansley et al. (1992) detected elevated lead levels in water in a stream and a marsh that were in the shot “*fall zones*” at a shooting range, the study did not find higher lead levels in a lake into which the stream drained, except for one sample collected near a parking lot. Stansley et al. (1992) believed the lead contamination near the parking lot was due to runoff from the lot, and not from the shooting range areas. The study also indicated that even when lead shot was highly accumulated in areas with permanent water bodies present, the lead did not necessarily cause elevated lead levels in water further downstream. Muscle samples from two species of fish collected in water bodies with high lead shot accumulations had lead levels that were well below the accepted threshold standard of safety for human consumption (Stansley et al. 1992).

Craig et al. (1999) reported that lead levels in water draining away from a shooting range with high accumulations of lead bullets in the soil around the impact areas were far below the “*action level*” of 15 parts per billion as defined by the EPA (*i.e.*, requiring action to treat the water to remove lead). The study found that the dissolution (*i.e.*, capability of dissolving in water) of lead declines when lead oxides form on the surface areas of the spent bullets and fragments (Craig et al. 1999). Therefore, the transport of lead from bullets or shot distributed across the landscape was reduced once the bullets and shot formed crusty lead oxide deposits on their surfaces, which served to reduce naturally the potential for ground or surface water contamination (Craig et al. 1999). Those studies suggest that, given the very low amount of lead being deposited and the concentrations that would occur from WS’ activities to reduce white-tailed deer damage using firearms, as well as most other forms of dry land small game hunting in general, lead contamination of water from such sources would be minimal to nonexistent.

A secondary concern surrounding lead ammunition surrounds the issue of lead deposition in meat, particularly meat that is donated to various charities. Stewart and Veverka (2011) documented that white-tailed deer that were shot with lead ammunition in the head or extreme upper neck in sharpshooting situations showed no deposition of lead fragments in the meat of the animals that would have been processed for human consumption. Wildlife Services’ personnel would be trained to shoot and target the head and neck of white-tailed deer.

Since those white-tailed deer harvested by WS using firearms would be harvested by the entities experiencing damage using the same method in the absence of WS’ involvement, WS’ assistance with removing those white-tailed deer would not be additive to the environmental status quo. The amount of lead deposited into the environment would be lowered by WS’ involvement in damage management activities due to efforts by WS to use frangible bullets to minimize bullet pass through which limits the amount of lead in the environment. Wildlife Services would choose to use the smallest caliber rifle feasible to shoot deer, especially in urban and suburban areas, to humanely kill the deer while minimizing the bullet fragments passing through. The proficiency training received by WS’ employees in firearm use and accuracy would increase the likelihood that

white-tailed deer were harvested humanely in situations that ensure accuracy and that misses occur infrequently which further reduces the potential for lead to be deposited in the soil from misses or from projectiles passing through carcasses. In addition, WS' involvement ensures white-tailed deer carcasses harvested using firearms would be retrieved and disposed of properly to prevent the ingestion of lead in carcasses by sensitive scavengers (e.g., bald eagles). Based on current information, the risks associated with lead bullets that would be deposited into the environment from WS' activities due to misses, the bullet passing through the carcass, or from white-tailed deer carcasses that may be irretrievable would be below any level that would pose any risk from exposure or significant contamination of water.

2.3.8 Effects on Human Health from Consumption of Deer Meat Donated by WS

Of concern under this issue would be the consumption of deer meat donated to a charitable organization after being harvested by WS. Of recent concern is the potential for lead and other contaminants to be present in meat that has been processed for human consumption. The potential for the spreading of zoonotic diseases in deer processed and donated for human consumption is also a concern. Under the proposed action alternative, meat from deer harvested during damage management activities would be donated to charitable organizations for human consumption. Only meat from deer would be donated under the proposed action alternative. Wildlife Services would recommend the donation or consumption of meat under the technical assistance only alternative but would not be directly involved with damage management activities under that alternative.

The Brookhaven National Laboratory (BNL), located on Long Island, New York, is a Department of Energy (DOE) facility. It has operated continuously since 1947. BNL activities include research in physics, chemistry, biology, materials science, and medicine. In the past, waste disposal and air releases from some of these activities were not always in accordance with today's standards. Deer sampling indicates that the consumption of deer meat would not result in adverse health effects (Brookhaven National Laboratory 2011).

2.3.9 A Site Specific Analysis Should be Made for Every Location Where White-tailed deer Damage Management Would Occur

The underlying intent for preparing an EA is to determine if a proposed action might have a significant impact on the human environment. Wildlife Services' EA development process is issue driven, meaning issues that were raised during the interdisciplinary process and through public involvement that were substantive, were used to drive the analysis and determine the significance of the environmental impacts of the proposed action and the alternatives. Therefore, the level of site specificity must be appropriate to the issues listed.

The analysis in this EA was driven by the issues raised during the scoping process during the development of the EA. In addition to the analysis contained in this EA, WS' personnel use the WS Decision Model (Slate et al. 1992) described in Chapter 3 as a site-specific tool to develop the most appropriate strategy at each location. The WS Decision Model is an analytical thought process used by WS' personnel for evaluating and responding to requests for assistance.

As discussed previously, one EA analyzing impacts for the entire state would provide a more comprehensive and less redundant analysis that allows for a better cumulative impact analysis. If a determination were made through

this EA that the alternatives developed to meet the need for action would result in a significant impact on the quality of the human environment, then an EIS would be prepared.

2.3.10 Global Climate Change/Greenhouse Gas Emissions

The WS program activities that may result from the alternatives would have a negligible effect on atmospheric conditions including the global climate. Meaningful direct or indirect emissions of greenhouse gases would not occur as a result of the proposed action. The proposed action would meet requirements of applicable federal laws, regulations, and Executive Orders including the Clean Air Act and Executive Order 13514.

CHAPTER 3: ALTERNATIVES

Chapter 3 contains a discussion of the alternatives that were developed to meet the need for action discussed in Chapter 1 and to address the identified issues discussed in Chapter 2. Alternatives were developed for consideration based on the need for action and issues using the WS Decision model (Slate et al. 1992). The alternatives will receive detailed environmental impacts analysis in Chapter 4 (Environmental Consequences). Chapter 3 also discusses alternatives considered but not analyzed in detail, with rationale. SOPs for white-tailed deer damage management in New York are also discussed in Chapter 3.

3.1 DESCRIPTION OF THE ALTERNATIVES

The following alternatives were developed to meet the need for action and address the identified issues associated with managing damage caused by white-tailed deer:

3.1.1 Alternative 1 - Continue the Current White-tailed Deer Damage Management Program (No Action/Proposed Action)

The proposed action/no action alternative would continue the current implementation of an adaptive integrated approach utilizing non-lethal and lethal techniques, when requested, and as deemed appropriate using the WS Decision Model, to reduce damage and threats caused by white-tailed deer in New York. A major goal of the program would be to resolve and prevent damage caused by white-tailed deer and to reduce threats to human safety. To meet this goal, WS, in consultation the NYSDEC, would continue to respond to requests for assistance with, at a minimum, technical assistance, or when funding was available, operational damage management. The adaptive approach to managing damage associated with white-tailed deer would integrate the use of the most practical and effective methods to resolve a request for damage management as determined by a site-specific evaluation to reduce damage or threats to human safety for each request. City/town managers, agricultural producers, property owners, and others requesting assistance would be provided information regarding the use of appropriate non-lethal and lethal techniques.

Under this alternative, WS would respond to requests for assistance by: 1) taking no action, if warranted, 2) providing only technical assistance to property owners or managers on actions they would take to reduce damages caused by white-tailed deer, or 3) providing technical assistance and direct operational assistance to a property owner or manager experiencing damage. The harvest of white-tailed deer can only legally occur through the issuance of a permit by the NYSDEC and only at levels specified in the permit.

Property owners or managers requesting assistance from WS would be provided with information regarding the use of effective and practical non-lethal and lethal techniques. Preference would be given to non-lethal methods when practical and effective under this alternative (see WS Directive 2.101). Property owners or managers may choose to implement WS' recommendations on their own (*i.e.*, technical assistance), use contractual services of private businesses, use volunteer services of private organizations, use the services of WS (*i.e.*, direct operational assistance), take the management action themselves, or take no further action.

WS would work with those persons experiencing white-tailed deer damage in addressing those white-tailed deer responsible for causing damage as expeditiously as possible. To be most effective, damage management activities

should occur as soon as white-tailed deer begin to cause damage. White-tailed deer damage that has been ongoing can be difficult to resolve using available methods since white-tailed deer would be conditioned to an area and would be familiar with a particular location. Deer damage can be difficult to resolve if people wait until damage is at crisis levels before implementing abatement activities or seeking assistance. Subsequently, making that area unattractive using available methods would be difficult to achieve once damage was ongoing. Wildlife Services would work closely with those entities requesting assistance to identify situations where damage would occur and begin to implement damage management activities under this alternative as early as possible to increase the likelihood of those methods achieving the level of damage reduction requested by the cooperating entity.

WS' Decision Model would be the implementing mechanism for a damage management program under the proposed action alternative that would be adapted to an individual damage situation that allows for the broadest range of methods to be used to address damage or the threat of damage in the most effective, most efficient, and most environmentally conscious way available. When WS receives a request for direct operational assistance, WS would conduct site visits to assess damage or threats, would identify the cause of the damage, and would apply the Decision Model described by Slate et al. (1992) and WS Directive 2.201 to determine the appropriate methods to resolve or prevent damage. The use of the Decision model by WS' employees under the proposed action is further discussed below.

Non-lethal methods that would be available for use or recommended by WS under this alternative include, but are not limited to minor habitat modifications, planting less preferred ornamental flowers and shrubs, behavior modification, lure crops, visual deterrents, exclusionary devices, frightening devices, reproductive inhibitors (if registered in New York), sterilization, immobilizing drugs, and chemical repellents, and other methods approved by the NYSDEC (see Appendix B for a list and description of potential methods). Lethal methods that would be available to WS under this alternative include the recommendation of harvest during legal hunting seasons, euthanasia chemicals, and shooting when permitted. In addition, white-tailed deer live-captured using non-lethal methods (*e.g.*, drop nets, immobilizing drugs and other permitted live capture methods) would be euthanized. The lethal control of target white-tailed deer would comply with WS Directive 2.505, "Wildlife Euthanasia."

Listing methods does not imply that all methods would be used or recommended by WS to resolve requests for assistance and does not imply that all methods would be used to resolve every request for assistance. The most appropriate response would often be a combination of non-lethal and lethal methods, or there would be instances where application of lethal methods alone would be the most appropriate strategy. For example, if an entity requesting assistance had already attempted to alleviate damage using non-lethal methods, WS would not necessarily employ those same non-lethal methods, since those methods were proven ineffective at reducing damage or threats to an acceptable level to the requester.

Many lethal and non-lethal methods are intended to be short-term attempts at reducing damage occurring at the time those methods are employed. Long-term solutions to managing white-tailed deer damage would include limited habitat manipulations and changes in cultural practices, which are addressed further below and in Appendix B.

Non-lethal methods can disperse or otherwise make an area unattractive to white-tailed deer causing damage, thereby reducing the presence of white-tailed deer at the site and potentially the immediate area around the site where non-lethal methods were employed. Non-lethal methods would be given priority when addressing requests

for assistance (see WS Directive 2.101). However, non-lethal methods would not necessarily be employed to resolve every request for assistance if deemed inappropriate by WS' personnel using the WS Decision Model, especially when the requesting entity has used non-lethal methods previously and found those methods to be inadequate to resolving the damage or threats of damage. Non-lethal methods would be used to exclude, harass, and disperse target wildlife from areas where damage or threats were occurring. When effective, non-lethal methods would disperse white-tailed deer from an area resulting in a reduction in the presence of those white-tailed deer at the site where those methods were employed. For any management methods employed, the proper timing would be essential in effectively dispersing those white-tailed deer causing damage. Employing methods soon after damage begins or soon after threats were identified increases the likelihood that those damage management activities would achieve success in addressing damage. Therefore, coordination and timing of methods would be necessary to be effective in achieving expedient resolution of white-tailed deer damage.

Under the proposed action alternative, WS would employ only non-lethal methods when determined to be appropriate for each request for assistance to alleviate damage or reduce threats of damage using the WS Decision Model. In some situations, a cooperating entity has tried to employ non-lethal methods to resolve damage prior to contacting WS for assistance. In those cases, the methods employed by the requester were either unsuccessful or the reduction in damage or threats had not reached a level that was tolerable by the requesting entity. In those situations, WS would employ other non-lethal methods, attempt to apply the same non-lethal methods, or employ lethal methods. In many situations, the implementation of non-lethal methods, such as exclusion-type barriers or deer resistant ornamental plantings, would be the responsibility of the requestor, which means that, in those situations, the only function of WS would be to implement lethal methods, if determined to be appropriate using the WS Decision Model.

Lethal methods would be employed to resolve damage associated with those white-tailed deer identified by WS as responsible for causing damage or threats to human safety under this alternative; however, WS would only employ lethal methods after receiving a request for the use of those methods. The use of lethal methods would result in local population reductions in the area where damage or threats were occurring since white-tailed deer would be removed from the population. Lethal methods would often be employed to reinforce non-lethal methods and to remove white-tailed deer that were identified as causing damage or posing a threat to human safety. The use of lethal methods would result in local reductions of white-tailed deer in the area where damage or threats were occurring. The number of white-tailed deer removed from the population using lethal methods under the proposed action would be dependent on the number of requests for assistance received, the number of white-tailed deer involved with the associated damage or threat, and the efficacy of methods employed.

Often of concern with the use of lethal methods is that white-tailed deer that were harvested would only be replaced by other white-tailed deer either during the application of those methods (*e.g.*, white-tailed deer that relocate into the area) or by white-tailed deer the following year (*e.g.*, increase in reproduction and survivability that would result from less competition). As stated previously, the use of lethal methods would not be used as population management tools over broad areas. The use of lethal methods would be intended to reduce the number of white-tailed deer present at a specific location where damage was occurring by targeting those white-tailed deer causing damage or posing threats. The intent of lethal methods would be to manage only those white-tailed deer causing damage and not to manage entire white-tailed deer populations.

Most lethal and non-lethal methods currently available provide only short-term benefits when addressing white-tailed deer damage. The use of those methods would be intended to reduce damage occurring at the time those methods were employed but do not necessarily ensure white-tailed deer would not return once those methods were discontinued. Long-term solutions to resolving deer damage would often be complex to implement and can be costly. In some cases, long-term solutions involve planting ornamental flowers and shrubs less palatable to deer would be less costly or complex than exclusionary devices, such as fencing. When addressing white-tailed deer damage, long-term solutions generally involve modifying existing habitat, making conditions less attractive to white-tailed deer or increasing effectiveness of legal hunting programs. To ensure complete success, alternative sites in areas where damage was not likely to occur would often be required to achieve complete success in reducing damage and to avoid moving the problem from one area to another. Modifying a site to be less attractive to white-tailed deer would likely result in the dispersal of those white-tailed deer to other areas where damage would occur or would result in multiple occurrences of damage situations.

WS may recommend white-tailed deer be harvested during the regulated hunting season for those species in an attempt to reduce the number of white-tailed deer causing damage. Managing white-tailed deer populations over broad areas would lead to a decrease in the number of white-tailed deer causing damage. Establishing hunting seasons and the allowed harvest during those seasons is the responsibility of the NYSDEC. Wildlife Services does not have the authority to establish hunting seasons or to set allowed harvest numbers during those seasons.

A complete list of chemical and non-chemical methods available for use under this alternative can be found in Appendix B. However, listing methods neither implies that all methods would be used by WS to resolve requests for assistance nor does the listing of methods imply that all methods would be used to resolve every request for assistance. As part of an integrated approach, WS may provide technical assistance and direct operational assistance to those people experiencing damage associated with white-tailed deer.

Technical Assistance Recommendations

Under the proposed action, WS would provide technical assistance to those persons requesting assistance with managing damage as part of an integrated approach. Technical assistance would occur as described in Alternative 2 of this EA.

Operational Damage Management Assistance

Operational damage management assistance would include damage management activities that were directly conducted by or supervised by WS personnel. Operational damage management assistance would be initiated when the problem would not be effectively resolved through technical assistance alone and there was a written MOU, cooperative service agreement, or other comparable document signed between WS and the entity requesting assistance. The initial investigation by WS' personnel would define the nature, history, and extent of the problem; species responsible for the damage; and methods available to resolve the problem. The professional skills of WS' personnel would be required to effectively resolve problems, especially if chemical methods were necessary or if the problems were complex.

Educational Efforts

Education is an important element of activities because wildlife damage management is about finding compromise and coexistence between the needs of people and needs of wildlife. This is extremely challenging as nature is in continual flux. In addition to the routine dissemination of recommendations and information to individuals or organizations, WS provides lectures, courses, and demonstrations to producers, homeowners, state and county agents, colleges and universities, and other interested groups. Wildlife Services frequently cooperates with other entities in education and public information efforts. Additionally, technical papers have been and would continue to be presented at professional meetings and conferences so that other wildlife professionals and the public were periodically updated on recent developments in damage management technology, programs, laws and regulations, and agency policies.

Research and Development

The National Wildlife Research Center (NWRC) functions as the research unit of WS by providing scientific information and the development of methods for wildlife damage management, which are effective and environmentally responsible. Research biologists with the NWRC work closely with wildlife managers, researchers, and others to develop and evaluate methods and techniques for managing wildlife damage. For example, research biologists from the NWRC were involved with developing and evaluating the reproductive inhibitor known under the trade name of GonaCon™. Research biologists with the NWRC have authored hundreds of scientific publications and reports based on research conducted involving wildlife and methods.

WS' Decision Making Procedures

WS' personnel would use a thought process for evaluating and responding to damage complaints that is depicted by the WS Decision Model (see WS Directive 2.201) and described by Slate et al. (1992). Wildlife Services' personnel would assess the problem and then evaluate the appropriateness and availability (legal and administrative) of strategies and methods based on biological, economic, and social considerations. Following this evaluation, methods deemed to be practical for the situation would be incorporated into a damage management strategy. After this strategy was implemented, monitoring would be conducted and evaluation would continue to assess the effectiveness of the strategy. If the strategy were effective, the need for further management would be ended. In terms of the WS Decision Model, most efforts to resolve wildlife damage consist of continuous feedback between receiving the request and monitoring the results of the damage management strategy. The Decision Model is not a written documented process, but a mental problem-solving process common to most, if not all, professions, including WS.

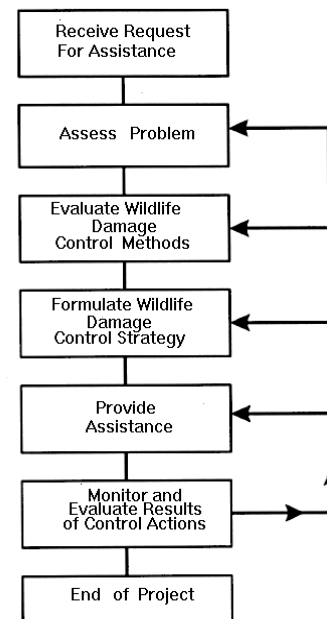


Figure 3.1 WS Decision Model as presented by Slate et al. (1992) for developing a strategy to respond to a request for assistance with human-wildlife conflicts.

Community-based Decision Making

WS would receive requests for assistance from community leaders and/or representatives. In those situations, WS would follow the “*co-managerial approach*” to solve wildlife damage or conflicts as described by Decker and Chase (1997). Wildlife Services and other state and federal wildlife management agencies may facilitate discussions at local community meetings when resources were available. Under this approach, resource owners and others directly affected by white-tailed deer damage or conflicts would have direct input into the resolution of such problems. They may implement management recommendations provided by WS or others, or may request direct operational assistance from WS, other wildlife management agencies, local animal control agencies, or private businesses or organizations.

Under a community-based decision-making process, WS would provide information, demonstration, and discussion on available methods to the appropriate representatives of the community for which services were requested to ensure a community-based decision was made. By involving decision-makers in the process, damage management actions would be presented to allow decisions on damage management to involve those individuals that the decision-maker(s) represents. Wildlife Services would provide technical assistance to the appropriate decision-maker(s) to allow for information on damage management activities to be presented to those persons represented by the decision-maker(s), including demonstrations and presentation by WS at public meetings to allow for involvement of the community. Requests for assistance to manage damage caused by white-tailed deer often originate from the decision-maker(s) based on community feedback or from concerns about damage or threats to human safety. As representatives of the community, the decision-maker(s) would be able to provide the information to local interests either through technical assistance provided by WS or through demonstrations and presentation by WS on damage management activities. This process would allow decisions on damage management activities to be made based on local input. Local community leaders would then make a decision on deer damage management actions to be implemented and inform community members.

3.1.2 Alternative 2 –White-tailed deer Damage Management by WS through Technical Assistance Only

Under this alternative, WS would provide those cooperators requesting assistance with technical assistance only. Similar to Alternative 1, WS would receive requests for assistance from community representatives, private individuals/businesses, or from public entities. Technical assistance would provide those cooperators experiencing damage or threats associated with white-tailed deer with information, demonstrations, and recommendations on available and appropriate methods. The implementation of methods and techniques to resolve or prevent damage would be the responsibility of the requester with no direct involvement by WS. In some cases, WS may provide supplies or materials that were of limited availability for use by private entities (*e.g.*, loaning of propane cannons). Technical assistance may be provided through a personal or telephone consultation, or during an on-site visit with the requester. Generally, several management strategies would be described to the requester for short and long-term solutions to managing damage; those strategies would be based on the level of risk, need, and the practicality of their application. Wildlife Services would use the Decision Model to recommend those methods and techniques available to the requester to manage damage and threats of damage. Those persons receiving technical assistance from WS would implement those methods recommended by WS, would employ other methods not recommended by WS, would seek assistance from other entities, or take no further action. As in Alternative 1, WS would continue to educate the public on wildlife damage management, and utilize the NWRC to develop methods for wildlife damage management.

Under a technical assistance only alternative, WS would recommend an integrated approach similar to the proposed action alternative (Alternative 1) when receiving a request for assistance; however, WS would not provide direct operational assistance under this alternative. Recommendation of methods and techniques by WS to resolve damage would be based on information provided by the individual seeking assistance using the WS Decision Model. In some instances, wildlife-related information provided to the requestor by WS would result in tolerance/acceptance of the situation. In other instances, damage management options would be discussed and recommended. Only those methods legally available for use by the appropriate individual would be recommend or loaned by WS. Similar to Alternative 1, those methods described in Appendix B would be available to those persons experiencing damage or threats associated with white-tailed deer except for immobilizing drugs, euthanasia chemicals, and reproductive inhibitors. Immobilizing drugs and euthanasia chemicals would only be available to WS or appropriately licensed veterinarians. Under this alternative, the reproductive inhibitor available under the trade name of GonaCon™ would only be available for use by the NYSDEC or those persons under the supervision of the NYSDEC. At the time this EA was developed, GonaCon™ was not registered for use in the state.

WS regularly provides technical assistance to individuals, organizations, and other federal, state, and local government agencies for managing white-tailed deer damage. Technical assistance would include collecting information about the species involved, the nature and extent of the damage, and previous methods that the cooperator had attempted to resolve the problem. Wildlife Services would then provide information on appropriate methods that the cooperator would consider to resolve the damage themselves. Types of technical assistance projects may include a visit to the affected property, written communication, telephone conversations, or presentations to groups such as homeowner associations or civic leagues. Between FY 2009 and FY 2013, WS has conducted 22 technical assistance projects that involved deer damage to agricultural resources, property, natural resources, and threats to human safety.

This alternative would place the immediate burden of operational damage management work on the resource owner, other governmental agencies, and/or private businesses. Those persons experiencing damage or were concerned with threats posed by white-tailed deer would seek assistance from other governmental agencies, private entities, or conduct damage management on their own. Those persons experiencing damage or threats would take action using those methods legally available to resolve or prevent white-tailed deer damage as permitted by federal, state, and local laws and regulations or those persons would take no action.

3.1.3 Alternative 3 – No White-tailed Deer Damage Management Conducted by WS

This alternative would preclude all activities by WS to reduce threats to human health and safety, and to alleviate damage to agricultural resources, property, and natural resources. Wildlife Services would not be involved with any aspect of white-tailed deer damage management. All requests for assistance received by WS to resolve damage caused by white-tailed deer would be referred to the NYSDEC, other governmental agencies, and/or private entities.

Despite no involvement by WS in resolving damage and threats associated with white-tailed deer, those persons experiencing damage caused by white-tailed deer would continue to resolve damage by employing those methods legally available since the harvest of white-tailed deer can occur despite the lack of involvement by WS. The

harvest of white-tailed deer by other entities would occur through the issuance of permits by the NYSDEC, when required, and during the hunting seasons. All methods described in Appendix B would be available for use by those persons experiencing damage or threats under this alternative, except for the use of GonaCon™, immobilizing drugs, and euthanasia chemicals. GonaCon™ would only be used by WS and the NYSDEC. Immobilizing drugs and euthanasia chemicals would only be used by WS or appropriately licensed veterinarians.

Under this alternative, those persons experiencing damage or threats of damage would contact WS; however, WS would immediately refer the requester to the NYSDEC and/or other entities. The requester would contact other entities for information and assistance with managing damage, would take actions to alleviate damage without contacting any entity, or would take further no action.

3.2 ALTERNATIVES CONSIDERED BUT NOT ANALYZED IN DETAIL WITH RATIONALE

In addition to those alternatives analyzed in detail, several additional alternatives were identified by WS. However, those alternatives will not receive detailed analyses for the reasons provided. Those alternatives considered but not analyzed in detail include:

3.2.1 Non-lethal Methods Implemented Before Lethal Methods

This alternative would require that non-lethal methods or techniques described in Appendix B be applied to all requests for assistance to reduce damage and threats to safety from white-tailed deer. If the use of non-lethal methods fails to resolve the damage situation or reduce threats to human safety at each damage situation, lethal methods would be employed to resolve the request. Non-lethal methods would be applied to every request for assistance regardless of severity or intensity of the damage or threat until deemed inadequate to resolve the request. This alternative would not prevent the use of lethal methods by other entities or by those persons experiencing white-tailed deer damage but would only prevent the use of those methods by WS until non-lethal methods had been employed.

Those persons experiencing damage often employ non-lethal methods to reduce damage or threats prior to contacting WS. Verification of the methods used would be the responsibility of WS. No standard exists to determine requester diligence in applying those methods, nor are there any standards to determine how many non-lethal applications are necessary before the initiation of lethal methods. Thus, only the presence or absence of non-lethal methods can be evaluated. The proposed action (Alternative 1) and the technical assistance only alternative (Alternative 2) are similar to a non-lethal before lethal alternative because WS would use or recommend non-lethal methods before lethal methods (WS Directive 2.101). Adding a non-lethal before lethal alternative and the associated analysis would not contribute additional information to the analyses in the EA.

The purpose of the EA is to resolve deer damage and threats to airports, private property, agricultural resources, natural resources, and human health and safety. Requiring a landowner or manager to implement non-lethal methods before lethal methods may not resolve the deer damage. Moreover, the state has management authority over deer and would make determinations based on state law and regulations about requirements landowners and managers must abide to manage deer.

3.2.2 Use of Non-lethal Methods Only by WS

Under this alternative, WS would be required to implement non-lethal methods only to resolve damage caused by white-tailed deer. Only those methods discussed in Appendix B that were considered non-lethal would be employed by WS. No intentional harvest of white-tailed deer would occur by WS. The use of lethal methods would continue to be used under this alternative by other entities or by those persons experiencing damage by white-tailed deer. The non-lethal methods used or recommended by WS under this alternative would be identical to those non-lethal methods identified in any of the alternatives.

In situations where non-lethal methods were impractical or ineffective to alleviate damages, WS would refer requests for information regarding lethal methods to the NYSDEC, local animal control agencies, or private businesses or organizations. Property owners or managers would conduct management using any method that was legal. Property owners or managers might choose to implement WS' non-lethal recommendations, implement lethal methods, or request assistance from a private or public entity other than WS. Property owners/managers frustrated by the lack of WS' assistance with the full range of white-tailed deer damage management techniques may try methods not recommended by WS or use illegal methods (*e.g.*, poisons). In some cases, property owners or managers may misuse some methods or use some methods in excess of what was necessary, which would then become hazardous and pose threats to the safety of people and non-target species.

The proposed action, using an integrated damage management approach, incorporates the use of non-lethal methods when addressing requests for assistance. In those instances where non-lethal methods would effectively resolve damage from white-tailed deer, those methods would be used or recommended under the proposed action. Since non-lethal methods would be available for use under the alternatives analyzed in detail, this alternative would not add to the analyses.

The purpose of the EA is to resolve deer damage to various resources. Requiring a landowner or manager to implement non-lethal methods may not resolve the deer damage. However, where appropriate Wildlife Services would recommend the use of non-lethal methods to alleviate deer damage where success is likely. Moreover, the state has management authority over deer and would make determinations based on state law and regulations about requirements landowners and managers must abide to manage deer.

3.2.3 Use of Lethal Methods Only by WS

This alternative would require the use of lethal methods only to reduce threats and damage associated with white-tailed deer. However, non-lethal methods can be effective in preventing damage in certain instances. Under WS Directive 2.101, WS must consider the use of non-lethal methods before lethal methods. Non-lethal methods have been effective in alleviating white-tailed deer damage. For example, the use of ornamental plantings sustain less browsing damage than other varieties of ornamental plantings (*e.g.*, marigold flowers versus pansies) can be effective at reducing deer damage to ornamental plants. In those situations where damage would be alleviated using non-lethal methods deemed effective, those methods would be employed or recommended as determined by the WS Decision Model.

The purpose of the EA is to resolve deer damage to various resources. Requiring a landowner or manager to implement lethal methods only may be unnecessary to resolve the deer damage in certain situations. Moreover,

the state has management authority over deer and would make determinations based on state law and regulations about requirements landowners and managers must abide to manage deer. Therefore, this alternative was not considered in detail.

3.2.4 Capture and Translocate White-tailed Deer Only

Under this alternative, all requests for assistance would be addressed using live-capture methods or the recommendation of live-capture methods. White-tailed deer would be live-captured using live capture devices including, but not limited to, immobilizing drugs, drive nets, cannon nets, rocket nets, or other methods approved by the NYSDEC. All white-tailed deer live-captured through direct operational assistance by WS would be translocated. Translocation sites would be identified and have to be approved by the NYSDEC and/or the property owner where the translocated white-tailed deer would be placed prior to live-capture and translocation. Live-capture and translocation would be conducted as part of the alternatives analyzed in detail. However, the translocation of white-tailed deer would only occur under the authority of the NYSDEC as part of a deer reintroduction or restoration effort. When requested by the NYSDEC, WS would translocate white-tailed deer or recommend translocation under any of the alternatives analyzed in detail, except under the no involvement by WS alternative (Alternative 3). In addition, translocation of white-tailed deer by WS would occur only under Alternative 1. However, translocation by other entities would occur under Alternative 3.

The translocation of white-tailed deer to other areas following live-capture generally is not cost-effective (Beringer et. al 2002). Translocation is generally ineffective because problem white-tailed deer are highly mobile and can easily return to damage sites from long distances, habitats in other areas are generally already occupied, and translocation would most likely result in white-tailed deer damage problems at the new location. In addition, hundreds of white-tailed deer would need to be captured and translocated to solve some damage problems (*e.g.*, deer confined within a perimeter fence); therefore, translocation would be unrealistic. Translocation of wildlife is also discouraged by WS policy (see WS Directive 2.501) because of the stress to the translocated animal, poor survival rates, threat of spreading diseases, and the difficulties that translocated wildlife have with adapting to new locations or habitats (Nielsen 1988).

The purpose of the EA is to resolve deer damage to various resources. Requiring a landowner or manager to translocate deer may have additional consequences to the deer and environment plus not resolve the damage. Moreover, the state has management authority over deer and would make determinations based on state law and regulations about requirements landowners and managers must abide to manage deer. Since WS does not have the authority to translocate white-tailed deer unless permitted by the NYSDEC, this alternative was not considered in detail.

3.2.5 Compensation for White-Tailed Deer Damage

The compensation alternative would require WS to establish a system to reimburse persons impacted by white-tailed deer damage and to seek funding for the program. Under such an alternative, WS would continue to provide technical assistance to those persons seeking assistance with managing damage. In addition, WS would conduct site visits to verify damage. Evaluation of this alternative indicates that a compensation only alternative has many drawbacks. Compensation would: 1) require large expenditures of money and labor to investigate and validate all damage claims, and to determine and administer appropriate compensation, 2) compensation most

likely would be below full market value, 3) give little incentive to resource owners to limit damage through improved cultural or other practices and management strategies, and 4) not be practical for reducing threats to human health and safety.

Wildlife Services is not funded by Congress to pay compensation for deer damage. The purpose of the EA is to resolve deer damage to various resources. Paying compensation for deer damage does not resolve the deer damage. Moreover, the state has management authority over deer and would make determinations based on state law and regulations about requirements landowners and managers must abide to manage deer, including compensation. Since there are several drawbacks to compensation, this alternative was not considered in detail.

3.2.6 Short Term Eradication and Long Term Population Suppression

An eradication alternative would direct all WS' program efforts toward total long-term elimination of deer populations wherever a cooperative program was initiated in New York. Eradication of native white-tailed deer is not a desired population management goal of state agencies or WS. Eradication as a general strategy for managing white-tailed deer damage was not considered in detail because state and federal agencies with interest in, or jurisdiction over, wildlife oppose eradication of any native wildlife species and eradication is not acceptable to most people. Since eradication and suppression are not desired population management goals, this alternative was not considered in detail.

Suppression would direct WS' program efforts toward managed reduction of certain problem populations or groups. In areas where damage can be attributed to localized populations of white-tailed deer, WS would decide to implement local population suppression using the WS' Decision Model. However, large-scale population suppression would not be realistic or practical to consider as the basis of the WS' program. Problems with the concept of suppression would be similar to those described above for eradication. Typically, WS' activities in New York would be conducted on a very small portion of the sites or areas inhabited or frequented by problem species.

The purpose of the EA is to resolve deer damage to various resources. The state has responsibility to balance the needs of its citizens regarding the aesthetic value and damage caused by deer. Eradication would fail to meet the needs of the state to balance the needs of its citizens. Moreover, the state has management authority over deer and would make determinations based on state law and regulations about requirements landowners and managers must abide to manage deer.

3.3 STANDARD OPERATING PROCEDURES FOR WHITE-TAILED DEER DAMAGE MANAGEMENT

SOPs improve the safety, selectivity, and efficacy of activities intended to resolve wildlife damage. Wildlife Services uses many such SOPs. Those SOPs would be incorporated into activities conducted by WS under the appropriate alternatives when addressing white-tailed deer damage and threats.

The SOPs pertinent to the relevant alternatives include the following:

- The WS Decision Model, which is designed to identify effective strategies to managing white-tailed deer damage and their potential impacts, would be consistently used and applied when addressing white-tailed deer damage.
- EPA-approved label directions would be followed for all pesticide use. The registration process for chemical pesticides is intended to assure minimal adverse effects occur to the environment when chemicals are used in accordance with label directions.
- Immobilizing and euthanasia drugs would be used according to the DEA, FDA, and WS' directives and procedures.
- All controlled substances would be registered EPA, DEA, FDA, and/or the NYSDEC Bureau of Pesticides Management, as appropriate.
- WS' employees would follow approved procedures outlined in the WS' Field Manual for the Operational Use of Immobilizing and Euthanizing Drugs (Johnson et al. 2009).
- WS' employees that use controlled substances would be trained to use each material and would be certified to use controlled substances.
- WS' employees who use pesticides and controlled substances would participate in state-approved continuing education to keep current of developments and maintain their certifications.
- Pesticide and controlled substance use, storage, and disposal would conform to label instructions and other applicable laws and regulations, and Executive Order 12898.
- Material Safety Data Sheets for pesticides and controlled substances would be provided to all WS' personnel involved with specific damage management activities.
- All personnel who use firearms would be trained according to WS' Directives.
- The use of non-lethal methods would be considered prior to the use of lethal methods when managing deer damage.
- The harvest of white-tailed deer by WS under the proposed action alternative would only occur when authorized and only at levels authorized.
- Management actions would be directed toward localized populations, individuals, or groups of target species. Generalized population suppression across New York, or even across major portions of New York, would not be conducted.

3.4 ADDITIONAL STANDARD OPERATING PROCEDURES SPECIFIC TO THE ISSUES

Several additional SOPs are applicable to the alternatives and the issues identified in Chapter 2 including the following:

3.4.1 Issue 1 - Effects of Damage Management Activities on White-tailed Deer Populations

Harvest of white-tailed deer by WS would be reported and monitored by WS and the NYSDEC to evaluate population trends and the magnitude of WS' harvest of white-tailed deer.

WS would only target those individuals or groups of target species identified as causing damage or posing a threat to human safety.

Preference would be given to non-lethal methods, when practical and effective.

3.4.2 Issue 2 - Effects on Non-target Plant and Wildlife Species Populations, Including T&E Species

When conducting removal operations via shooting, identification of the target would occur prior to application.

As appropriate, suppressed firearms would be used to minimize noise impacts.

Personnel would use lures, drop net placements, and capture devices that would be strategically placed at locations likely to capture a target animal and minimize the potential of non-target animal captures.

Any non-target animals captured in nets or any other restraining device would be released whenever it is possible and safe to do so.

Personnel would be present during the use of live-capture methods or would operate in accordance with New York laws and regulations. This would help ensure non-target species were released in a timely manner or were prevented from being captured.

Carcasses of white-tailed deer retrieved after damage management activities have been conducted would be disposed of in accordance with WS Directive 2.515.

WS has consulted with the USFWS and the NYSDEC to evaluate activities to resolve deer damage and threats to ensure the protection of T&E species.

WS would monitor activities conducted under the selected alternative, if activities are determined to have no significant impact on the environment and an EIS is not required, to ensure those activities do not negatively impact non-target species.

3.4.3 Issue 3 - Effects of Damage Management Methods on Human Health and Safety

Damage management activities would be conducted professionally and in the safest manner possible. Whenever possible, damage management activities would be conducted away from areas of high human activity. If this were not possible, then activities would be conducted during periods when human activity is low (*e.g.*, at night).

Shooting would be conducted during times when public activity and access to the control areas were restricted. Personnel involved in shooting operations would be fully trained in the proper and safe application of this method.

All personnel employing chemical methods would be properly trained and certified in the use of those chemicals. All chemicals used by WS would be securely stored and properly monitored to ensure the safety of the public. Wildlife Services' use of chemicals and training requirements to use those chemicals are outlined in WS Directive 2.401 and WS Directive 2.430, "Controlled Chemical Immobilization and Euthanasia Agents".

WS would adhere to all established withdrawal times for white-tailed deer when using immobilizing drugs for the capture of white-tailed deer that are agreed upon by WS, the NYSDEC, and veterinarian authorities. Although unlikely, in the event that WS was requested to immobilize white-tailed deer either during a time when harvest of deer was not occurring or during a time where the withdrawal period would overlap with the start of a harvest season, WS would euthanize the animal or mark the animal with a tag labeled with a "*do not eat*" warning and appropriate contact information.

3.4.4 Issue 4 - Effects on the Socio-cultural Elements of the Human Environment

Management actions to reduce or prevent damage caused by white-tailed deer would be directed toward specific individuals identified as responsible for the damage, identified as posing a threat to human safety, or identified as posing a threat of damage.

All methods or techniques applied to resolve damage or threats to human safety would be agreed upon by entering into a cooperative service agreement, MOU, or comparable document prior to the implementation of those methods.

Preference would be given to non-lethal methods, when practical and effective.

3.4.5 Issue 5 - Humaneness and Animal Welfare Concerns of Methods

Personnel would be well trained in the latest and most humane devices/methods for removing target white-tailed deer causing damage.

When deemed appropriate using the WS' Decision Model, WS' use of lethal methods would comply with WS' directives (WS Directive 2.505, "Wildlife Euthanasia" WS Directive 2.430, "Controlled Chemical Immobilization and Euthanasia Agents").

The NWRC is continually conducting research to improve the selectivity and humaneness of wildlife damage management devices used by personnel in the field.

3.4.6 Issue 6 - Effects of White-tailed Deer Damage Management Activities on the Regulated Harvest of White-tailed deer

Management actions to reduce or prevent damage caused by white-tailed deer would be directed toward specific individuals identified as responsible for the damage, identified as posing a threat to human safety, or identified as posing a threat of damage.

WS' activities to manage damage and threats caused by white-tailed deer would be coordinated with the NYSDEC.

WS' harvest of white-tailed deer would be reported to and monitored by the NYSDEC to ensure WS' harvest has been considered as part of management objectives for white-tailed deer.

NYSDEC would monitor activities to ensure those activities do not adversely affect deer populations.

CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

Chapter 4 provides information needed for making informed decisions in selecting the appropriate alternative to address the need for action described in Chapter 1 and the issues described in Chapter 2. This chapter analyzes the potential significant environmental consequences of each alternative as that alternative relates to the issues identified. The following resource values in the state are not expected to be significantly impacted by any of the alternatives analyzed as none of the alternatives cause any significant ground disturbance: soils, geology, minerals, water quality/quantity, flood plains, critical habitats (areas listed in T&E species recovery plans), visual resources, air quality, prime and unique farmlands, aquatic resources, timber, and range. Therefore, these resources will not be analyzed.

Direct impacts are caused by the action and occur at the same time and place.

Indirect impacts are caused by the action and are later in time or farther removed in distance. Indirect impacts may include effects related to induced changes in population density, ecosystems, and land use changes.

Cumulative impacts, as defined by CEQ (40 CFR 1508.7), are impacts to the environment that result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts may result from individually minor, but collectively significant, actions taking place over time

WS does not normally conduct direct damage management activities concurrently with other federal, state, or private entities in the same area, but may conduct damage management activities at adjacent sites within the same period. In addition, commercial companies may conduct damage management activities in the same area. The potential cumulative impacts analyzed below would occur from either WS' damage management program activities over time or from the aggregate effects of those activities combined with the activities of other agencies and private entities. Through ongoing coordination and collaboration between WS and the NYSDEC, activities of each agency and the harvest of white-tailed deer would be available. Damage management activities in the state would be monitored to evaluate and analyze activities to ensure they were within the scope of analysis of this EA.

4.1 ENVIRONMENTAL CONSEQUENCES FOR ISSUES ANALYZED IN DETAIL

This section analyzes the environmental consequences of each alternative in comparison to determine the extent of actual or potential impacts on the issues. Therefore, the proposed action/no action alternative (Alternative 1) serves as the baseline for the analysis and the comparison of expected impacts among the alternatives. The analysis also takes into consideration mandates, directives, and the procedures of WS and the NYSDEC.

4.1.1 Issue 1 - Effects of Damage Management Activities on White-tailed deer Populations

A common issue is whether damage management actions would adversely affect the populations of white-tailed deer species, especially when lethal methods were employed. Wildlife Services would maintain ongoing contact with and submit annual activity reports to the NYSDEC to ensure activities occurred within management objectives for those species. Ongoing contact with the NYSDEC would assure local, state, and regional knowledge of wildlife population trends would be considered.

The issue of the potential impacts of conducting the alternatives on the populations of white-tailed deer is analyzed for each alternative below.

Alternative 1 - Continue the Current White-tailed Deer Damage Management Program (No Action/Proposed Action)

Under the proposed action, WS would continue to provide both technical assistance and direct operational assistance to those persons requesting assistance with managing damage and threats associated with white-tailed deer. Wildlife Services would employ those methods described in Appendix B in an adaptive approach that would integrate methods to effectively reduce damage and threats associated with white-tailed deer.

White-tailed Deer Population Information and Effects Analysis

The white-tailed deer reproductive season varies according to geographic range. It may occur by the first two weeks in November in the north, but occurs as late as January or February in the south. Females, called “does”, may have one to three young, or “fawns”, after a gestation period of approximately 202 days (Craven and Hygnstrom 1994). Most does have two fawns each year and in some favorable circumstances triplets are possible as well as a small percentage of yearlings may be bred (Haugen 1975, Dapson et al. 1979).

Some people believe that if you lethally remove deer, more deer will immigrate into the area and/or the local population will grow larger than the original population. However, deer are territorial species that infrequently move long distances to inhabit new locations, and research has shown that even in areas with high densities of deer, emigration rarely occurs (Hygnstrom et al. 2011). Additionally, deer populations are limited in their population growth response by some density dependent functions that are influenced by environmental effects (i.e., density independent functions) (DeYoung 2011). Density dependent and independent effects are not competing models but have complex interactions over time (DeYoung 2011, Kie et al. 2003). At times, all populations are density dependent while at other times they are density independent (McCullough 1992, DeYoung et al. 2008). Deer populations in good physical condition (e.g., below carrying capacity) and with access to ample food sources may not demonstrate density dependent responses. This concept is important because some people believe populations are entirely density independent and can keep growing with no harmful effects on the population or environment. If a local deer herd is at carrying capacity, it is a miserable place to be due to nutritional stress, high mortality, low fecundity and population growth near zero (DeYoung 2011). In summary, wildlife managers need to be cognizant of density dependent functions on deer populations when making deer management decisions.

White-tailed deer are present statewide in New York, and deer densities are sufficient to allow deer to be harvested during annual hunting seasons. The primary tool for the management of deer populations is through adjusting the allowed legal harvest during the deer harvest season. Mortality can also occur from vehicle collisions, predation (e.g., coyotes, dogs, bobcats), illegal harvest, tangling in fences, disease, parasites, malnutrition, poaching, and harsh weather. Annual deer mortality in New York from other sources (e.g., illegal harvest, disease, and predation) is currently unknown. In 2011, a spokesperson from the Transportation Department estimated 35,000 deer-vehicle collisions occurred in New York (Meece 2013), and an unknown percent of these deer died.

Permits Relating to Deer Damage Management

NYSDEC Deer Management Assistance Program (DMAP) helps landowners and resource managers implement site specific deer management on their lands. DMAP permits are valid during the open deer hunting season and can only be used by licensed hunters. Only antlerless deer may be harvested with these permits. The criteria to be eligible for a DMAP permit are as follows:

- An applicant must own or control land where agricultural damage has been documented
- A municipality has documented a deer problem
- There is documented damage to significant natural communities
- Land total 100 or more acres where forest regeneration is negatively impacted by deer
- Quality Deer Management (QDM) is taking place on 1,000 or more acres

These criteria help control target populations of deer and reduce agricultural and plant community damage. DMAP permits in prior years were made available to those experiencing damage to agriculture, forest regeneration, custom deer management programs significant natural communities, and municipal governments. Totals for each year are shown in Table 4.1.

Table 4.1 Deer Management Assistance Program (DMAP) New York Statewide summary 2001-2014¹.

<u>Year</u>	<u>DMAP Permits Issued</u>	<u>Kill Tags Issued under DMAP Permit</u>	<u>Reported Harvest</u>
2001	1,783	21,972	11,460
2002	2,200	25,591	12,504
2003	2,344	27,940	12,164
2004	2,426	28,057	9,371
2005	2,476	27,628	9,967
2006	2,420	25,783	9,989
2007	2,449	25,048	10,136
2008	2,490	25,215	10,010
2009	2,616	26,275	9,789
2010	2,364	21,957	12,384
2011	2,312	21,720	10,767
2012	2,231	20,927	10,497
2013	2,345	22,661	12,285
2014	2,190	21,222	12,627

¹Taken from the New York State White-tailed Deer Harvest Summary (NYSDEC 2012, 2013, and 2014c).

Deer Damage Permits (DDPs) assist landowners and agricultural producers to reduce damage on individual properties and can be issued while the damage is occurring (Table 4.2). These permits are issued by NYSDEC to applicants for a limited number of deer on specific land. All deer harvested under a DDP must be reported to the NYSDEC. The permittee and approved agents only can harvest antlerless deer committing property damage outside of the open deer hunting season. Permits may be issued to protect a variety of resources (Table 4.3).

Table 4.2 Deer Damage Permit (DDP) New York statewide summary 2001-2014¹.

<u>Year</u>	<u>DDPs Issued</u>	<u>Reported Harvest</u>
2001	1,430	4,505
2002	1,464	4,410
2003	1,533	4,051
2004	1,544	4,866
2005	1,456	4,428
2006	1,249	2,735
2007	1,143	3,708
2008	1,239	4,070
2009	1,358	4,468
2010	1,337	4,445
2011	1,481	5,007
2012	1,544	5,046
2013	1,640	5,104
2014	1,684	6,076

¹Taken from the New York State White-tailed Deer Harvest Summary (NYSDEC 2012, 2013, and 2014c).

Table 4.3 Deer Damage Permits issued in New York by resource category during calendar year 2012-2014¹.

<u>Category²</u>	<u>2012</u>	<u>2013</u>	<u>2014</u>
Airport	39	41	42
Agriculture	1,777	2,054	2,114
Tree Farm/Orchard	472	548	506
Community/Residential	288	248	273
Ecological	23	41	51
Other	1	22	1

¹Taken from the New York State White-tailed Deer Harvest Summary (NYSDEC 2012, 2013, and 2014c).

²Permits may be issued for more than one category of damage; sum of permit categories may not equal the total.

NYSDEC also provides Deer Management Permits (DMPs) to manage deer across large geographic areas. These are available to licensed hunters and can be used in all Southern Zone and a few Northern Zone Wildlife Management Units, allow the harvest of antlerless deer only, and are valid for a specific Wildlife Management Unit during all hunting seasons. Hunters may apply for up to two DMPs depending on geographic availability, if there are permits remaining after the initial application period end, the remaining DMP may be available for an extended application period.

The issue of the effects on target white-tailed deer species arises from the use of non-lethal and lethal methods to address the need for reducing damage and threats. Non-lethal methods would be used to exclude, harass, and

disperse target wildlife from areas where damage or threats were occurring. Non-lethal methods can have the direct effect of dispersing or otherwise making an area unattractive to white-tailed deer; thereby, reducing the presence of white-tailed deer at the site and potentially the immediate area around the site where non-lethal methods were employed. Non-lethal methods would be given priority when addressing requests for assistance (see WS Directive 2.101). However, non-lethal methods would not necessarily be employed to resolve every request for assistance if deemed inappropriate by WS' personnel using the WS Decision Model. For example, if a cooperators requesting assistance, had already attempted to disperse white-tailed deer using non-lethal harassment methods, WS would not necessarily employ those methods again during direct operational assistance since those methods had already been proven to be ineffective in that particular situation. However, white-tailed deer responsible for causing damage or threats would be moved to other areas with minimal impacts occurring to those species' populations. Non-lethal methods would not be employed over large geographical areas or applied at such intensity that essential resources (*e.g.*, food sources, habitat) would be unavailable for extended durations or over a wide geographical scope that long-term adverse effects would occur to a species' population. Non-lethal methods would generally be regarded as having minimal direct impacts on overall populations of white-tailed deer since individuals of those species would be unharmed. The use of non-lethal methods would have no indirect effects on white-tailed deer, and would not have cumulative effects on white-tailed deer populations in the state.

Lethal methods would be employed to resolve damage associated with those white-tailed deer identified by WS as responsible for causing damage or threats to human safety only after receiving a request and only after a permit had been issued for the harvest of the species by the NYSDEC. Therefore, the use of lethal methods would result in directly impacting local populations in the area where damage or threats were occurring since target individuals would be removed from the population. Lethal methods would be employed to reinforce non-lethal methods and to remove white-tailed deer that have been identified as causing damage or posing a threat to human safety.

The number of white-tailed deer removed from a population using lethal methods under the proposed action would be dependent on the number of requests for assistance received, the number of white-tailed deer involved with the associated damage or threat, and the efficacy of methods employed. Wildlife Services would maintain ongoing contact with the NYSDEC to ensure activities were within management objectives for those species. Wildlife Services would submit annual damage management activity reports to the NYSDEC. The NYSDEC would monitor the total harvest of white-tailed deer from all sources and would factor in survival rates from predation, disease, and other mortality data to assure that there would be no negative cumulative impacts to the state deer population.

Harvest data from all sources over the last five years amounted to approximately 25% of the statewide deer population. WS considers this harvest level to be of a low magnitude because the estimated deer population remained stable over the five year time span. The level of harvest by WS that occurred in FY 2014 was 433 deer and represented 0.177% of the total known harvest of deer in the state. When compared to the 2014 New York state-wide deer population estimate, WS' harvest represented 0.042% of the estimated population. The cumulative impact on the deer population by WS was negligible and therefore considered to be of extremely low magnitude (Table 4.4).

Table 4.4 Comparison of Wildlife Services’ harvest of deer with harvest from all other known sources in New York from 2009 – 2014.

	<u>2009</u>	<u>2010</u>	<u>2011</u>	<u>2012</u>	<u>2013</u>	<u>2014</u>
Estimated Deer Population¹	850,000	920,000	920,000	1,050,000	960,000	1,030,000
Total NYSDEC Regulated Harvest²	222,798	230,100	228,359	242,957	243,567	238,672
DDP Harvest	4,468	4,445	5,007	5,046	5,104	6,076
Harvest by WS³	41	85	21	28	43	433
Total Deer Harvest⁴	227,307	234,630	233,387	248,031	248,714	245,181
WS % Harvest of Total	0.018	0.036	0.009	0.011	0.017	0.177
WS % Harvest of Population	0.004	0.009	0.002	0.003	0.004	0.042

¹Deer population estimate provided by the NYSDEC (Jeremy Hurst pers. comm. 2015).

²Total harvest of deer authorized by NYSDEC hunting seasons and under DMP and DMAP.

³Harvest by WS is reported by Fiscal Year.

⁴Includes total NYSDEC regulated hunting, deer damage permit, and WS harvest.

An increasing number of requests for assistance would likely result in the escalated use of lethal and non-lethal methods to resolve damage and threats associated with deer as permitted by the NYSDEC. After review of previous activities conducted by WS and in anticipation of additional efforts to manage damage, WS anticipates that future harvest would not exceed 3,500 deer annually in New York State. In addition, WS may be requested by the NYSDEC and/or the NYS Department of Agriculture and Markets to assist with sampling and managing the spread of diseases found in free-ranging and/or captive deer populations. In the case of a disease outbreak, WS could harvest up to 2,500 additional white-deer (this includes exotic ungulates in captive facilities) for sampling and/or to prevent further spread of diseases. Therefore, WS’ total annual harvest would not exceed 6,000 deer annually under the proposed action. The removal of 6,000 deer will be used in the analysis of WS’ activities even though the typical annual WS removal will likely not exceed 3,500 deer. Any harvest of deer by WS in New York must be authorized and permitted by the NYSDEC.

If requested, WS would assist with sampling and removing deer from captive facilities where deer are confined inside a perimeter fence. The detection of a disease at a captive facility often raises concerns of the potential spread of diseases to free-ranging herds. The spread of diseases among deer inside these facilities is often increased due to their close contact with one another. Often, once a disease is detected in a confined deer herd, the entire herd is destroyed to ensure the containment of the disease. Any involvement with the depopulation of deer confined inside a perimeter fence by WS would be at the request of the NYSDEC and the NYS Department of Agriculture and Markets.

Direct, Indirect, and Cumulative Impacts:

The magnitude of WS’ activities to alleviate damage and threats associated with deer would be low, with the oversight and permitting of WS’ activities occurring by the NYSDEC. If harvest by WS reached 6,000 deer, WS’ harvest would have represented 2.44% of the statewide hunter harvest plus deer damage permit harvest during 2014. Based on a statewide deer population estimated at 1,030,000 deer, harvest of up to 6,000 deer by WS would have represented 0.58% of the estimated population. However, as stated previously, WS’ annual harvest would likely be less than 3,500 deer with additional harvest for disease monitoring reaching 2,500 only when WS was requested to remove deer for this purpose. Domestic deer, confined within enclosed facilities, are not

included in statewide deer population estimates or included in statewide harvest estimates; therefore, the potential harvest by WS under this alternative would actually represent a lower magnitude of the statewide population and annual harvest levels. Wildlife Services would report harvest to the NYSDEC and monitor harvest to ensure activities did not adversely affect the statewide deer population. The permitting of deer harvest by the NYSDEC would be to the landowner or agency (not WS) who would request assistance from WS. Wildlife Services would follow the conditions of the permit and this would ensure harvest would meet the objectives of the *Management Plan for White-tailed Deer in New York State, 2012-2016*.

Other direct impacts include the reduction of local property damage, agriculture damage, and a local reduction in risk to human health and safety. In theory, if the population is density limited, overtime local deer populations would become less dense leading to indirect impacts of an increase in deer herd health. Deer herd health will be defined as higher fawn productivity per doe, an increase in fawn survival rates, lower number of parasites, lower risk for disease, and greater fat reserves within individual animals of the herd during fall and winter months (McCullough 1979, Eve 1981, Sams et al. 1996, Keyser et al. 2005, Ueno et al. 2010).

In addition to WS' intentional harvest of deer to resolve or prevent damage, WS also conducts other damage management activities that pose a risk for the unintentional harvest of deer. The harvest of deer by WS during other activities would not be expected to increase to any appreciable extent. The unintentional harvest of deer by WS would continue to be nominal when compared to the number of deer harvested annually. All harvest, including unintentional harvest, would be reported to the NYSDEC. Annual cumulative harvest would be evaluated by WS to ensure WS' harvest, whether intentional or unintentional, would not adversely affect deer populations in the state.

GonaCon™ was officially registered by the EPA in 2009 for use in reducing fertility in female white-tailed deer. According to the label, only WS or state wildlife management agency personnel or individuals working under their authority can use the reproductive inhibitor. Additionally, in order for GonaCon™ to be used in any given state, the product must also be registered with the state and approved for use by the appropriate state agency responsible for managing wildlife. The reproductive inhibitor GonaCon™ is currently not registered for use in New York. However, if GonaCon™ becomes available to manage deer in the state, the use of the inhibitor would be evaluated under the proposed action as a method available that would be used in an integrated approach to managing damage.

Population management from the use of reproductive inhibitors to induce a decline in a localized deer population occurs through a reduction in the recruitment of fawns into the population by limiting reproductive output of adults. A reduction in the population occurs when the number of deer being recruited into the population cannot replace those individuals that die from other causes each year, which equates to a net loss in the number of individuals in the population and a reduction in the overall population. Although not generally considered a lethal method since no direct harvest occurs, reproductive inhibitors can result in the reduction of a target species' population. Wildlife Services' use of GonaCon™ would target a local deer population identified as causing damage or threatening human safety. Although a reduction in a local deer population would likely occur from constant use of GonaCon™, the actual reduction in the local population annually would be difficult to derive prior to the initiation of the use of the vaccine.

One of the difficulties in calculating and analyzing any actual reduction that would occur from the use of the vaccine in a targeted population prior to application of the vaccine is the variability in the response of deer to the vaccine. Previous studies on GonaCon™ as a reproductive inhibitor have shown variability in the immune response of deer to the vaccine (Miller et al. 2000). Not all deer injected with GonaCon™ develop sufficient antibodies to neutralize the GnRH produced in the body. Those deer continue to enter into a reproductive state and produce fawns even after vaccination. The number of deer that do not develop sufficient antibodies after the initial vaccination cannot be predicted beforehand. In one study, 88% of the deer vaccinated with GonaCon™ did not produce fawns the following reproductive season while 12% of the deer injected with GonaCon™ produced fawns (Gionfriddo et al. 2009). The year following the initial vaccination, the number of deer that were vaccinated the first year that did not produce fawns declined to 47% while the number of deer producing fawns increased to 53% (Gionfriddo et al. 2009) demonstrating the diminishing results that are likely over time if deer are not provided a booster shot periodically.

Since the effects of GonaCon™ appear to be reversible if deer are not provided with a booster shot periodically, the reduction in a local population of deer from the use of GonaCon™ can be maintained at appropriate levels where damages or threats were resolved by increasing or decreasing the number of deer receiving booster injections. Although localized deer populations would likely be reduced from the use of GonaCon™, the extent of the reduction would be variable. For example, not all vaccinated deer would likely be prevented from entering into a reproductive state and those deer that were initially prevented from entering into a reproductive state often become reproductively active in subsequent years as the antibody levels neutralizing the GnRH hormone diminish over time. Therefore, the actual decline in the number of deer in a localized population achieved from the use of GonaCon™ would be difficult to predict prior to the use of the reproductive inhibitor. However, since the decline would occur through attrition over time and since the ability of the inhibitor to prevent reproduction diminishes with time, the actual decline in a localized population would be gradual and would be monitored. In addition, the reduction in a local deer population would be fully reversed if deer were no longer vaccinated or provided booster shots and other conditions (*e.g.*, food, disease) were favorable for population growth.

Turner et al. (1993) noted that although contraception in white-tailed deer may be used to limit population growth, it would not reduce the number of deer in excess of the desired level in many circumstances. Turner et al. (1993) further contended that initial population reductions by various other means may be necessary to achieve management goals, and that reproduction control would be one facet of an integrated program. Although immunocontraceptive technology has been effective in laboratories, pens, and in island field applications, it has not been effective in reducing populations of free-ranging white-tailed deer over large geographical areas.

Wildlife Disease Surveillance and Monitoring

The ability to efficiently conduct surveillance for and detect diseases is dependent upon rapid detection of the pathogen if it is introduced. Effective implementation of a surveillance system would facilitate planning and execution at regional and state levels, and coordination of surveillance data for risk assessment. It would also facilitate partnerships between public and private interests, including efforts by federal, state, and local governments as well as non-governmental organizations, universities, and other interest groups.⁶

⁶Data collected by organizations/agencies conducting research and monitoring will provide a broad species and geographic surveillance effort.

Under disease sampling strategies that would be implemented to detect or monitor diseases in the United States, WS' implementation of those sampling strategies would not adversely affect white-tailed deer populations in the state. Sampling strategies that would be employed involve sampling live-captured white-tailed deer that would be released on site after sampling occurs. The sampling (*e.g.*, drawing blood, tissue sample, fecal sample) and the subsequent release of live-captured white-tailed deer would not result in adverse effects since those white-tailed deer are released unharmed on site. In addition, sampling of sick, dying, or hunter harvested white-tailed deer would not result in the additive harvest of white-tailed deer that would not have already occurred in the absence of a disease sampling program. Therefore, the sampling of white-tailed deer for diseases would not adversely affect the populations of any of the white-tailed deer addressed in this EA nor would result in any harvest of white-tailed deer that would not have already occurred in the absence of disease sampling (*e.g.*, hunter harvest).

Summary

WS would monitor harvest by comparing numbers of animals killed with overall populations or trends in populations to assure the magnitude of harvest was maintained below the level that would cause undesired adverse effects to the viability of this native species population. WS' actions would be occurring simultaneously, over time, with other natural processes and human generated changes that are currently taking place. These activities include, but would not be limited to:

- Natural mortality of white-tailed deer
- Mortality through vehicle strikes, aircraft strikes, and illegal harvest
- Human induced mortality of white-tailed deer through private damage management activities
- Human induced mortality through regulated harvest
- Human and naturally induced alterations of wildlife habitat
- Annual and perennial cycles in population densities

All those factors play a role in the dynamics of white-tailed deer populations. In many circumstances, requests for assistance arise when some or all of those elements have contrived to elevate target species populations or place target species at a juncture to cause damage to resources. The actions taken to minimize or eliminate damage would be constrained as to scope, duration, and intensity for the purpose of minimizing or avoiding impacts to the environment. Wildlife Services uses the Decision Model to evaluate damage occurring, including other affected elements and the dynamics of the damaging species; to determine appropriate strategies to minimize effects on environmental elements; applies damage management actions; and subsequently monitors and adjusts/ceases damage management actions (Slate et al. 1992). This process allows WS to take into consideration other influences in the environment, such as those listed above, in order to avoid cumulative adverse impacts on target species. However, some positive cumulative impacts would occur over time, including improved herd health as local deer densities decrease and more food sources become available (McCullough 1979, Eve 1981, Sams et al. 1996, Keyser et al. 2005, Ueno et al. 2010).

With management authority over white-tailed deer populations, the NYSDEC would adjust harvest levels, including the harvest of WS, to ensure population objectives for white-tailed deer were achieved. Consultation and reporting of harvest by WS would ensure the NYSDEC considers any activities conducted by WS.

WS' harvest of white-tailed deer in New York from FY 2003 through FY 2014 was of a low magnitude when compared to the total known harvest of those species and the populations of those species. The NYSDEC considers all known harvest when determining population objectives for white-tailed deer and would adjust the number of white-tailed deer that would be harvested during the regulated harvest season and the number of white-tailed deer harvested for damage management purposes to achieve the population objectives. Any harvest by WS would occur at the discretion of the NYSDEC. Any white-tailed deer population declines or increases would be the collective objective for white-tailed deer populations established by the NYSDEC through the regulation of harvest. Therefore, the cumulative impact of white-tailed deer harvest annually or over time by WS would occur at the desire of the NYSDEC as part of management objectives for white-tailed deer. No significant cumulative adverse effects on target wildlife would be expected from WS' damage management activities.

Historical outcomes of WS' damage management activities on wildlife

Damage management activities associated with white-tailed deer would be conducted by WS only at the request of a cooperator to reduce damage that was occurring or to prevent damage from occurring and only after methods to be used were agreed upon by all parties involved. Wildlife Services would monitor activities to ensure any potential impacts were identified and addressed. Wildlife Services would work closely with state and federal resource agencies to ensure damage management activities would not adversely affect white-tailed deer populations and that WS' activities were considered as part of management goals established by those agencies. Historically, WS' activities to manage white-tailed deer in New York have not reached a magnitude that would cause adverse effects to white-tailed deer populations.

SOP built into the WS program

SOPs are designed to reduce the potential negative effects of WS' actions on white-tailed deer, and have been tailored to respond to changes in white-tailed deer populations that would result from unforeseen environmental changes. This would include those changes occurring from sources other than WS. Alterations in programs would be defined through SOPs, and implementation would be insured through monitoring, in accordance with the WS' Decision Model (see WS Directive 2.201; Slate et al. 1992).

Alternative 2 – White-tailed Deer Damage Management by WS through Technical Assistance Only

Under this alternative, WS would not be directly involved with damage management actions. Therefore, direct operational assistance would be provided by other entities, such as the NYSDEC, private entities, and/or municipal authorities. Therefore, operational deer damage management actions would go forward with or without WS' participation. WS would recommend and demonstrate for use both non-lethal and lethal methods legally available for use to resolve white-tailed deer damage. Methods and techniques recommended would be based on WS' Decision Model using information provided from the requestor or from a site visit. Requestors may implement WS' recommendations, implement other actions, seek assistance from other entities, or take no action. However, those people requesting assistance would likely be those persons that would implement damage abatement methods in the absence of WS' recommendations.

Direct, Indirect, and Cumulative Impacts:

White-tailed deer populations would not be directly impacted by WS from a program implementing technical assistance only. Under a technical assistance only alternative, those persons experiencing threats or damage associated with white-tailed deer would harvest white-tailed deer despite WS' lack of direct involvement in the management action. Harvest would continue to occur during the legal hunting season and would be done under the issuance of permits by the NYSDEC. Under this alternative, if the public follows WS' technical assistance advice, direct, indirect, and cumulative impacts would be similar to Alternative 1 but probably at a lower magnitude of harvest due to legal restrictions and expertise. If the public does not follow or is unable to follow WS' recommendations, the number of white-tailed deer harvested would likely be reduced, especially in urban and suburban environments where hunting is restricted. In this scenario, direct impacts would be variable and would include higher deer densities and a decrease in deer herd health. This may lead to a direct impact of an increase in local population levels and damage, and the potential for spillover onto adjacent properties. With an increase in herd size, indirect impacts over time include a potential decline in herd health (McCullough 1979, Eve 1981, Sams et al. 1996, Keyser et al. 2005, Ueno et al. 2010). Additionally, if the public does not follow or is unable to follow WS' advice, it is hypothetically possible that frustration caused by the inability to reduce damage and associated losses would lead to illegal harvest of white-tailed deer. In the past, people have resorted to the illegal use of chemicals and methods to resolve wildlife damage issues (White et al. 1989, USFWS 2001, FDA 2003). This would potentially lead to higher harvest levels than legally allowed which would result in direct impact of a lower deer population than the state intended. This may have the indirect impact of decreasing deer densities and increasing deer herd health; however herd size would be below state objectives. Cumulative impacts would be variable dependent on percentage of the population harvested.

Alternative 3 – No White-tailed Deer Damage Management Conducted by WS

Under this alternative, WS would not conduct damage management activities. Wildlife Services would have no direct involvement with any aspect of addressing damage caused by white-tailed deer and would provide no technical assistance. No harvest of white-tailed deer by WS would occur under this alternative. White-tailed deer would continue to be harvested to resolve damage and/or threats occurring through permits issued by the NYSDEC, during or outside the regulated hunting seasons. Management actions taken by non-federal entities would be considered the *environmental status quo*.

Direct, Indirect, and Cumulative Impacts:

Local white-tailed deer populations would likely experience similar effects to those laid out in alternative 2. Some resource/property owners may take illegal, unsafe, or environmentally harmful action against local populations of white-tailed deer out of frustration or ignorance. While WS would provide no assistance under this alternative, other individuals or entities would conduct lethal damage management resulting in harvest levels similar to or slightly lower than the proposed action.

Since white-tailed deer would still be harvested under this alternative, the potential direct, indirect, and cumulative impacts on the populations of white-tailed deer would be similar to alternative 2 for this issue. Wildlife Services' involvement would not be additive to harvest that would occur since the cooperator requesting WS' assistance would conduct white-tailed deer damage management activities without WS' direct involvement. Therefore, any actions to resolve damage or reduce threats associated with white-tailed deer would occur by other entities despite WS' lack of involvement under this alternative.

4.1.2 Issue 2 - Effects on Non-target Plant and Wildlife Species Populations, Including T&E Species

A concern is often raised about the potential impacts to non-target species, including T&E species, from the use of methods to resolve damage caused by white-tailed deer. The potential effects on the populations of non-target plant and wildlife species, including T&E species, are analyzed below.

Alternative 1 - Continue the Current White-tailed Deer Damage Management Program (No Action/Proposed Action)

The potential for adverse effects to non-targets occurs from the employment of methods to address white-tailed deer damage. Under the proposed action, WS would provide both technical assistance and direct operational assistance to those people requesting assistance.

WS personnel would be experienced with managing wildlife damage and would be trained in the employment of methods, which would allow WS' employees to use the WS Decision Model to select the most appropriate methods for taking targeted animals and excluding non-target species. To reduce the likelihood of capturing or taking non-target wildlife, WS would employ the most selective methods for the target species, would employ the use of attractants that were as specific to target species as possible, and determine placement of methods to avoid exposure to non-targets. SOPs to prevent and reduce any potential adverse impacts on non-targets are discussed in Chapter 3 of this EA. Despite the best efforts to minimize non-target exposure to methods during program activities, the potential for WS to disperse or harvest non-targets exists when applying both non-lethal and lethal methods to manage damage or reduce threats to safety.

Direct, Indirect, and Cumulative Impacts:

Non-lethal methods have the potential to cause direct impacts to non-targets primarily through exclusion, harassment, and dispersal. Any exclusionary device erected to prevent access of target species also potentially excludes wildlife species that were not the primary reason the exclusion was erected; therefore, non-target species excluded from areas may potentially be adversely impacted if the area excluded was large enough. Exclusionary methods can require constant maintenance to ensure effectiveness and therefore, the use of exclusionary devices would be somewhat limited to small, high-value areas. The use of auditory and visual dispersal methods to reduce damage or threats caused by white-tailed deer would also likely disperse non-targets in the immediate area the methods were employed. Therefore, non-targets may be dispersed from an area while employing non-lethal dispersal techniques. However, like target species, the potential impacts on non-target species would likely be temporary with target and non-target species often returning after the cessation of dispersal methods. Non-lethal methods would not be employed over large geographical areas and those methods would not be applied at such intensity levels that essential resources (*e.g.*, food sources, habitat) would be unavailable for extended durations or over a wide geographical scope that long-term indirect or cumulative impacts would occur to a species' population.

Aside from exclusionary devices or harassment, other non-lethal methods would be available for use under this alternative. Nets would be used in conjunction with other non-lethal methods such as sterilization. Nets restrain wildlife once captured; therefore, this method would be considered a live-capture method. Net placement in areas where target species were active and the use of target-specific attractants would likely minimize the capture of

non-targets. If nets were attended to appropriately, any non-targets captured would be released on site unharmed, and therefore should have no direct, indirect, or cumulative impacts.

Non-lethal chemical methods available for use under the proposed action would include repellents, reproductive inhibitors, and immobilizing drugs, which are described in Appendix B. Except for repellents that would be applied directly to the affected resource and reproductive inhibitors that would be applied directly to target animals, immobilizing drugs would be employed using baits that were highly attractive to target species and/or used in areas where exposure to non-targets would be minimal. The use of baits often requires an acclimation period and monitoring of potential non-target activity. All chemicals would be used according to product labels, which would ensure that proper use would minimize non-target threats. Wildlife Services' adherence to Directives and SOPs governing the use of chemicals would also ensure non-target hazards would be minimal. All chemical methods would be tracked and recorded to ensure proper accounting of used and unused chemicals occurs. All chemicals would be stored and transported according with WS' Directives and relevant federal, state, and local regulations.

Chemical repellents may be used or recommended by the WS program in New York to manage white-tailed deer damage. Wildlife Services may recommend or employ commercially available repellents when providing technical assistance and direct operational assistance. Only those repellents registered with the EPA pursuant to the FIFRA and registered with the NYSDEC would be recommended or used by WS under this alternative. The active ingredients in many commercially available repellents are naturally occurring substances (*e.g.*, capsaicin, whole egg solids). When used according to label instructions, most repellents would be regarded as safe (EPA 1992*a, b*). Therefore, the use and recommendation of repellents would have no negative impacts on non-target species when used according to label requirements. Most repellents for white-tailed deer pose a very low risk to non-targets when exposed to or when ingested. Characteristics of these chemicals and potential use patterns indicate that no direct, indirect, or cumulative impacts related to environmental fate would be expected from their use in WS' programs in New York when used according to label requirements.

Potential exposure of non-target wildlife to the reproductive inhibitor GonaCon™ would occur primarily from secondary hazards associated with wildlife consuming deer that have been injected with GonaCon™. Since GonaCon™ would be applied directly to deer through hand injection after the animal was live-captured and restrained, the risk of directly exposing non-target wildlife to GonaCon™ while being administered to deer would be nearly non-existent. Several factors inherent with GonaCon™ reduce risks to non-target wildlife from direct consumption of deer injected with the vaccine (EPA 2009). The vaccine itself and the antibodies produced by the deer in response to the vaccine are both proteins, which if consumed would be broken down by stomach acids and enzymes (EPA 2009, USDA 2010). The EPA determined that the potential risks to non-target wildlife from the vaccine and the antibodies produced by deer in response to the vaccine “...are not expected to exceed the Agency's concern levels” (EPA 2009).

Potential impacts to non-targets from the use of non-lethal methods would be similar to the use of non-lethal methods under any of the alternatives. Non-targets would generally be unharmed from the use of non-lethal methods under any of the alternatives since no harvest would occur. Non-lethal methods would be available under all the alternatives analyzed; however, the use of GonaCon™ would be restricted to use by the NYSDEC or persons under their supervision under Alternative 2, if registered. Wildlife Services' involvement in the use of or recommendation of non-lethal methods would ensure the potential impacts to non-targets were considered under

WS' Decision Model. Potential direct, indirect, or cumulative impacts to non-targets under this alternative from the use of and/or the recommendation of non-lethal methods are likely to be low to non-existent.

WS would also employ and/or recommend lethal methods under the proposed action alternative to alleviate damage, when those methods were deemed appropriate for use using the WS Decision Model. Lethal methods available for use to manage damage caused by white-tailed deer under this alternative would include the recommendation of harvest during hunting seasons, shooting, and euthanasia chemicals and euthanasia after live-capture. Available methods and the application of those methods to resolve white-tailed deer damage is further discussed in Appendix B.

The use of firearms would essentially be selective for target species since animals would be identified prior to application; therefore, no adverse impacts would be anticipated from use of this method. Similarly, the use of euthanasia methods would not result in non-target harvest since identification would occur prior to euthanizing an animal.

While every precaution would be taken to safeguard against taking non-targets during operational use of methods and techniques for resolving damage and reducing threats caused by white-tailed deer, the use of such methods would result in the incidental harvest of unintended species. The harvest of non-targets would result in declines in the number of individuals in a local population; however, the harvest of non-targets by WS during damage management activities has not occurred. There has been no unintentional harvest or nonlethal capture of non-targets by WS from FY 2003 through FY 2014 while conducting deer damage management. Wildlife Services would continue to monitor activities, including non-target harvest to ensure the annual harvest of non-targets does not result in adverse effects to a species' population. All the species harvested previously can be harvested during annual harvest seasons.

Methods available to resolve and prevent white-tailed deer damage or threats when employed by trained, knowledgeable personnel would be selective for target species. Wildlife Services would report to the NYSDEC any non-target harvest to ensure harvest by WS was considered as part of management objectives established for those species by the NYSDEC.

The use of lethal chemical methods or those methods used to live-capture target species followed by euthanasia also have the potential to affect non-target wildlife through the capture of non-target species. Capture methods used are often methods that would be set to confine or restrain target wildlife after being triggered by a target individual. Capture methods would be employed in such a manner as to minimize the threat to non-target species by placement in those areas frequently used by target wildlife, using baits or lures that are as species specific as possible, and modification of individual methods to exclude non-targets from capture. Most methods described in Appendix B are methods that would be employed to confine or restrain wildlife that would be subsequently euthanized using humane methods. With all live-capture devices, non-target wildlife captured would be released on site if determined to be able to survive following release. SOPs are intended to ensure harvest of non-target wildlife is minimal during the use of methods to capture target wildlife.

Negative impacts of lethal deer management to non-target plants and wildlife would be considered minimal to nonexistent; however, if WS is unable to harvest adequate numbers of deer, harmful impacts from deer on desired ecological conditions may occur as an indirect effect. These indirect impacts may not be visible for decades or

longer, in part, due to the time it takes for ecological processes to manifest (Waller and Alverson 1997, DeCalesta 1997). These indirect impacts would lead to cumulative impacts that include a loss of tree and forb species (DeCalesta 1997, Healy 1997, Schmitz and Sinclair 1997, Tilghman 1989), nesting interior forest migratory birds (DeCalesta 1994, McShea and Rappole 2000), and a lower abundance of some small mammals (Waller and Alverson 1997). If WS is able to harvest adequate numbers of deer, the potential direct impacts to non-targets would include an increase in certain native plant species (DeCalesta 1997, Healy 1997, Schmitz and Sinclair 1997, Tilghman 1989), an increase in small mammals such as squirrels (Waller and Alverson 1997) and an increase in some interior forest nesting bird species (DeCalesta 1994, McShea and Rappole 2000). Cumulative impacts would therefore include a greater diversity and abundance of plant and animal species under this alternative.

T&E Species Effects

Special efforts would be made to avoid jeopardizing T&E species through biological evaluations of the potential effects and the establishment of special restrictions or minimization measures. SOPs to avoid effects on T&E species are described in Chapter 3 of this EA.

Federally Listed Species - The current list of species designated as threatened and endangered in New York, as determined by the USFWS, was reviewed during the development of this EA. Appendix C contains the list of species currently listed in the state along with common and scientific names.

Through our analysis of our potential impacts, we found that all listed threatened and endangered species fell into one of two categories: “No effect” or “May affect, but not likely to adversely affect.”

"No effect" means there will be no impacts, positive or negative, to listed or proposed resources. Generally, this means no listed resources will be exposed to action and its environmental consequences (U.S. Fish and Wildlife Service 2014).

"May affect, but not likely to adversely affect" means that all effects are beneficial, insignificant, or discountable. Beneficial effects have contemporaneous positive effects without any adverse effects to the species or habitat. Insignificant effects relate to the size of the impact and include those effects that are undetectable, not measurable, or cannot be evaluated. Discountable effects are those extremely unlikely to occur (USFWS 2014).

Based on a review of those T&E species listed in the state during the development of the EA, WS determined that activities conducted pursuant to the proposed action may affect but are not likely to adversely affect those species listed in the state by the USFWS, including their critical habitats. As part of the development of the EA, WS consulted with the USFWS under Section 7 of the ESA (Martin Lowney to David Stilwell, November 18, 2014, Appendix E; David Stilwell to Martin Lowney December 17, 2014, Appendix E). The USFWS concurred with WS' determinations.

State Listed Species – The current list of species designated as endangered or threatened by the NYSDEC was reviewed during the development of the EA (see Appendix C). Based on the review of species listed, WS has determined that the proposed activities may affect but are not likely to adversely affect those species currently listed by the state.

WS has reviewed the T&E species listed by the NYSDEC and the USFWS, and has determined that damage management activities proposed by WS would not likely adversely affect T&E species. No cumulative impacts have been identified, and although non-targets may be affected, they are not likely to be adversely affected from any of the alternatives discussed (Martin Lowney to Dan Rosenblatt October 1, 2014, Appendix E; Dan Rosenblatt to Martin Lowney October 8, 2014, Appendix E).

Alternative 2 – White-tailed Deer Damage Management by WS through Technical Assistance Only

Under a technical assistance alternative, methods recommended or provided through loaning of equipment would be employed by those persons requesting assistance. Recommendations would be based on WS' Decision Model using information provided by the person requesting assistance or through site visits. Recommendations would include methods or techniques to minimize non-target impacts associated with the methods being recommended or loaned. Methods recommended would include non-lethal and lethal methods as deemed appropriate by WS' Decision Model and as permitted by laws and regulations.

Direct, Indirect, and Cumulative Impacts:

WS would have no direct impact on non-target species, including T&E species. The potential impacts to non-targets under this alternative would be variable and based on several factors. If methods were employed, as recommended by WS, the potential direct, indirect, and cumulative impacts to non-targets would likely be similar to Alternative 1.

However, the potential for impacts would be based on the knowledge and skill of those persons implementing recommended methods. If those persons experiencing damage do not implement methods or techniques correctly or to the intensity prescribed by WS', the potential impacts from providing only technical assistance would be greater than the proposed action. The incorrect or lower intensity implementation of methods or techniques recommended by WS would lead to an increase in harmful indirect impacts to non-target wildlife and plants because of increased or continued interspecies competition for food and cover or degradation of habitat than would occur under the proposed action alternative. Cumulative impacts would be more deleterious to non-target wildlife or plants if persons chose to implement recommended methods incorrectly or to lower intensity than recommended by WS.

If recommended methods and techniques were not followed or if other methods were employed that were not recommended, the potential impacts on non-target species, including T&E species would likely be higher compared to the proposed action. Direct impacts in urban and suburban areas would include a decrease in interior forest shrub nesting birds and small mammals, and also a decrease in plant species diversity due to more deer being present (DeCalesta 1994, DeCalesta 1997, Healy 1997, Schmitz and Sinclair 1997, Tilghman 1989, McShea and Rappole 2000). Indirect impacts may include a loss of certain plant species due to over browsing by higher deer populations, and the inability for plants to replace themselves, and changes in forest plant species composition over time due to selective browsing (Rawinski 2014).

Impacts in rural areas would be variable and would be similar to the impacts in urban or suburban areas. If non-lethal methods recommended by WS under this alternative were deemed ineffective by those persons requesting assistance, lethal methods would be employed by those persons experiencing damage. Those persons requesting

assistance would likely be those persons that would use lethal methods since a damage threshold had been met for that individual requestor seeking assistance to reduce damage. The potential impacts on non-target wildlife and plants by those persons experiencing damage would be highly variable. In rural areas, legal deer hunting usually resolves damage and reduces harmful impact to non-target wildlife and plants therefore the direct, indirect and cumulative impacts would be similar to alternative 1. People in rural areas whose white-tailed deer damage problems were not effectively resolved by non-lethal control methods would likely resort to other means of legal or illegal lethal control because they have more options than people in suburban or urban areas. The illegal use of methods often results in loss of both target and non-target wildlife (White et al. 1989, USFWS 2001, FDA 2003). The use of illegal toxicants by those persons frustrated with the lack of assistance or assistance that inadequately reduces damage to an acceptable level can result in the indiscriminate harvest of wildlife species. In this situation, if the public harvests more deer than allowed in these rural areas, the direct impacts, as well as longer term indirect impacts, would include an increase in interior forest nesting birds, an increase in plant diversity, and an increase in small mammal abundance; however, the ecosystem would be imbalanced with many fewer deer, a keystone herbivore (Waller and Alverson 1997). Should a potential negative cumulative impact be identified, NYSDEC would reduce the harvest and suspend the issuance of Deer Management Assistance Permits for the harvest of does, and, if warranted, initiate a law enforcement action. Otherwise, in rural areas where the harvest of deer is inadequate then the direct, indirect and cumulative impacts to non-target wildlife and plants would be similar to suburban and urban areas.

The ability to reduce negative impacts caused by white-tailed deer to wildlife species and their habitats, including T&E species, would be variable under this alternative. The ability to reduce risks would be based upon the skills and abilities of the person implementing damage management actions. The cumulative impacts of a technical assistance only management plan would be similar to Alternative 1 if recommendations were followed; or would include an imbalance in plant and animal communities, as well as a loss in plant species diversity across a broad landscape if recommendations are not followed. It would be expected that this alternative would have a greater chance of reducing damage than Alternative 3 since WS would be available to provide information and advice on appropriately employing methods and reducing the risk of non-target harvest.

Alternative 3 – No White-tailed Deer Damage Management Conducted by WS

Under this alternative, WS would not be directly involved with damage management activities in the state. White-tailed deer would continue to be harvested under permits issued by the NYSDEC and harvest would continue to occur during the regulated harvest seasons. Impacts to non-target wildlife and plants and T&E species would continue to occur from those people who implement damage management activities on their own or through recommendations by other federal, state, and private entities. Risks to non-targets and T&E species would continue to occur from those persons who implement deer damage management activities on their own or through recommendations by the other federal, state, and private entities.

Direct, Indirect, and Cumulative Impacts:

In the absence of any involvement by WS, potential direct, indirect, and cumulative impacts would be similar to those impacts under alternatives one and two. In rural areas, legal deer hunting would reduce the direct, indirect and cumulative impacts to non-target wildlife and plants most of the time. In suburban and urban areas, the harmful direct, indirect and cumulative impacts on non-target wildlife and plants would increase, with rare exception. The rare exception where direct, indirect or cumulative impacts on non-target wildlife and plants

would decrease would be where adequate financial resources are provided for many years, the landowner or manager has the necessary deer management expertise and additional lethal deer management methods are permitted by NYSDEC (Boulanger et al. 2014).

The ability to reduce negative impacts caused by white-tailed deer to other wildlife species and their habitats, including T&E species, would be variable based upon the financial resources, skills and abilities of the person implementing damage management actions and additional lethal methods being permitted under this alternative.

4.1.3 Issue 3 - Effects of Damage Management Methods on Human Health and Safety

A common concern is the potential adverse effects that methods available would have on human health and safety. The threats to human safety of methods available under the alternatives are evaluated below by each of the alternatives.

Alternative 1 - Continue the White-tailed Deer Damage Management Program (No Action/Proposed Action)

The cooperator requesting assistance would be made aware through a MOU, cooperative service agreement, or a similar document that those methods agreed upon would potentially be used on property owned or managed by the cooperator. Therefore, the cooperator would be made aware of the possible use of those methods on property they own or manage to identify any risks to human safety associated with the use of those methods. SOPs would also ensure the safety of the public from those methods used to capture or harvest wildlife.

Under the proposed action, those methods discussed in Appendix B would be integrated to resolve and prevent damage associated with white-tailed deer in the state. Wildlife Services would use the Decision Model to determine the appropriate method or methods that would effectively resolve the request for assistance. Those methods would be continually evaluated for effectiveness and if necessary, additional methods would be employed. Non-lethal and lethal methods would be used under the proposed action. Non-chemical methods described in Appendix B would be used within a limited period, would not be residual, and do not possess properties capable of inducing indirect or cumulative effects on human health and safety. Non-chemical methods would be used after careful consideration of the safety of those persons employing methods and to the public. When possible, capture methods would be employed where human activity was minimal to ensure the safety of the public. Capture methods also require direct contact to trigger, ensuring that those methods when left undisturbed would have no direct or indirect impact on human safety. Wildlife Services would continue to provide technical assistance and/or direct operational assistance to those persons seeking assistance with managing damage or threats from white-tailed deer. Risks to human safety from technical assistance conducted by WS would be similar to those risks addressed under Alternative 2. Those non-lethal methods that would be used as part of an integrated approach to managing damage, that would be available for use by WS as part of direct operational assistance, would be similar to those risks associated with the use of those methods under the other alternatives.

Lethal methods available under the proposed action would include the use of euthanasia chemicals, the recommendation of harvest during hunting seasons, and shooting. Those lethal methods available under the proposed action alternative or similar products would also be available under the other alternatives. Euthanasia

chemicals would not be available to the public but those white-tailed deer live-captured would be killed using other methods, and therefore lethal methods would not be restricted to use by WS only.

WS' employees who conduct activities to manage damage caused by white-tailed deer would be knowledgeable in the use of those methods available and WS' directives. That knowledge would be incorporated into the decision-making process inherent with the WS' Decision Model that would be applied when addressing threats and damage caused by white-tailed deer. When employing lethal methods, WS' employees would consider risks to human safety when employing those methods based on location and method. For example, risks to human safety from the use of methods would likely be lower in rural areas that are less densely populated. Consideration would also be given to the location where damage management activities would be conducted based on property ownership. If locations where methods would be employed occur on private property in rural areas where access to the property would be controlled and monitored, the risks to human safety from the use of methods would likely be less. If damage management activities occurred at parks or near other public use areas, then risks of the public encountering damage management methods and the corresponding risk to human safety would increase. Activities would generally be conducted when human activity was minimal (*e.g.*, early mornings, at night) or in areas where human activity was minimal (*e.g.*, in areas closed to the public).

Live-capture devices, such as cannon nets, pose minor safety hazards to the public since activation of the device would occur by trained personnel after target species were observed in the capture area of the net.

Safety issues related to the misuse of firearms and the potential human hazards associated with the use of firearms were issues identified. To help ensure the safe use of firearms and to increase awareness of those risks, WS' employees who use firearms during official duties are required to attend an approved firearm safety-training course and to remain certified for firearm use, must attend a safety training course in accordance with WS Directive 2.615, "WS Firearms Use and Safety". As a condition of employment, WS' employees who carry and use firearms are subject to the Lautenberg Domestic Confiscation Law, which prohibits firearm possession by anyone who has been convicted of a misdemeanor crime of domestic violence (18 USC § 922(g)(9)). A safety assessment based on site evaluations, coordination with cooperating and local agencies (if applicable), and consultation with cooperators would be conducted before firearms were deemed appropriate to alleviate or reduce damage and threats to human safety when conducting activities. Wildlife Services would work closely with cooperators requesting assistance to ensure all safety issues were considered before firearms would be deemed appropriate for use. The use of all methods, including firearms, would be agreed upon with the cooperator to ensure the safe use of those methods. The security of firearms would also occur pursuant to WS Directive 2.615.

The issue of using chemical methods as part of managing damage associated with wildlife relates to the potential for human exposure either through direct contact with the chemical or exposure to the chemical from wildlife that have been exposed. Under the alternatives identified, the use of chemical methods would include immobilizing drugs, euthanasia chemicals, reproductive inhibitors, and repellents.

The use of immobilizing drugs would only be administered to white-tailed deer that have been live-captured using other methods or administered through injection using a projectile (*e.g.*, dart gun). Immobilizing drugs used to sedate wildlife would be used to temporarily handle and transport animals to lessen the distress of the animal from the experience. Drug delivery would likely occur on site with close monitoring of the animal to ensure proper care of the animal. Immobilizing drugs would be reversible with a full recovery of sedated animals occurring.

Drugs used in capturing and handling wildlife that would be available include ketamine, a mixture of ketamine/xylazine, and telazol. A list and description of immobilizing drugs available for use under the identified alternatives can be found in Appendix B.

If white-tailed deer were immobilized for sampling and released, risks would occur to human safety if harvest and consumption occurred. SOPs employed by WS to reduce risks are discussed in Chapter 3 and in Appendix B. SOPs that would be part of the activities conducted include:

All immobilizing drugs used in capturing and handling wildlife would be under the direction and authority of state veterinary authorities, either directly or through procedures agreed upon between those authorities and WS. As determined on a state-level basis by those veterinary authorities (as allowed by Animal Medicinal Drug Use Clarification Act), wildlife hazard management programs may choose to avoid capture and handling activities that utilize immobilizing drugs within a specified number of days prior to the hunting season for the target species to avoid release of animals that may be consumed by hunters prior to the end of established withdrawal periods for the particular drugs used. Ear tagging or other marking of animals drugged and released to alert hunters that they should contact state officials before consuming the animal could be utilized to prevent adverse effects to human health.

Most animals administered immobilizing drugs would be released well before hunting seasons, which would give the drug time to completely metabolize out of the animals' systems before they might be harvested and consumed by people. In some instances, animals collected for control purposes would be euthanized when they are captured within a certain specified time period prior to the legal hunting season to avoid the chance that they would be consumed as food while still potentially having immobilizing drugs in their systems. Meeting the requirements of the Animal Medicinal Drug Use Clarification Act should prevent any adverse effects to human health with regard to this issue (see Appendix D).

Euthanizing chemicals would be administered under similar circumstances to immobilizing drugs. Euthanizing chemicals would be administered to animals live-captured using other methods. Euthanasia chemicals would include sodium pentobarbital, potassium chloride, and Beuthanasia-D. Euthanized animals would be disposed of in accordance with WS Directive 2.515, "Disposal of Wildlife Carcasses"; therefore, would not be available for harvest and consumption. Euthanasia of target animals would occur in the absence of the public to further minimize risks, whenever possible.

The recommendation of repellents or the use of those repellents registered for use to disperse white-tailed deer in the state would occur under the proposed action as part of an integrated approach to managing white-tailed deer damage. Those chemical repellents that would be available to recommend for use or that would be directly used by WS under this alternative would also likely be available under any of the alternatives. Therefore, risks to human safety from the recommendation of repellents or the direct use of repellents would be similar across all the alternatives. There are few chemical repellents registered for use to manage damage caused by white-tailed deer in the state. Repellents must be registered with the EPA according to the FIFRA and with the NYSDEC. Most repellents require ingestion of the chemical to achieve the desired effects on target species. Repellents that require ingestion are intended to discourage foraging on vulnerable resources and to disperse white-tailed deer from areas where the repellents are applied. Many of the repellents currently available for use have active ingredients that are naturally occurring and are generally regarded as safe. Repellents, when used according to

label directions, are generally regarded as safe. Some risk of exposure to the chemical occurs to the applicator and to others from the potential for drift as the product is applied. Some repellents also have restrictions on whether application can occur on edible plants with some restricting harvest for a designated period after application. All restrictions on harvest and required personal protective equipment would be included on the label and if followed, would minimize risks to human safety associated with the use of those products. Risks to human safety would be similar across all the alternatives. Wildlife Services' involvement, either through recommending the use of repellents or the direct use of repellents, would ensure that label requirements of those repellents were discussed with those persons requesting assistance when recommended through technical assistance or would be specifically adhered to by WS' personnel when using those chemical methods. Therefore, the risks to human safety associated with the recommendation of or direct use of repellents would be lessened through WS' participation.

Due to the classification of GonaCon™ as a restricted-use pesticide by the EPA, this product would be restricted to use by federal or state agencies that have successfully completed the requirements of the NYSDEC for the purchase and application of restricted-use pesticides. Risks to human safety would be limited primarily to the actual applicator due to the necessity to capture and inject GonaCon™ into each animal to be vaccinated. During the development of this EA, GonaCon™ was not registered for use in New York; therefore, GonaCon™ would not be available for use within the state. However, this product could be registered for use in New York and would then be administered by NYSDEC or persons working under their authority.

Risks to human safety from the use of GonaCon™ would be minimal and would occur primarily to those persons injecting the deer through accidental self-injection or those persons handling syringes. To reduce the risks of accidental exposure through self-injection, the label of GonaCon™ requires the use of long sleeved shirts, long pants, gloves, socks, and shoes. In addition, injection would only occur after deer had been properly restrained to minimize accidental injection during application to the deer. The label also requires that children be absent from the area during application of the vaccine as well as a warning to women that accidental self-injection would cause infertility. Wildlife Services' employees who were pregnant would not be involved with handling or injecting of the vaccine.

In addition, human exposure would occur through consumption of deer that were treated with GonaCon™. As was discussed previously, the vaccine and the antibodies produced in response to the vaccine are amino acid proteins that if consumed would be broken down by stomach acids and enzymes, posing no risks to human safety. The vaccine would only be used in localized areas where deer populations had exceeded the biological or social carrying capacity. Those areas would likely be places where hunting was prohibited or restricted (*e.g.*, in parks); therefore, the consumption of deer would be unlikely in those areas where the vaccine would be used since hunting would be prohibited or restricted. Deer injected with the vaccine must also be marked for identification, which would allow for placement of warnings to people that would harvest and consume a treated deer. Based on the use pattern of GonaCon™ and the chemical make-up of the vaccine and the antibodies, the risks to human safety from the use of the vaccine would be extremely low and would occur primarily to the handler (EPA 2009).

The recommendation by WS that white-tailed deer be harvested during the regulated hunting seasons that are established by the NYSDEC would not increase risks to human safety above those risks already inherent with hunting white-tailed deer. Recommendations of allowing hunting on property owned or managed by a cooperator to reduce white-tailed deer populations, which would then reduce damage or threats, would not increase risks to

human safety. Safety requirements established by the NYSDEC for the regulated hunting season would further minimize risks associated with hunting. Although hunting accidents do occur, the recommendation of allowing hunting to reduce localized populations of white-tailed deer would not increase those risks.

Direct, Indirect, and Cumulative Impacts:

No adverse direct or indirect impacts to human safety have occurred from WS' use of methods to alleviate deer damage from FY 2003 through FY 2014. The risks to human safety from the use of non-lethal and lethal methods, when used appropriately and by trained personnel, is considered low. No adverse direct effects to human health and safety are expected through the use of live-capture devices or other non-lethal methods. Since WS personnel are required to complete and maintain firearms safety training, no adverse direct effects to human health and safety are expected as a result of the misuse of firearms by WS personnel. Additionally, all WS personnel are properly trained on all chemicals handled and administered in the field, ensuring their safety as well as the safety of the public. Therefore, adverse direct effects to human health and safety from chemicals used by WS are anticipated to be very low. The amount of chemicals used or stored by WS and cooperating agencies would be minimal to ensure human safety. No adverse indirect effects are anticipated from the application of any of the chemicals available for WS. Wildlife Services does not anticipate any additional adverse cumulative impacts to human safety from the use of firearms when recommending that deer be harvested during regulated hunting seasons to help alleviate damage.

Alternative 2 – White-tailed Deer Damage Management by WS through Technical Assistance Only

Under this alternative, WS would be restricted to making recommendations on the use of methods and the demonstration of methods to resolve damage. Wildlife Services would only provide technical assistance to those people requesting assistance with white-tailed deer damage and threats. Although hazards to human safety from non-lethal methods exist, those methods are generally regarded as safe when used by trained individuals who are experienced in their use. Risks to human safety associated with non-chemical methods such as resource management methods (*e.g.*, crop selection, limited habitat modification, modification of human behavior), exclusion devices, and frightening devices would be considered low based on their use profile for alleviating damage associated with wildlife. Although some risk of fire and bodily harm exists from the use of pyrotechnics and propane cannons, when used appropriately and in consideration of those risks, those methods would be used with a high degree of safety.

Under a technical assistance only alternative, the use of immobilizing drugs, euthanasia chemicals, and GonaCon™ would not be available to the public. However, personnel with the NYSDEC or persons working under their authority would use GonaCon™ under this alternative, if registered. Drugs used in capturing and handling wildlife would be administered under the direction and authority of state veterinary authorities, either directly or through procedures agreed upon between those authorities and other entities, such as the NYSDEC. Direct, indirect, and cumulative impacts would be similar to Alternative 1.

If cannon nets were recommended, persons employing nets would be present at the site during application to ensure the safety of the public and operators. Although some fire and explosive hazards exist with rocket nets during ignition and storage of the explosive charges, safety precautions associated with the use of the method, when adhered to, would pose minimal risks to human safety and would primarily occur to the handler. Nets would not be recommended in areas where public activity was high, which would further reduce the risks to the

public. Nets would be recommended for use in areas where public access was restricted whenever possible to reduce risks to human safety. Overall, nets would pose minimal risks to the public, and should not have any direct, indirect or cumulative impacts on human health and safety.

The use of chemical methods that are considered non-lethal would be available under this alternative. Chemical methods available would include repellents. Risks and impacts to human safety associated with the use of repellents by WS or the recommendation of repellents by WS is addressed under the Alternative 1.

The recommendation by WS that white-tailed be harvested during the regulated hunting and season, which is established by the NYSDEC, would not increase risks to human safety above those risks already inherent with hunting white-tailed deer. Recommendations of allowing hunting on property owned or managed by a cooperator to reduce local white-tailed deer populations, which would then reduce white-tailed deer damage or threats would not increase risks to human safety. Safety requirements established by the NYSDEC for the regulated hunting season would further minimize risks associated with those activities. Although hunting accidents do occur, the recommendation of allowing hunting to reduce localized white-tailed deer populations would not increase those risks, and will therefore have no significant direct, indirect, or cumulative impacts on human health and safety.

The recommendation of shooting with firearms as a method of direct harvest may occur under this alternative. Safety issues do arise related to misusing firearms and the potential human hazards associated with firearms use when employed to reduce damage and threats. When used appropriately and with consideration for human safety, risks associated with firearms would be minimal. If firearms were employed inappropriately or without regard to human safety, serious injuries or death would occur. Under this alternative, recommendations for the use of firearms by the public would include human safety considerations, such as setbacks from dwellings. Since the use of firearms to alleviate white-tailed deer damage would be available under any of the alternatives and the use of firearms by those persons experiencing white-tailed deer damage would occur whether WS was consulted or contacted, the risks to human safety from the use of firearms by the public would be similar among all the alternatives. Therefore, when firearms are used appropriately, there should not be significant negative direct, indirect, or cumulative impacts to human health and safety from the recommendation of firearm use.

If non-chemical methods were employed according to recommendations and as demonstrated by WS, the potential risks to human safety would be similar to the proposed action, and there would not be any direct, indirect, or cumulative impacts. If methods were employed without guidance from WS or applied inappropriately, the risks to human safety would increase. The extent of the increased risk would be unknown and variable. Non-chemical methods inherently pose minimal risks to human safety given the design and the extent of the use of those methods.

Direct, Indirect, and Cumulative Impacts:

Since most methods available to resolve or prevent deer damage or threats are available to anyone, the direct, indirect, and cumulative effects to human safety from the use of those methods are similar between the alternatives. Private efforts to reduce or prevent damage would be expected to increase, and would likely result in less experienced persons implementing chemical or other damage management methods which may have variable adverse direct, indirect, and/or cumulative effects to human and pet health and safety than under Alternative 1. Ignorance and/or frustration caused by the inability to reduce losses could lead to illegal use of toxicants by others which could lead to unknown direct, indirect, and/or cumulative impacts to humans and pets.

Alternative 3 – No White-tailed Deer Damage Management Conducted by WS

Under the no involvement by WS alternative, WS would not be involved with any aspect of managing damage associated with white-tailed deer, including technical assistance. Due to the lack of involvement in managing damage caused by white-tailed deer, no impacts to human safety would occur directly from WS. This alternative would not prevent those entities experiencing threats or damage from white-tailed deer from conducting damage management activities in the absence of WS' assistance. The direct burden of implementing permitted methods would be placed on those people experiencing damage or would require those persons to seek assistance from other entities.

Direct, Indirect, and Cumulative Impacts:

Similar to the technical assistance only alternative, GonaCon™, immobilizing drugs, and euthanasia chemicals would not be available under this alternative to the public except when working with a licensed veterinarian or with other persons licensed by the DEA to use those materials. However, repellents would continue to be available to those persons with the appropriate pesticide applicators license. Since most methods available to resolve or prevent white-tailed deer damage or threats would be available to anyone, the threats to human safety from the use of those methods would be slightly greater than Alternative 1 and 2 because WS would provide no technical assistance. However, methods employed by persons who are not experienced in the proper use of these recommended methods would increase threats to human safety, and lead to variable direct, indirect, and cumulative impacts. Additionally, direct hazards to humans would be greater under this alternative if other non-recommended chemicals that were less selective were used. It is hypothetically possible that frustration caused by the inability to alleviate deer damage would lead to illegal use or misuse of certain chemical repellents. However, the legal chemical methods available to the public, when applied correctly and appropriately, would pose minimal risks to human safety.

Shooting deer when permitted by the state would be available as a legal method to alleviate deer damage. Threats to human safety would vary depending upon experience, training and knowledge of the person shooting deer in a deer damage management situation. Private citizens would likely have less experience, training and knowledge shooting deer in damage management situations than WS and the risk to human safety would likely be greater. Similarly, many private deer damage management companies would have less experience and training shooting deer in damage management situations than WS and the risk to human safety would likely be greater but less than the risk from private citizens shooting. Although local police would have more knowledge and training with firearm safety than general public, they would also have less experience and training conducting deer damage management and there would be more risk to human safety than if WS was conducting the deer damage management action. A few private nuisance wildlife control companies have similar experience, training and knowledge shooting deer in damage management situations and the risk would be similar to WS conducting the action. Summarily, the shooting activities described in the EA for deer damage management require very high levels of training and expertise.

4.1.4 Issue 4 - Effects on the Socio-cultural Elements of the Human Environment

Another concern often raised is the potential impact the alternatives would have on the aesthetic benefits that people experience from white-tailed deer. These affectionate bonds can be formed in many ways, but many are

formed because of illegal activity (e.g., feeding, trespassing). The effects of the alternatives on this issue are analyzed below by alternative.

Alternative 1 - Continue the Current White-tailed Deer Damage Management Program (No Action/Proposed Action)

In the wild, few animals in the United States have life spans approaching that of humans. Mortality is high among wildlife populations and specific individuals among a species may experience death early in life. This is a natural occurrence and humans who form affectionate bonds with animals experience loss of those animals over time in most instances. A number of professionals in the field of psychology have studied human behavior in response to attachment to pet animals (Gerwolls and Labott 1994, Marks and Koepke 1994, Zasloff 1996, Archer 1999, Ross and Baron-Sorensen 1998, Meyers 2000). Similar observations were probably applicable to close bonds that would exist between people and wild animals. As observed by researchers in human behavior, normal human responses to loss of loved ones proceed through phases of shock or emotional numbness, sense of loss, grief, acceptance of the loss or what cannot be changed, healing, and acceptance and rebuilding which leads to resumption of normal lives (Lefrancois 1999). Those who lose companion animals, or animals for which they may have developed a bond and affection, are observed to proceed through the same phases as with the loss of human companions (Gerwolls and Labott 1994, Boyce 1998, Meyers 2000). However, they usually establish a bond with other individual animals after such losses. Although they may lose the sense of enjoyment and meaning from the association with those animals that die or are no longer accessible, they usually find a similar meaningfulness by establishing an association with new individual animals or through other relational activities (Weisman 1991). Through this process of coping with the loss and establishing new affectionate bonds, people may avoid compounding emotional effects resulting from such losses (Lefrancois 1999).

Some wild or escaped domestic white-tailed deer with which humans have established affectionate bonds may be removed from some project sites by WS, which would lead to public outcry. These bonds, although valuable, cannot outweigh certain risks such as risks to human health and safety or harm to the environment. Additionally, other wild white-tailed deer would likely continue to be present in the affected area and people would tend to establish new bonds with those remaining animals. Furthermore, human behavior processes usually result in individuals ultimately returning to normalcy after experiencing the loss of association with a wild animal that might be removed from a specific location. Wildlife Services' activities would not be expected to have any cumulative effects on this element of the human environment.

Under the proposed action, methods would be employed that would result in the dispersal, exclusion, or removal of individuals or small groups of white-tailed deer to resolve damage and threats. The goal under the proposed action would be to respond to requests for assistance and to manage those white-tailed deer responsible for the resulting damage. In most cases, the white-tailed deer removed by WS would be removed by the person experiencing damage or removed by other entities if no assistance was provided by WS.

Direct, Indirect, and Cumulative Effects:

In some instances where white-tailed deer were dispersed or removed, the ability of interested persons to observe and enjoy those white-tailed deer would likely temporarily decline. Even the use of exclusionary devices can lead to the dispersal of wildlife if the resource being damaged was acting as an attractant. Thus, once the attractant has

been removed or made unavailable, the wildlife would likely disperse to other areas where resources would be more vulnerable.

The use of lethal methods would result in temporary declines in local populations resulting from the removal of white-tailed deer to address or prevent damage and threats. Therefore, the ability to view and enjoy white-tailed deer would remain if a reasonable effort were made to locate white-tailed deer outside the area in which damage management activities were occurring.

All activities would be conducted where a request for assistance was received and only after the cooperator and WS had signed a cooperative service agreement or similar document. Some aesthetic value would be gained by the removal of white-tailed deer and the return of a more natural environment, including the return of native wildlife and plant species that may be suppressed or displaced by high white-tailed deer densities.

Some people experience a decrease in aesthetic enjoyment of wildlife because they feel that overabundant species are objectionable and interfere with their enjoyment of wildlife in general. Continued increases in numbers of individuals or the continued presence of white-tailed deer may lead to further degradation of some people's enjoyment of any wildlife or the natural environment. The actions of WS would positively affect the aesthetic enjoyment of wildlife for those people that were being adversely affected by the target species identified in this EA.

White-tailed deer population objectives are established and enforced by the NYSDEC through the regulation of harvest during the statewide harvest seasons after consideration of other known mortality factors. Therefore, WS would have no direct impact on the status of white-tailed deer populations since all harvest by WS occurs at the discretion of the NYSDEC. Since those persons seeking assistance would remove white-tailed deer from areas where damage was occurring when permitted by the NYSDEC, WS' involvement would not likely be additive and would have no effect on the aesthetic value of white-tailed deer in the area where damage was occurring. When damage caused by white-tailed deer has occurred, any removal of white-tailed deer by the property or resource owner would likely occur whether WS was involved with taking the white-tailed deer or not. Given the limited harvest proposed by WS under this alternative when compared to the known sources of mortality of white-tailed deer and the population estimates of those species, WS' white-tailed deer damage management activities conducted pursuant to the proposed action would not adversely affect the aesthetic value of white-tailed deer. The impact on the aesthetic value of white-tailed deer and the ability of the public to view and enjoy white-tailed deer under the proposed action would be similar to the other alternatives and would likely be low. Direct impacts would be variable based on public perception, and may either include an increase or decrease in aesthetic benefits based on the individual's view. No indirect or cumulative impacts on aesthetics are expected under this alternative.

Alternative 2 – White-tailed Deer Damage Management by WS through Technical Assistance Only

When people seek assistance with managing damage from either WS or another entity, the damage level has often reached an unacceptable economic threshold for that particular person. Therefore, in the case of white-tailed deer damage, the social acceptance level of those white-tailed deer causing damage has reached a level where assistance has been requested and those persons would likely apply methods or seek those entities that would apply those methods based on recommendations provided by WS or by other entities. Based on those

recommendations, methods would be employed by the requestor that would result in the dispersal and/or removal of white-tailed deer responsible for damage or threatening safety.

Direct, Indirect, and Cumulative Impacts:

If those persons seeking assistance from WS were persons likely to conduct damage management activities in the absence of WS' involvement, then technical assistance provided by WS would not adversely affect the aesthetic value of white-tailed deer, similar to Alternative 1. White-tailed deer would be harvested under this alternative by those entities experiencing white-tailed deer damage or threats, which would result in localized reductions in the presence of white-tailed deer at the location where damage was occurring. The presence of white-tailed deer where damage was occurring would be reduced where damage management activities were conducted under any of the alternatives. Even the recommendation of non-lethal methods would likely result in the dispersal of white-tailed deer from the area if those non-lethal methods recommended by WS were employed by those persons receiving technical assistance. Therefore, technical assistance provided by WS would not prevent the aesthetic enjoyment of white-tailed deer since any activities conducted to alleviate white-tailed deer damage would occur in the absence of WS' participation in the action, either directly or indirectly.

If those white-tailed deer causing damage were dispersed or removed by those persons experiencing damage based on recommendations by WS or other entities, the direct, indirect, and cumulative impacts on the aesthetic values of white-tailed deer under this alternative would be similar to those addressed in the proposed action in Alternative 1. Similar to the other alternatives, the geographical area in which damage management activities would occur would not be such that white-tailed deer would be dispersed or removed from such large areas that opportunities to view and enjoy white-tailed deer would be severely limited.

The potential impacts on aesthetics from a technical assistance program would only be lower than the proposed action if those individuals experiencing damage were not as diligent in employing those methods as WS would be if conducting an operational program or if no further action was taken by the requester. If those persons experiencing damage abandoned the use of those methods or conducted no further actions, then white-tailed deer would likely remain in the area and available for viewing and enjoying for those persons interested in doing so. In this situation, there would be no direct, indirect or cumulative impacts to the aesthetic value of white-tailed deer.

Alternative 3 – No White-tailed Deer Damage Management Conducted by WS

Under the no white-tailed deer damage management by WS alternative, the actions of WS would have no impact on the aesthetic value of white-tailed deer. Those people experiencing damage or threats from white-tailed deer would be responsible for researching, obtaining, and using all methods as permitted by federal, state, and local laws and regulations. White-tailed deer would continue to be dispersed and harvested under this alternative. Harvest would continue to occur when permitted by the NYSDEC through the issuance of permits, harvest would occur during the regulated harvest season, and in the case of non-regulated species, harvest would occur any time without the need for a permit.

Direct, Indirect, and Cumulative Impacts:

Since white-tailed deer would continue to be harvested under this alternative, despite WS' lack of involvement, the ability to view and enjoy white-tailed deer would likely be similar to the other alternatives. The lack of WS' involvement would not lead to a reduction in the number of white-tailed deer dispersed or harvested since WS' has no authority to regulate harvest or the harassment of white-tailed deer. The NYSDEC with management authority over white-tailed deer would continue to adjust all harvest levels based on population objectives for white-tailed deer. Therefore, the number of white-tailed deer harvested annually through hunting and under permits would be regulated and adjusted by the NYSDEC.

Those people experiencing damage or threats would continue to use those methods they feel appropriate to resolve damage or threats, including harvest or would seek the direct assistance of other entities. Therefore, WS would have no impact under this alternative. The impacts to the aesthetic value of white-tailed deer would be similar to the other alternatives but it is hypothetically possible that frustration caused by the inability to reduce damage and associated losses would lead to illegal harvest of white-tailed deer. This would potentially lead to higher harvest levels than legally allowed which would result in direct impact of a decrease in aesthetics due to the reduction in deer population. Indirect and cumulative impacts would be variable and would be dependent on harvest levels and public response.

4.1.5 Issue 5 - Humaneness and Animal Welfare Concerns of Methods

A common issue often raised is concerns about the humaneness of methods available under the alternatives for resolving white-tailed deer damage and threats. The issues of method humaneness relating to the alternatives are discussed below.

Alternative 1 - Continue the Current Adaptive Integrated White-tailed Deer Damage Management Program (No Action/Proposed Action)

Under the proposed action, WS would integrate methods using WS' Decision Model as part of technical assistance and direct operational assistance. Methods available under the proposed action would include non-lethal and lethal methods integrated into direct operational assistance conducted by WS. Under this alternative, non-lethal methods would be used by WS that are generally regarded as humane. Non-lethal methods that would be available include resource management methods (*e.g.*, crop selection, limited habitat modification, modification of human behavior), translocation as part of a reintroduction or restoration, exclusion devices, frightening devices, reproductive inhibitors, nets, immobilizing drugs, and repellents.

As discussed previously, humaneness, in part, appears to be a person's perception of harm or pain inflicted on an animal. People may perceive the humaneness of an action differently. The objective in coping with this issue is to try to achieve the least amount of animal suffering.

Some individuals believe any use of lethal methods to resolve damage associated with wildlife is inhumane because the resulting fate is the death of the animal. Others believe that certain lethal methods can lead to a humane death. Others believe most non-lethal methods of capturing wildlife to be humane because the animal is generally unharmed and alive. Still others believe that any disruption in the behavior of wildlife is inhumane. With the multitude of perspectives on the meaning of humaneness and the varying opinions on the most effective way to address damage and threats in a humane manner, agencies are challenged with conducting activities and

employing methods that are perceived to be humane while assisting those persons requesting assistance to manage damage and threats associated with wildlife. The goal of WS would be to use methods as humanely as possible to effectively resolve requests for assistance to reduce damage and threats to human safety. Wildlife Services would continue to seek new methods and ways to improve current technology to improve the humaneness of methods used to manage damage caused by wildlife. Cooperation with individuals and organizations involved in animal welfare continues to be important for the purpose of evaluating strategies and defining research aimed at developing humane methods.

Some methods have been stereotyped as “*humane*” or “*inhumane*”. However, many “*humane*” methods can be inhumane if not used appropriately. For instance, a cage trap would generally be considered by most members of the public as “*humane*.” Yet, without proper care, live-captured wildlife in a cage trap can be treated inhumanely if not attended to appropriately.

Therefore, the goal would be to effectively address requests for assistance using methods in the most humane way possible that minimizes the stress and pain to the animal. Overall, the use of resource management methods, harassment methods, and exclusion devices are regarded as humane when used appropriately. Although some concern arises from the use of live-capture methods, the stress of animals is likely temporary. Some issues of humaneness would occur from the use of reproductive inhibitors, translocation, immobilizing drugs, nets, and repellents; those methods, when used appropriately and by trained personnel, would not result in the inhumane treatment of wildlife. Concerns from the use of those non-lethal methods would be from injuries to animals while those animals were restrained and from the stress of the animal while being restrained or during the application of the method. Pain and physical restraint can cause stress in animals and the inability of animals to effectively deal with those stressors can lead to distress. Suffering occurs when action is not taken to alleviate conditions that cause pain or distress in animals.

If white-tailed deer were to be live-captured by WS, WS’ personnel would be present on-site during capture events to ensure white-tailed deer captured were addressed timely to prevent injury. Although stress would occur from being restrained, timely attention to live-captured wildlife would alleviate suffering. Stress would likely be temporary.

Under the proposed action, lethal methods would also be employed to alleviate or prevent white-tailed deer damage and threats, when requested. Lethal methods would include shooting, euthanasia chemicals, and the recommendation of harvest during hunting seasons. In addition, target species live-captured using non-lethal methods would be euthanized by WS. Wildlife Services’ use of lethal control methods under the proposed action would follow those required by WS’ directives (see WS Directive 2.505, “Wildlife Euthanasia”, WS Directive 2.430, “Controlled Chemical Immobilization and Euthanasia Agents”).

The euthanasia methods being considered for use under the proposed action for live-captured white-tailed deer are gunshot, and barbiturates or potassium chloride in conjunction with general anesthesia. Those methods are considered acceptable methods by the AVMA for euthanasia and the use of those methods would meet the definition of euthanasia (Leary et al. 2013). The use of barbiturates and potassium chloride for euthanasia would occur after the animal had been live-captured and would occur away from public view. Although the AVMA guideline also lists gunshot as a conditionally acceptable method of euthanasia for free-ranging wildlife, there is greater potential the method may not consistently produce a humane death (Leary et al. 2013). Wildlife Services’

personnel that employ firearms to address white-tailed deer damage or threats to human safety would be trained in the proper placement of shots to ensure a timely and quick death.

Direct, Indirect, and Cumulative Impacts:

Research and development by WS has improved the selectivity and humaneness of management techniques. Research is continuing to bring new findings and products into practical use. Until new findings and products are found practical, a certain amount of animal suffering would occur when some methods were used in situations where non-lethal damage management methods were not practical or effective. Personnel from WS would be experienced and professional in their use of management methods. Consequently, management methods would be implemented in the most humane manner possible. Many of the methods discussed in Appendix B to alleviate white-tailed deer damage and/or threats would be used under any of the alternatives by those persons experiencing damage regardless of WS' direct involvement. The only methods that would not be available to those persons experiencing damage associated with white-tailed deer would be reproductive inhibitors, immobilizing drugs, and euthanasia drugs, except when working with a licensed veterinarian or with other persons licensed by the DEA to use those materials. Therefore, the issue of humaneness associated with methods would be similar across any of the alternatives since those methods would be employed by other entities in the absence of WS' involvement. Those persons who view a particular method as humane or inhumane would likely continue to view those methods as humane or inhumane under any of the alternatives. Wildlife Services would employ methods as humanely as possible by applying SOPs to minimize pain and that allow wildlife captured to be addressed in a timely manner to minimize distress. Through the establishment of SOPs that guide WS in the use of methods to address damage and threats associated with white-tailed deer, there would be no cumulative impacts on the issue of method humaneness. Direct impacts would be minimal, and no indirect impacts were identified for this issue. All methods would be evaluated to ensure SOPs were adequate and that wildlife captured were addressed in a timely manner to minimize distress. SOPs that would be incorporated into WS' activities to ensure methods were used by WS as humanely as possible are listed in Chapter 3.

Alternative 2 – White-tailed deer Damage Management by WS through Technical Assistance Only

The issue of humaneness of methods under this alternative would be perceived to be similar to humaneness issues discussed under the proposed action. This perceived similarity would be derived from WS' recommendation of methods that some people may consider inhumane. Wildlife Services would not directly be involved with damage management activities under this alternative. However, the recommendation of the use of methods would likely result in the requester employing those methods. Therefore, by recommending methods and thus a requester employing those methods, the issue of humaneness would be similar to the proposed action. Under Alternative 2, WS would recommend the use of euthanasia methods pursuant to WS Directive 2.505, "Wildlife Euthanasia". However, the person requesting assistance would determine what methods to use to euthanize or kill a live-captured animal under Alternative 2.

Direct, Indirect, and Cumulative Impacts:

WS would instruct and demonstrate the proper use and placement of methodologies to increase effectiveness in capturing target white-tailed deer species and to ensure methods were used in such a way as to minimize pain and suffering. However, the efficacy of methods employed by a cooperator would be based on the skill and knowledge of the requestor in resolving the threat to safety or damage situation despite WS' demonstration. Therefore, a lack of understanding of the behavior of white-tailed deer or improperly identifying the damage

caused by white-tailed deer along with inadequate knowledge and skill in using methodologies to resolve the damage or threat would lead to incidents with a greater probability of being perceived as inhumane. In those situations, the potential for pain and suffering would likely be regarded as greater than discussed in the proposed action, and direct, indirect or cumulative impacts would be variable depending on methods used and efficacy, but would likely increase compared to Alternative 1.

Alternative 3 – No White-tailed Deer Damage Management Conducted by WS

Under this alternative, WS would not be involved with any aspect of white-tailed deer damage management in New York. Those people experiencing damage or threats associated with white-tailed deer would continue to use those methods legally available. Those methods would likely be considered inhumane by those persons who would consider methods proposed under any alternative as inhumane. The issue of humaneness would likely be directly linked to the methods legally available to the public since methods are often labeled as humane or inhumane by segments of society no matter the entity employing those methods.

Direct, Indirect, and Cumulative Impacts:

The humaneness of methods would be based on the skill and knowledge of the person employing those methods. A lack of understanding of the target species or methods used would lead to an increase in situations perceived as being inhumane to wildlife despite the method used. Despite the lack of involvement by WS under this alternative, those methods perceived as inhumane by certain individuals and groups would still be available to the public to use to resolve damage and threats caused by white-tailed deer. Under Alternative 3, euthanasia or killing of live-captured animals would also be determined by those persons employing methods to live-capture wildlife. Therefore, direct, indirect or cumulative impacts would be variable depending on methods used and efficacy, but would likely increase compared to Alternative 1.

4.1.6 Issue 6 - Effects of White-tailed deer Damage Management Activities on the Regulated Harvest of White-tailed deer

The populations of white-tailed deer are sufficient to allow for annual harvest seasons that typically occur during the fall. Hunting seasons are established by the NYSDEC. The estimated number of white-tailed deer harvested during the season is reported by the NYSDEC in published reports.

Alternative 1 - Continue the Current White-tailed Deer Management Program (No Action/Proposed Action)

WS' white-tailed deer damage management activities would primarily be conducted on populations in areas where hunting is restricted (*e.g.*, restrictions under local or state firearms ordinances) or has been ineffective at meeting local management goals. The use of non-lethal or lethal methods often disperses white-tailed deer from areas where damage is occurring to areas outside the damage area, which may serve to move white-tailed deer, from those less accessible areas to places accessible to hunters. Wildlife Services may harvest deer in New York after a permit is issued by NYSDEC, the managing authority on deer.

Direct, Indirect, and Cumulative Impacts:

WS' proposed take would represent only 2.44% of the 2014 harvest. With oversight of white-tailed deer populations by the NYSDEC, the number of white-tailed deer allowed to be harvested by WS would not limit the ability of those persons interested in harvesting white-tailed deer during the regulated season. Most white-tailed deer damage management projects would occur in urban or suburban areas where regulated hunting is prohibited or firearm and bow discharge laws preclude effective deer harvest. In these locations, WS' harvest of deer would have little to no effect on regulated hunting. Additionally, some properties may prevent access by hunters due to safety or security concerns. Where hunter access is denied due to safety or security concerns, WS' effect on regulated harvest would be negligible. All harvest by WS would be reported to the NYSDEC annually to ensure harvest by WS was incorporated into population management objectives established for white-tailed deer populations. Based on the limited harvest proposed by WS and the oversight by the NYSDEC, WS' harvest of white-tailed deer annually would have no effect on the ability of those persons interested in harvesting white-tailed deer during the regulated harvest season. Overall, WS does not anticipate any significant direct, indirect, or cumulative impacts on the regulated harvest of white-tailed deer.

Alternative 2 – White-tailed deer Damage Management by WS through Technical Assistance Only

Under the technical assistance only alternative, WS would have no direct impact on white-tailed deer populations. Harvest would occur during the annual hunting season in areas where those activities were permitted. Wildlife Services' recommendation of lethal methods would lead to an increase in the use of those methods. However, the number of white-tailed deer allowed to be harvested under a permit and during the regulated hunting seasons would be determined by the NYSDEC.

Direct, Indirect, and Cumulative Impacts:

If WS recommended the use of non-lethal methods and those non-lethal methods were employed by those persons experiencing damage, white-tailed deer would likely be dispersed from the damage area to areas outside the damage area, which would serve to move those white-tailed deer from those less accessible areas to places accessible to hunters. Although lethal methods would be recommend by WS under a technical assistance only alternative, the use of those methods would only occur after the property owner or manager received a permit from the NYSDEC. Wildlife Services' recommendation of the use of lethal methods under this alternative would not limit the ability of those persons interested in harvesting white-tailed deer during the regulated season since the NYSDEC determines the number of white-tailed deer that may be harvested during the hunting season and under permits. Therefore, WS does not anticipate any significant direct, indirect, or cumulative impacts on the regulated harvest of white-tailed deer under this alternative.

Alternative 3 – No White-tailed deer Damage Management Conducted by WS

WS would have no direct, indirect, or cumulative impacts under this alternative as WS would have no involvement with any aspect of white-tailed deer damage management. The NYSDEC would continue to regulate populations through adjustments of the allowed harvest during the regulated harvest season and the continued use of permits.

SUMMARY

No significant cumulative environmental impacts are expected from any of the three alternatives. Under the proposed action, the lethal removal of deer by WS is not expected to have significant impacts on overall deer

population in New York, but some short-term local reductions may occur. No risk to public safety is expected when WS' programs are provided and accepted by requesting individuals in Alternative 1 since only trained and experienced wildlife biologists/specialists would conduct and recommend management activities. There is a slight increased risk to public safety when persons who reject WS assistance and recommendations in alternatives 1 and 2 conduct their own activities, and when no WS assistance is provided in alternative 3. In all three alternatives, however, the increase in risk is not expected to rise to the level of significance. Although some people may be opposed to WS's participation in deer damage management activities on public and private lands within New York, the analysis in this EA indicates that WS Integrated Deer Damage Management program will not result in significant cumulative impacts on the quality of the human environment.

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APPENDIX A: LITERATURE CITED

- American Lyme Disease Foundation, Inc. 2010. Deer and tick ecology. <<http://www.aldf.com/deerTickEcology.shtml>>. Accessed 7 April 2015.
- American Lyme Disease Foundation, Inc. 2011. U.S. Maps and Statistics. <<http://www.aldf.com/usmap.shtml>>. Accessed 7 April 2015.
- Archer, J. 1999. The nature of grief: The evolution and psychology of reactions to loss. Taylor and Francis/Routledge, Florence, Kentucky.
- Australian Government Department of Agriculture. 2014. Foot-and-Mouth Disease. <<http://www.daff.gov.au/animal-plant-health/pests-diseases-weeds/animal/fmd>>. Accessed 21 May 2014.
- AVMA. 1987. Panel report on the colloquium on recognition and alleviation of animal pain and distress. Journal of the American Veterinary Medical Association 191:1186-1189.
- Beasom, S. L., W. Evans, and L. Temple. 1980. The drive net for capturing western big game. Journal of Wildlife Management. 44: 478-480.
- Beaver, B. V., W. Reed, S. Leary, B. McKieran, F. Bain, R. Schultz, B. T. Bennett, P. Pascoe, E. Shull, L. C. Cork, R. Francis-Floyd, K. D. Amass, R. Johnson, R. H. Schmidt, W. Underwood, G. W. Thorton, and B. Kohn. 2001. 2000 Report of the AVMA panel on euthanasia. Journal of the American Veterinary Medical Association 218:669-696.
- Beringer, J., L. P. Hansen, J. A. Demand, J. Sartwell, M. Wallendorf, and R. Mange. 2002. Efficacy of translocation to control urban deer in Missouri: costs, efficiency, and outcome. Wildlife Society Bulletin 30:767-774.
- Bernatas, S. 2014a. Aerial Infrared Imaging Wildlife Survey: Report prepared for the New York City Department of Parks and Recreation, Staten Island, Vision Air Research, Inc. New York City, NY, USA.
- Bernatas, S. 2014b. Aerial Infrared Imaging Wildlife Survey: Report prepared for the New York City Department of Parks and Recreation, Bronx, Vision Air Research, Inc. New York City, NY, USA.
- Bernatas, S. 2015. Aerial Infrared Imaging Wildlife Survey: Report prepared for the New York City Department of Parks and Recreation, Bronx River and Pelham Parks, Vision Air Research, Inc. New York City, NY, USA.
- Berryman, J. H. 1991. Animal damage management: Responsibilities of various agencies and the need for coordination and support. Proceedings of the Eastern Wildlife Damage Control Conference. 5:12-14.
- Bird, T. 2013. Tick bite likely caused death of Hudson Valley teen: doctors. DailyNews. 22 August 2013 . <<http://www.nydailynews.com/new-york/tick-bite-caused-death-hudson-valley-teen-doctors-article-1.1433604>>. Accessed 7 April 2015.
- Bishop, R. C. 1987. Economic values defined. Pages 24-33 in D. J. Decker and G. R. Goff, editors. Valuing wildlife: economic and social perspectives. Westview Press, Boulder, CO.

- Boerner, R. E. and J. A. Brinkman. 1996. Ten years of tree seedling establishment and mortality in an Ohio deciduous forest complex. *Bulletin of the Torrey Botanical Club*. 123:309-317.
- Boggess, E. K. 1994. Raccoons. Pages C101-C107 in S. E. Hygnstrom, R. M. Timm and G. E. Larson, editors. *Prevention and control of wildlife damage*. University of Nebraska Cooperative Extension, USDA-APHIS-ADC, and Great Plains Agricultural Council Wildlife Committee. Lincoln, Nebraska, USA.
- Boyce, P. S. 1998. The social construction of bereavement: an application to pet loss. *Dissertation Abstracts International Section A: Humanities and Social Sciences*. Vol 59(4-A). US: University Microfilms International.
- Boulanger, J. R., P. D. Curtis, E G. Cooch, A. J. DeNicola. 2012. Sterilization as an alternative deer control technique: a review. *Human Wildlife Interactions* 6:273-282.
- Boulanger, J. R., P. D. Curtis and B. Blossey. 2014. An integrated approach for managing white-tailed deer in suburban environments: the Cornell University study. *Northeast Wildlife Damage Cooperative*. Cornell University, Ithaca, NY.
- Bratton, S. P. 1982. The Effects of Exotic Plant and Animal Species on Nature Preserves. *Natural Areas Journal* 2:3-13.
- Brookhaven National Laboratory. 2011. Public Health Assessment. <<http://www.atsdr.cdc.gov/HAC/pha/BrookhavenNationalLab/BrookhavenNatLabFinalPHA08012011.pdf>>. Accessed 7 April 2015.
- Brown, T. L., D. J. Decker, and P. D. Curtis. 2004. Farmers' estimates of economic damage from white-tailed deer in New York State. *HDRU Series no. 04-3*. Cornell University, New York, USA.
- California Department of Fish and Game. 1991. Final environmental document - bear hunting. Title 14 California Code of Regulations. California Department of Fish and Game, California, USA.
- Casey, D., and D. Hein. 1983. Effects of heavy browsing on a bird community in deciduous forest. *Journal of Wildlife Management* 47:829-836.
- CDC. 1990. Compendium of Rabies Control. *Morbidity and Mortality Weekly Report*. 39 No. RR-4:6.
- Center for Disease Control and Prevention. 2010. Tickborne Diseases of the U.S. <<http://www.cdc.gov/ticks/diseases/>>. Accessed 7 April 2015.
- Center for Disease Control and Prevention. 2012. Statistics and epidemiology. Annual cases of Ehrlichiosis in the United States. <<http://www.cdc.gov/ehrlichiosis/stats/>>. Accessed 7 April 2015.
- Civiletti, D. 2011. Deer mating season means more collisions on local roads. *The World News II*. 24 October 2011.
- Conover, M. R. 1997. Monetary and intangible valuation of deer in the United States. *Wildlife Society Bulletin* 25:298-305.
- Conover, M. R. 1982. Behavioral techniques to reduce bird damage to blueberries: Methiocarb and hawk-kite predator model. *Wildlife Society Bulletin* 10:211-216.

- Conover, M. R., W. C. Pitt, K. K. Kessler, T. J. DuBow, and W. A. Sanborn. 1995. Review of human injuries, illnesses, and economic losses caused by wildlife in the United States. *Wildlife Society Bulletin* 23:407-414.
- Courchamp F., J. L. Chapuis, and M. Pascal. 2003. Mammal invaders on islands: impact, control and control impact. *Biological Reviews* 78:347-383.
- Craig, J. R., J. D. Rimstidt, C. A. Bonnaffon, T. K. Collins, and P. F. Scanlon. 1999. Surface water transport of lead at a shooting range. *Bulletin of Environmental Contamination and Toxicology*. 63:312-319.
- Craven, S. R., and S. E. Hygnstrom. 1994. Deer. Pages D25-D40 in S. E. Hygnstrom, R. M. Timm and G. E. Larson, editors. *Prevention and Control of Wildlife Damage*. University of Nebraska Cooperative Extension, USDA-APHIS-ADC, and Great Plains Agricultural Council Wildlife Committee. Lincoln, Nebraska, USA.
- Dapson, R. W., P. R. Ramsey, M. H. Smith, and D. F. Urbston. 1979. Demographic differences in contiguous populations of white-tailed deer. *Journal of Wildlife Management* 43:889-898.
- Deblinger, R. D., M. L. Wilson, D. W. Rimmer, and A. Spielman. 1993. Reduced abundance of *Ixodes scapularis* (Acari: Ixodidae) following incremental removal of deer. *Journal of Medical Entomology* 30:144-150.
- DeCalesta, D.S. 1994. Effect of white-tailed deer on songbirds within managed forests in Pennsylvania. *Journal of Wildlife Management* 58:711-718.
- DeCalesta, D. 1997. Deer and ecosystem management. Pages 267-279 In W. J. McShea, H. B. Underwood, and J. H. Rappole, editors. *The science of overabundance: deer ecology and population management*. Smithsonian Institution Press, Washington, D.C., USA.
- DeCalesta, David S. and S. L. Stout. 1997. Relative deer density and sustainability: A conceptual framework for integrating deer management with ecosystem management. *Wildlife Society Bulletin*. 25:252-258.
- Decker, D. J., and G. R. Goff. 1987. *Valuing wildlife: economic and social perspectives*. Westview Press, Boulder, Colorado, USA.
- Decker, D. J., and K. G. Purdy. 1988. Toward a concept of wildlife acceptance capacity in wildlife management. *Wildlife Society Bulletin* 16:53-57.
- Decker, D. J., and L. C. Chase. 1997. Human dimension of living with wildlife—a management challenge for the 21st century. *Wildlife Society Bulletin* 16:53-57.
- Department of Land Acquisition and Management Planning Department, Natural Resources Department, Department of Information Technology, East Hampton Deer Management Working Group, Dominick Stanzione, Town Councilman. 2013. *Management of the White-tailed Deer Population in East Hampton Town*. East Hampton Town, NY, USA.
- DeVault, T. L., J. C. Beasley, L. A. Humberg, B. J. MacGowan, M. I. Retamosa, and O. E. Rhodes, Jr. 2007. Intrafield patterns of wildlife damage to corn and soybeans in northern Indiana. *Human-Wildlife Conflicts* 1:205-213.
- DeYoung, C. A. 2011. Population dynamics. Pages 147-180 in D. G. Hewitt, editor. *Biology and Management*

of White-tailed Deer. CRC Press. Boca Raton, Florida, USA.

- DeYoung, C. A., D. L. Drawe, T. E. Fulbright et al. 2008. Density dependence in deer populations: Relevance for management in variable environments. Pages 202-222 *in* T. E. Fulbright and D. G. Hewitt, editors. *Wildlife Science: Linking Ecological Theory and Management Applications*. CRC Press, Boca Raton, Florida, USA.
- Dolbeer, R. A., N. R. Holler, and D. W. Hawthorne. 1994. Identification and control of wildlife damage. Pages 474-506 *in* T.A. Bookhout, editor. *Research and management techniques for wildlife and habitats*. The Wildlife Society; Bethesda, Maryland, USA.
- Dolbeer, R. A. 2000. Birds and aircraft: fighting for airspace in crowded skies. *Proceedings of the Vertebrate Pest Conference* 19:37-43.
- Dolbeer, R. A., S. E. Wright, and E. C. Cleary. 2000. Ranking the hazard level of wildlife species to aviation. *Wildlife Society Bulletin* 28:372-378
- Dolbeer, R.A. 2009. Birds and aircraft: fighting for airspace in ever more crowded skies. *Human-Wildlife Conflicts* 3:165-166.
- Dolbeer, R.A., S.E. Wright, J. Weller, and M.J. Beiger. 2012. Wildlife strikes to civil aircraft in the United States, 1990–2010. U.S. Department of Transportation, Federal Aviation Administration, Office of Airport Safety and Standards, Serial Report No. 17, Washington, D.C., USA.
- Dolbeer, R.A., S.E. Wright, J. Weller, and M.J. Beiger. 2013. Wildlife strikes to civil aircraft in the United States, 1990–2012. U.S. Department of Transportation, Federal Aviation Administration, Office of Airport Safety and Standards, Serial Report No. 19, Washington, D.C., USA.
- Drake, D., J. B. Paulin, P. D. Curtis, D. J. Decker, G. J. San Julian. 2005. Assessment of negative economic impacts from deer in the Northeastern United States. Rutgers Cooperative Extension. February 2005, Volume 4, Article Number 1RIB5.
- EPA. 1992a. R.E.D. Facts: Capsaicin. <<http://archive.epa.gov/pesticides/reregistration/web/pdf/4018fact.pdf>>. Accessed 9 Nov 2015.
- EPA. 1992b. R.E.D. Facts: Putrescent whole egg solids. <<http://archive.epa.gov/pesticides/reregistration/web/pdf/4079fact.pdf>>. Accessed 9 Nov 2015.
- EPA. 2009. Pesticide fact sheet: Mammalian Gonadotropin releasing hormone (GnRH). United States Environmental Protection Agency, Office of Prevention, Pesticides, and Toxic Substances. Arlington, Virginia, USA.
- Eschtruth, A.K. and J.J. Battles. 2009. Acceleration of exotic plant invasion in a forested ecosystem by a generalist herbivore. *Conservation Biology* 23:388-399.
- Eve, J.H. 1981. Management Implications of Disease. Pages 413-423 *in* W.R. Davidson, F.A. Hays, V.F. Nettles, and F.E. Kellogg, editors. *Diseases and Parasites of White-tailed Deer*. Tall Timbers Research Station Miscellaneous Publication #7, Tallahassee, Florida, USA.
- FDA. 2003. Bird poisoning of federally protected birds. Office of Criminal Investigation 2003. <<http://www.fda.gov/ICECI/EnforcementActions/EnforcementStory/EnforcementStoryArchive/ucm0963>>

81.htm > . Accessed 7 April 2015.

- Fernandez, S. 2008. Ticked Off: Deer, Lyme Disease connected? Greenwich Post. 4 September 2008.
- Fowler, M. E., and R. E. Miller. 1999. Zoo and wild animal medicine. W.B. Saunders Co. Philadelphia, Pennsylvania, USA.
- Frost, S. 2008. Suffolk County granted \$1 million in state funding for deer fencing. Press Release. County of Suffolk. Riverhead, NY, USA.
- Gerwolls, M. K., and Labott, S. M. 1994. Adjustment to the death of a companion animal. *Anthrozoos* 7:172-187.
- Gionfriddo, J. P., J. D. Eisemann, K. J. Sullivan, R. S. Healey, L. A. Miller, K. A. Fagerstone, R. M. Engeman, and C. A. Yoder. 2009. Field test of single-injection gonadotrophin-releasing hormone immunocontraceptive vaccine in female white-tailed deer. *Wildlife Research* 36:177-184.
- Golightly, R. T. and T. D. Hofstra. 1989. Immobilization of elk with a ketamine-zylazine mix and rapid reversal with yohimbine hydrochloride. *Wildlife Society Bulletin* 17: 53-58.
- Grard, G., G. Moureau, R. N. Charrel, J. J. Lemasson, J. P. Gonzalez, P. Gallian, T. S. Gritsun, E. C. Holmes, E. A. Gould, and X. de Lamballerie. 2007. Genetic characterization of tick-borne flaviviruses: New insights into evolution, pathogenetic determinants and taxonomy. *Virology* 361: 80-92.
- Haugen, A. O. 1975. Reproductive performance of white-tailed deer in Iowa. *Journal of Mammalogy*. 56:151-159.
- Hayes, E. B. and J. Piesman. 2003. How can we prevent Lyme Disease? *The New England Journal of Medicine*. 348:2424-2430.
- Healy, W. M. 1997. Influence of deer on the structure and composition of oak forests in central Massachusetts. Pages 249-266 *In* W. J. McShea, H. B. Underwood and J. H. Rappole, editors. *The Science of overabundance: deer ecology and management*. Smithsonian Books. Washington, D.C., USA.
- Herwaldt, B. L., S. Montgomery, D. Woodhall, and E. A. Bosserman. 2012. Babesiosis Surveillance – 18 States, 2011. Center for Disease Control and Prevention Morbidity and Mortality Weekly Report 61: 505-509.
- Hygnstrom, S. E., G. W. Garabrandt, K. C. Vercauteren. 2011. Fifteen Years of Urban Deer Management: The Fontenelle Forest Experience. *Wildlife Society Bulletin* 35:126-136.
- Insurance Institute for Highway Safety. 2005. Collisions with deer. Status Report 40:4-5.
- Janis, M. 2009. Biodiversity and deer impact assessment Letchworth State Park. New York State Office of Parks, Recreation, and Historic Preservation. Biodiversity and Deer Impact Report.
- J.F. Griffin Media. Hunting and trapping participation in New York. New York Hunting and Trapping eRegulations. Retrieved from < <http://www.eregulations.com/newyork/hunting2011/hunting-trapping-participation-in-new-york/>>. Accessed 16 June 2015.
- Johnson, M. R., R. G. McLean, and D. Slate. 2009. Field operations manual for the use of immobilizing and

ethanizing Drugs. USDA, APHIS, WS Operational Support Staff, Riverdale, Maryland, USA.

- Jones, J. M. and J. H. Witham. 1990. Post-translocation survival and movements of metropolitan white-tailed deer. *Wildlife Society Bulletin* 18:434-441.
- Joseph, J. T., S. S. Roy, N. Shams, P. Visintainer, R. B. Nadelman, S. Hosur, J. Nelson, and G. P. Wormser. 2011. Babesiosis, in Lower Hudson Valley, New York, USA. *Emerging Infectious Diseases* 17:843-847.
- Keirn, G., J. Cepek, B. Blackwell, and T. DeVault. 2010. On a quest for safer skies: managing the growing threat of wildlife hazards to aviation. *The Wildlife Professional*, Summer 2010: 52-55.
- Kendall, R. J., T. E. Lacher, Jr., C. Bunck, B. Daniel, C. Driver, C. E. Grue, F. Leighton, W. Stansley, P. G. Watanabe, and M. Whitworth. 1996. An ecological risk assessment of lead shot exposure in non-waterfowl avian species: Upland game birds and raptors. *Environmental Toxicology and Chemistry* 15:4-20.
- Keyser, P. D., D. C. Guynn, H. S. Hill. 2005. Population density- physical condition relationships in white-tailed deer. *Journal of Wildlife Management* 69:356-365.
- Khoury, M. Y., J. F. Camargo, J. L. White, B. P. Backenson, A. P. Dupuis II, K. L. Escuyer, L. Kramer, K. St. George, D. Chatterjee, M. Prusinski, G. P. Wormser, and S. J. Wong. 2013. Potential role of deer tick virus in Powassan Encephalitis cases in Lyme Disease–endemic areas of New York, USA. *Emerging Infectious Diseases* 19: 1926-1933.
- Kie, J. G., R. T. Bowyer, and K. M. Stewart. 2003. Ungulates in western forests: habitat relationships, population dynamics, and ecosystem processes. Pages 296-340 *in* C. Zabel and R. Anthony, editors. *Mammal Community Dynamics in Western Coniferous Forests: Management and Conservation*. The John Hopkins University Press. Baltimore, Maryland, USA.
- Kilpatrick, H. J., A. M. LaBonte, and J. T. Seymour. 2002. A shotgun–archery deer hunt in a residential community: evaluation of hunt strategies and effectiveness. *Wildlife Society Bulletin* 30:478–486.
- Kilpatrick, H. J., A. M. Labonte, and K. C. Stafford. 2014. The relationship between deer density, tick abundance, and human cases of Lyme Disease in a residential community. *Journal of Medical Entomology* 51:777-784.
- Kilpatrick, H. J., and W. D. Walter. 1999. A controlled archery deer hunt in a residential community: cost, effectiveness, and deer recovery rates. *Wildlife Society Bulletin* 27: 115-123.
- Kriz, Nancy. 2012. Tuxedo Park program culls 100 deer from herd. *The Warwick Advertiser*. 17 February 2012.<<http://warwickadvertiser.com/apps/pbcs.dll/article?AID=/20120217/NEWS01/120219955/Tuxedo-Park-program-culls-100-deer-from-herd->>. Accessed 7 April 2015.
- Laidlaw, M. A., H. W. Mielke, G. M. Filippelli, D. L. Johnson, and C. R. Gonzales. 2005. Seasonality and children's blood lead levels: Developing a predictive model using climatic variables and blood lead data from Indianapolis, Indiana, Syracuse, New York, and New Orleans, Louisiana (USA). *Environmental Health Perspectives* 113:793-800.
- Leary, S., W. Underwood, R. Anthony, S. Cartner, D. Corey, T. Grandin, C. B. Greenacre, S. Gwaltney-Bran,

- M. A. McCrackin, R. Meyer, D. Miller, J. Shearer, and R. Yanong. 2013. AVMA Guidelines for the euthanasia of Animals: 2013 Edition. < http://works.bepress.com/cheryl_greenacre/14>. Accessed 7 April 2015.
- Lefrancois, G. R. 1999. Bereavement and grieving. Pages 552-554. *in* The Lifespan. 6th ed. Wadsworth.
- Linnell, M. A., M. R. Conover, and T. J. Ohashi. 1996. Analysis of bird strikes at a tropical airport. *Journal of Wildlife Management* 60:935-945.
- Little, S. E., D. E. Stallknecht, J. M. Lockhart, J. E. Dawson, and W. R. Davidson. 1998. Natural coinfection of a white-tailed deer (*Odocoileus virginianus*) population with three Ehrlichia spp. *Journal of Parasitology* 84: 897-901.
- Lockhart, J. M., W.R. Davidson, D. E. Stallknecht, J. E. Dawson, and S. E. Little. 1997. Natural history of Ehrlichia Chaffeensis (*Rickettsiales: Ehrlichieae*) in the peidmont physiographic province of Georgia. *Journal of Parasitology* 83:887-894.
- MacKinnon, B., R. Sowden, and S. Dudley. 2001. Sharing the skies: an aviation guide to the management of wildlife hazards. Transport Canada, Aviation Publishing Division, AARA, 5th Floor, Tower C, 330 Sparks Street, Ottawa, Ontario, K1A 0N8, Canada.
- MacLean, R.A., N.E. Matthews, D.M. Grove, E.S. Frank, J.Paul-Murphy. 2006. Surgical technique for tubal ligation in white-tailed deer (*Odocoileus virginianus*). *Journal of Zoo and Wildlife Medicine* (3):354-360.
- Marks, S. G., and J. E. Koepke. 1994. Pet attachment and generativity among young adults. *J. Psychology* 128:641.
- Matschke, G.H., D.S. DeCalesta, and J.D. Harder. 1984. Crop damage and control. Pages 647-654 *in* L.K. Halls, editor. White-tailed deer ecology and management. Stackpole Books, Harrisburg, Pa.
- McCullough, D.R. 1979. The George Reserve deer herd: population ecology of a K-selected species. University of Michigan Press, Ann Arbor, MI.
- McCullough, D. R. 1992. Concepts of large herbivore populations dynamics. *In* *Wildlife 2001: Populations*, editors. D. R. McCullough and R. H. Barrett, pages 967-984. London: Elsevier Applied Science.
- McQuiston, J. H., C. D. Paddock, R. C. Holman, and J. E. Childs. 1999. The human Ehrlichioses in the United States. *Emerging Infectious Diseases* 5:635-642.
- McLean, R.G. 1994. Wildlife diseases and humans. Pages A25-A41 *in* S. E. Hygnstrom, R. M. Timm, and G. E. Larson, editors. Prevention and control of wildlife damage. University of Nebraska Cooperative Extension, University of Nebraska- Lincoln; United States Department of Agriculture, Animal and Plant Health Inspection Service, Animal Damage Control; and Great Plains Agricultural Council, Wildlife Committee.
- McShea, W. J. and J. H. Rappole. 2000. Managing the abundance and diversity of breeding bird populations through manipulation of deer populations. *Conservation Biology* 14:1161-1170.
- McShea, W.J., H. Brian Underwood, and John H.Rappole., editors. 1997. The science of overabundance : Deer ecology and population management. Smithsonian Institution Press, Washington D.C., USA.

- Meece, Mickey. 2013. Deer Mating Season: Drivers Beware. The New York Times. 1 November 2013. <<http://www.nytimes.com/2013/11/03/automobiles/deer-mating-season-drivers-beware.html>>. Accessed 21 May 2014.
- Meyers, B. 2000. Anticipatory mourning and the human-animal bond. Pages 537-564 in Rando, Therese A. editors., Clinical dimensions of anticipatory mourning: Theory and practice in working with the dying, their loved ones, and their caregivers. Champaign, IL, US: Research Press.
- Miller, J.R. 2014. Taxpayers doling out too much dough to control deer, critics charge. Fox News. 18 January.
- Miller, L.A., B.E. Johns, and G.J. Killian. 2000. Immunocontraception of white-tailed deer with GnRH vaccine. American Journal of Reproductive Immunology 44:266-274.
- National Agricultural Statistics Service. 2012. New York Statistics. <http://www.nass.usda.gov/Statistics_by_State/New_York/index.asp>. Accessed 19 June 2015.
- National Park Service. 2011. Rock Creek Park: White-tailed Deer Management Plan/Environmental Impact Statement. Washington, D.C. <<http://parkplanning.nps.gov/projectHome.cfm?projectID=14330>>. Accessed on
- New York City Interagency Deer Task Force. First Meeting. 16 December 2014.
- New York Medical College. 2013. NYMC Examines Babesiosis. <<https://www.nymc.edu/AboutNYMC/NYMCExamines/Babesiosis.html>>. Accessed 21 May 2014.
- New York State Department of Environmental Conservation. 1980. Final Programmatic Impact Statement on Wildlife Game Species Management Program of the Department of Environmental Conservation Division of Fish and Wildlife. New York State Department of Environmental Conservation. Albany, New York.
- New York State Department of Environmental Conservation. 1994. Supplemental SEQR Findings and Decisions on the Wildlife Game Species Management Program of the Department of Environmental Conservation, Division of Fish and Wildlife. New York State Department of Environmental Conservation. Albany, New York.
- New York State Department of Environmental Conservation. 2008. 2008 Richmond County Deer Survey. NYSDEC Region 1, Long Island City, New York.
- New York State Department of Environmental Conservation. 2011a. Management plan for white-tailed deer in New York State 2012-2016. New York State Department of Environmental Conservation, Division of Fish, Wildlife, and Marine Resources, Bureau of Wildlife.
- New York State Department of Environmental Conservation. 2011b. New York State white-tailed deer harvest summary. <http://www.dec.ny.gov/docs/wildlife_pdf/2011deerrpt.pdf>. Accessed 19 June 2015.
- New York State Department of Environmental Conservation. 2012. New York State white-tailed deer harvest summary. <http://www.dec.ny.gov/docs/wildlife_pdf/2012deerrpt.pdf>. Accessed 19 June 2015.
- New York State Department of Environmental Conservation. 2013. New York State white-tailed deer harvest summary. <http://www.dec.ny.gov/docs/wildlife_pdf/2013deerrpt.pdf>. Accessed 19 June 2015.

- New York State Department of Environmental Conservation. 2014a. Hunting. <<http://www.dec.ny.gov/outdoor/hunting.html>>. Accessed 19 June 2015.
- New York State Department of Environmental Conservation. 2014b. Status of Chronic Wasting Disease (CWD). <<http://www.dec.ny.gov/animals/33220.html>>. Accessed 21 May 2014.
- New York State Department of Environmental Conservation. 2014c. White-tailed deer harvest summary. <http://www.dec.ny.gov/docs/wildlife_pdf/2014deerpt.pdf >. Accessed 4 Nov 2015.
- New York State Department of Environmental Conservation. 2015. About DEC: DEC's Mission. <<http://www.dec.ny.gov/24.html>>. Accessed.19 June 2015.
- New York State Department of Health. 2012. Communicable disease fact sheets. <<http://www.health.ny.gov/diseases/communicable/>>. Accessed 21 May 2014.
- New York State Department of Transportation. 2014. New 2009-2010 New York State airport directory. <<https://www.dot.ny.gov/divisions/operating/opdm/aviation/directories>>. Accessed 21 June 2014.
- Nielsen, L. 1988. Definitions, considerations, and guidelines for translocation of wild animals. Pages 12-49 *in* L. Nielsen, and R. D. Brown, editors. Translocation of Wild Animals. Wisconsin Humane Society, Inc. and Ceaser Kleberg Wildlife Research Institute.
- Nielsen, L. 2013. New, potentially fatal tick borne illness found in local areas. News 10 ABC. 29 July 2013. <<http://www.news10.com/story/22960347/new-potentially-fatal-tick-borne-illness-found-in-local-areas>>. Accessed 21 May 2014.
- Pagel, M. D., R. M. May, and A. R. Collie. 1991. Ecological aspects of the geographical distribution and diversity of mammalian species. *American Naturalist* 137:791-815.
- Parpan, G. 2013. Southold: Clear out so we can better hunt deer. *Suffolk Times*. September 27, 2013.
- Piatt, S. 2014. 243, 567, but not enough: N.Y. deer kill up just slightly; some areas still have too many. *New York Outdoor News*. 16 May 2014.
- Ramsey, C. W. 1968. A drop-net deer trap. *Journal of Wildlife Management* 32:187-190.
- Rawinski, T. J. 2013. Reconnaissance assessment of white-tailed deer impacts in the forests of Southold, New York. Trip Report. USDA Forest Service. Durham, New Hampshire.
- Rawinski, T. J. 2014. White-tailed deer in northeastern forests: understanding and assessing impacts. Report NA-IN-02-14. U.S. Department of Agriculture, Forest Service, Newton Square, Pennsylvania.
- Robinson, M. 1996. The potential for significant financial loss resulting from bird strikes in or around an airport. *Proceedings of the Bird Strike Committee Europe* 22:353-367.
- Romin, L. A., and J. A. Bissonette. 1996. Deer-vehicle collisions: status of state monitoring activities and mitigation efforts. *Wildlife Society Bulletin* 24:276-283.
- Roseberry, J. L., and A. Woolf. 1998. Habitat-population density relationships for white-tailed deer in Illinois. *Wildlife Society Bulletin* 26:252-258.

- Ross, C. B., and J. Baron-Sorensen. 1998. *Pet loss and human emotion: guiding clients through grief*. Accelerated Development, Inc. Philadelphia, Pennsylvania.
- Ross, P. 2013. Deer birth control: New York town plans to sterilize female deer after overpopulation leads to more car accidents, bare gardens. *Science News, Space, and Nature News*. 5 August 2013. <<http://www.isciencetimes.com/articles/5795/20130805/deer-birth-control-new-york-hastings-hudson.htm>>. Accessed 30 July 2014.
- Ruhren, S. and S.N. Handel. 2003. Herbivory constrains survival, reproduction and mutualisms when restoring nine temperate forest herbs. *Journal of the Torrey Botanical Society* 130(1):34-42.
- Sams, M. G., R. L. Lochmiller, C. W. Qualls, Jr., D. M. Leslie, Jr. and M. E. Payton. 1996. Physiological correlates of neonatal mortality in an overpopulated herd of white-tailed deer. *Journal of Mammalogy* 77:179-190.
- Schmidt, R. 1989. Animal welfare and wildlife management. *Transactions of the North American Wildlife and Natural Resources Conference* 54:468-475.
- Schmitz, O. J. and A. R. E. Sinclair. 1997. Rethinking the role of deer in forest ecosystem dynamics. Pages 201-223 *in* *The Science of overabundance: deer ecology and management*. W. J. McShea, H. B. Underwood and J. H. Rappole, editors. Smithsonian Books. Washington, DC.
- Schobert, E. 1987. Telazol use in wild and exotic animals. *Veterinary Medicine* 82:1080-1088.
- Shepstone Management Company. 2008. The economic impact of New York State deer & elk farms. New York Deer and Elk Farmers Association. <http://www.shepstone.net/NYdeer.pdf>
- Slate, D. A., R. Owens, G. Connolly, and G. Simmons. 1992. Decision making for wildlife damage management. *Transactions of the North American Wildlife and Natural Resources Conference* 7:51-62.
- Snider, James. 2003. Deer management overview; southwestern portion of Letchworth State Park. New York State Department of Environmental Conservation.
- Stansley, W., L. Widjeskog, and D. E. Roscoe. 1992. Lead contamination and mobility in surface water at trap and Skeet Ranges. *Bulletin of Environmental Contaminants and Toxicology* 49:640-647.
- State Farm. 2013. U.S. Deer-Vehicle Collisions Decline. <<http://www.multivu.com/mnr/56800-state-farm-survey-show-u-s-deer-vehicle-collisions-decline>>. Accessed 21 May 2014.
- State Farm Mutual Automobile Insurance Company. 2011. U.S. deer-vehicle collisions fall 7 percent-Mishaps most likely in November and in West Virginia. <http://www.statefarm.com/aboutus/_pressreleases/2011/october/3/us-deer-collisions-fall.asp>. Accessed 21 May 2014.
- Stewart, C. M., and N. B. Veverka. 2011. The extent of lead fragmentation observed in deer culled by sharpshooting. *Journal of Wildlife Management* 75:1462-1466.
- Swihart, R. K., P. M. Picone, A. J. DeNicola, and L. Cornicelli. 1995. Ecology of urban and suburban white-tailed deer. Pages 35-44 *in* J. B. McAninch, editor. *Urban deer-a manageable resource? Proceedings of the 1993 Symposium of the Central Section, The Wildlife Society*.

- The Wildlife Society. 2010. Final position statement: wildlife damage management. The Wildlife Society, Bethesda, Maryland, USA.
- Tilghman, N. G. 1989. Impacts of white-tailed deer on forest regeneration in northwestern Pennsylvania. *Journal of Wildlife Management* 53:524-532.
- Thorpe, J. 1996. Fatalities and destroyed civil aircraft due to bird strikes, 1912-1995. *Proceedings of the International Bird Strike Conference* 23:17-31.
- Turner, J. W., J. F. Kirkpatrick, and I. K.M. Liu. 1993. Immunocontraception in white-tailed deer. Pages 147-159 in T.J. Kreeger, technical coordinator. *Contraception in Wildlife Management*. USDA/APHIS, Technical Bulletin No. 1853.
- Ueno, M., K. Kaji, and T. Saitoh. 2010. Culling versus density effects in management of a deer population. *Journal of Wildlife Management* 74:1472-1483.
- Urbanek, R. E., C. K. Nielsen, G. A. Glowacki and T.S. Preuss. 2012. Effects of White-tailed deer (*Odocoileus virginianus* Zimm.) Herbivory in Herbaceous Plant Communities in Northeastern Illinois. *Natural Areas Journal* 32(1):6-14.
- USDA. 2003. Environmental Assessment. An integrated wildlife damage management approach for the management of white-tailed deer damage in the state of New York. USDA/APHIS/WS, New York.
- USDA. 2010. Questions and Answers: GonaCon™-Birth control for deer. United States Department of Agriculture, Animal and Plant Health Inspection Service, Wildlife Services.
- U.S. Forest Service. 2012. Research Review Number 16. Northern Research Station. Newton Square, Pennsylvania.
- USFWS. 2001. Inside Region 3: Ohio man to pay more than \$11,000 for poisoning migratory birds. Volume 4(2):5.
- USFWS. 2014. Endangered Species. Section 7 Consultation: Guidance for preparing a biological assessment. <http://www.fws.gov/midwest/endangered/section7/ba_guide.html>. Accessed 21 May 2014.
- Verret, F. 2006. White-tailed deer population estimates in the town of East Hampton, New York. Report. Wildlife Biometrics, Berkshire, New York.
- Virginia Department of Game and Inland Fisheries 2006-2015. 2007. Virginia deer management plan. VDGIF, Wildlife Division, Wildlife Information Publication No. 99-1. Richmond, Virginia.
- Wade, N. 1978a. Cattle virus escapes from P4 lab. *Science, New Series*, 202 (4365):290.
- Wade, N. 1978b. Accident and hostile citizens beset animal disease laboratory. *Science, New Series*. 202(4369):723-724.
- Waller, D. M., and W. S. Alverson. 1997. The white-tailed deer: a keystone herbivore. *Wildlife Society Bulletin*, 25:217-226.
- Warren, R. J. 1991. Ecological justification for controlling deer populations in eastern national parks. *Transactions of the 56th North American Wildlife & Natural Resources Conference*.

- Weisman, A. D. 1991. Bereavement and companion animals. *Omega: Journal of Death and Dying* 22:241-248.
- Wegner, R. 2001. Can today's hunters control deer herds? *Deer and Deer Hunting*. October 2001:121-132.
- West Virginia Division of Natural Resources. 1999. Fundamentals of deer harvest management. Cooperative Extension Service, West Virginia University, Number 806. Morgantown, West Virginia, USA.
- Wheatall, L., T. Nuttle, and E. Yerger. 2013. Indirect effects of pandemic deer overabundance inferred from caterpillar-host relations. *Conservation Biology* 27(5):1107-16.
- White, D. H., L. E. Hayes, and P.B. Bush. 1989. Case histories of wild birds killed intentionally with famphur in Georgia and West Virginia. *Journal of Wildlife Diseases* 25:144-188.
- Williams, S.C., A. J. Denicola, T. Almendinger, J. Maddock. 2013. Evaluation of organized hunting as a management technique for overabundant white-tailed deer in suburban landscapes. *Wildlife society Bulletin* 37(1) 137-145.
- Wyoming County Sheriff's Office. Complaint Summary Report: Deer MVA's (motor vehicle accidents) in Genesee Falls 10/9/2003-10/8/2008.
- Wright, S. E., R. A. Dolbeer, and A. J. Montoney. 1998. Deer on airports: an accident waiting to happen. *Proceedings of the Vertebrate Pest Conference* 18:90-95.
- Zasloff, R. L. 1996. Human-animal interactions. Special Issue. *Applied Animal Behaviour Science* 47:43-48.

APPENDIX B

METHODS AVAILABLE FOR RESOLVING OR PREVENTING WHITE-TAILED DEER DAMAGE IN NEW YORK

The most effective approach to resolving wildlife damage problems is to integrate the use of several methods, either simultaneously or sequentially. An adaptive plan integrate and applies practical methods of prevention and reduces damage by wildlife while minimizing harmful effects of damage reduction measures on humans, other species, and the environment. An adaptive plan may incorporate resource management, physical exclusion and deterrents and population management, or any combination of these, depending on the characteristics of specific damage problems.

In selecting damage management techniques for specific damage situations, consideration would be given to the responsible species and the magnitude, geographic extent, duration and frequency, and likelihood of wildlife damage. Consideration would also be given to the status of target and potential non-target species, local environmental conditions and impacts, social and legal aspects, and relative costs of damage reduction options. The cost of damage reduction may sometimes be a secondary concern because of the overriding environmental, legal, and animal welfare considerations. Those factors would be evaluated in formulating damage management strategies that incorporate the application of one or more techniques.

A variety of methods would potentially be available to the WS program in New York relative to the management or reduction of damage from white-tailed deer. Various federal, state, and local statutes and regulations and WS directives would govern WS' use of damage management methods. Wildlife Services would develop and recommend or implement strategies based on resource management, physical exclusion, and wildlife management approaches. Within each approach there may be available a number of specific methods or techniques. The following methods would be recommended or used by the WS program in New York. Many of the methods described would also be available to other entities in the absence of any involvement by WS.

Non-chemical Wildlife Damage Management Methods

Non-chemical management methods consist primarily of tools or devices used to repel, capture, or kill a particular animal or local population of wildlife to alleviate damage and conflicts. Methods may be non-lethal (*e.g.*, fencing, frightening devices) or lethal (*e.g.*, firearms). If WS' personnel apply those methods, a MOU, cooperative service agreement, or other similar document must be signed by the landowner or administrator authorizing the use of each damage management method. Non-chemical methods used or recommended by WS include:

Exclusion pertains to preventing access to resources through fencing or other barriers. Fencing of small critical areas can sometimes prevent animals that cannot climb from entering areas of protected resources. Electric fences of various constructions have been used effectively to reduce damage to various crops by deer, raccoons, and other species (Boggess 1994, Craven and Hygnstrom 1994).

Cultural Methods and Habitat Management include the application of practices that seek to minimize exposure of the protected resource to damaging animals through processes other than exclusion. They may

include animal husbandry practices such as employing guard dogs. Strategies may also include minimizing cover where damaging white-tailed deer might hide, manipulating the surrounding environment through barriers or fences to deter animals from entering a protected area, or planting lure crops on fringes of protected crops. Ornamental flowers and shrubs less palatable to deer may be planted.

Supplemental feeding is sometimes used to reduce damage by wildlife, such as lure crops. Food is provided so that the animal causing damage consumes that food rather than the resource being protected. In feeding programs, target wildlife are offered an alternative food source with a higher appeal with the intention of luring them from feeding on affected resources. A state permit would be required to intentionally feed deer.

Animal behavior modification refers to tactics that deter or repel damaging white-tailed deer and thus, reduce damage to the protected resource. Those techniques are usually aimed at causing target animals to respond by fleeing from the site or remaining at a distance. They usually employ extreme noise or visual stimuli. Unfortunately, many of these techniques are only effective for a short time before wildlife habituate to them (Conover 1982). Devices used to modify behavior in white-tailed deer include electronic guards (siren strobe-light devices), propane exploders, pyrotechnics, human effigies, and effigies of predators.

Live Capture and Translocation can be accomplished by using live capture devices including, but not limited to, drop nets (Ramsey 1968), drive nets (Beasom et al. 1980), and remote delivery darting with immobilizing drugs (Golightly and Hofstra 1989), and other methods approved by the NYSDEC to capture white-tailed deer for the purpose of translocating them for release in other areas. Wildlife Services would employ those methods in New York when the target animal(s) can legally be translocated or can be captured and handled with relative safety by WS personnel. Live capture and handling of white-tailed deer poses an additional level of human health and safety threat if target animals are aggressive, large, or extremely sensitive to the close proximity of humans. For that reason, WS may limit this method to specific situations. In addition, moving damage-causing individuals to other locations can typically result in damage at the new location, or the translocated individuals can move from the relocation site to areas where they are unwanted. In addition, translocation can facilitate the spread of diseases from one area to another. The AVMA, the National Association of State Public Health Veterinarians, and the Council of State and Territorial Epidemiologists all oppose the relocation of white-tailed deer because of the risk of disease transmission (CDC 1990). Although translocation is not necessarily precluded in all cases, it would be logistically impractical, in most cases, and biologically unwise in New York due to the risk of disease transmission. High population densities of some animals may make this a poor wildlife management strategy for those species. Translocation would be evaluated by WS on a case-by-case basis. Translocation would only occur with the prior authorization of the NYSDEC and when part of an approved plan to restore or reintroduce deer.

Live Capture and Euthanasia can be accomplished by using live capture devices including, but not limited to, drop nets, drive nets, or remote delivery darts with immobilizing drugs, and other methods approved by the NYSDEC. Following live capture, WS would administer one of the euthanizing pesticides mentioned in the Chemical Wildlife Damage Management Methods section below or use other methods approved by the AVMA such as gun shot or captive bolt (Leary et al. 2013).

Shooting with firearms is very selective for the target species and would be conducted with rifles, handguns, and shotguns. Methods and approaches used by WS may include use of vehicles, illuminating devices, bait, firearm suppressors, night vision/thermal equipment, and elevated platforms. Shooting is an effective method in some

circumstances, and can often provide immediate relief from the problem. Shooting may at times be one of the only methods available to effectively and efficiently resolve a wildlife problem.

Ground shooting is sometimes used as the primary method to alleviate damage or threats of damage. Shooting would be limited to locations where it is legal and safe to discharge a firearm. A shooting program, especially conducted alone, can be expensive because it often requires many staff hours to complete.

Shooting can also be used in conjunction with an illumination device at night, which is especially useful for white-tailed deer. Spotlights may or may not be covered with a red lens, which nocturnal animals may not be able to see, making it easier to locate them undisturbed. Night shooting may be conducted in sensitive areas that have high public use or other activity during the day, which would make daytime shooting unsafe. The use of night vision and Forward Looking Infrared (FLIR) devices can also be used to detect and shoot white-tailed deer at night, and is often the preferred equipment due to the ability to detect and identify animals in complete darkness. Night vision and FLIR equipment aid in locating wildlife at night when wildlife may be more active. Night vision and FLIR equipment would be used during surveys and in combination with shooting to remove target white-tailed deer at night. Wildlife Services personnel most often use this technology to target white-tailed deer in the act of causing damage or likely responsible for causing damage. This method aid in the use of other methods or allows other methods to be applied more selectively and efficiently. Night vision and FLIR equipment allow for the identification of target species during night activities, which reduces the risks to non-targets and reduces human safety risks. Night vision equipment and FLIR devices only aid in the identification of wildlife and are not actual methods of harvest. The use of FLIR and night vision equipment to remove target white-tailed deer would increase the selectivity of direct management activities by targeting those white-tailed deer most likely responsible for causing damage or posing threats.

Hunting: WS sometimes recommends that resource owners consider legal hunting as an option for reducing white-tailed deer damage. Legal hunting can be used to reduce some populations of white-tailed deer, and is very low cost for the landowners. However, hunter interest and desired deer population levels must be evaluated when considering this option.

Hunter interest, few sanctuaries for deer, and hunter access are crucial to the success of a hunting based management plan, but hunting restrictions in urban and suburban areas are commonplace and can lead to deer overpopulation (Williams et al. 2013). In addition to hunting access restrictions, the number of hunting license buyers in the state of New York has decreased roughly 1 percent per year since 1984 (J. F. Griffin Media), and this decline in hunter numbers makes it difficult to rely on hunting as a sole strategy for deer management (Wegner 2001). In New York, the 2013-2014 hunting season did not produce the desired antlerless harvest in some regions of the state. Although there are appropriate numbers of antlerless deer in some parts of the state due to the efficacy of legal hunting, in a few parts of the state there are still more deer than desired (Piatt 2014).

Studies have shown that hunting reduces deer herd size (Kilpatrick and Walter 1999); however, regulated hunting might not be sufficient to maintain low deer densities in all areas. Williams et al. (2013) found that the combined use of traditional hunting, organized hunts, and modified hunting regulations (including extended archery seasons, hunting over bait, unlimited harvest numbers) led to a decrease in density of white-tailed deer. Hunting was able to reduce the density of deer from very high levels to 17 deer/ square kilometer (44 deer/square mile) (Williams et al. 2013). Once this density was reached there was a decline in interest of hunters which was likely associated

with fewer shot opportunities and the unintentional education of deer to hunter threats (Williams et al. 2013). If hunting is to be used as a management technique, Williams et al. (2013) suggests taking measures to recruit highly skilled hunters, ensure that hunters receive better training, and modify regulations to allow more opportunities to remove deer.

Sterilization: Sterilization is accomplished through: 1) surgical sterilization (vasectomy, castration, ovariectomy, and tubal ligation), 2) chemosterilization, and 3) through gene therapy. Experimental surgical sterilization studies have been conducted on white-tailed deer populations in certain towns in New York. Field studies have shown that the process is expensive, averaging over \$1,000 per deer, and the efficacy and practicality of these surgical sterilization processes have not yet been established (Boulanger et al 2012). Cayuga Heights, NY, spent over \$35,000 at the end of 2013 on sterilizations, and spent \$148,000 the year before. Following this project, surveys still estimated 125 deer per square mile, well over recommended populations levels of no more than 20 deer per square mile (Miller 2014). Additionally, attempts at surgical sterilizations, although considered more humane by some, may still result in some deer mortality (MacLean et al. 2006). MacLean et al. (2006) conducted a project in which deer underwent surgical tubal ligation, and the projects efforts resulted in 11 deaths out of 181 individuals.

Chemical Wildlife Damage Management Methods

All pesticides used by WS are registered under the FIFRA and administered by the EPA and NYSDEC Bureau of Pesticides Management. All WS personnel in New York who apply restricted-use pesticides would be certified pesticide applicators by NYSDEC Bureau of Pesticides Management and have specific training by WS for pesticide application. The EPA and the NYSDEC Bureau of Pesticides Management require pesticide applicators to adhere to all certification requirements set forth in the FIFRA. Pharmaceutical drugs, including those used in wildlife capture and handling, are administered by FDA and/or DEA.

Chemicals would not be used by WS on public or private lands without authorization from the land management agency or property owner or manager. The following chemical methods have been proven to be selective and effective in reducing damage by white-tailed deer.

Ketamine (Ketamine HCl) is a dissociative anesthetic that is used to capture wildlife, primarily mammals, birds, and reptiles. It is used to eliminate pain, calms fear, and allay anxiety. Ketamine is possibly the most versatile drug for chemical capture, and it has a wide safety margin (Fowler and Miller 1999). When used alone, this drug may produce muscle tension, resulting in shaking, staring, increased body heat, and, on occasion, seizures. Usually, ketamine is combined with other drugs such as xylazine. The combination of such drugs is used to control an animal, maximize the reduction of stress and pain, and increase human and animal safety.

Xylazine is a sedative (analgesic) that calms nervousness, irritability, and excitement, usually by depressing the central nervous system. Xylazine is commonly used with ketamine to produce a relaxed anesthesia. It can also be used alone to facilitate physical restraint. Because xylazine is not an anesthetic, sedated animals are usually responsive to stimuli. Therefore, personnel should be even more attentive to minimizing sight, sound, and touch. When using ketamine/xylazine combinations, xylazine will usually overcome the tension produced by ketamine, resulting in a relaxed, anesthetized animal (Fowler and Miller 1999). This reduces heat production from muscle tension, but can lead to lower body temperatures when working in cold conditions.

Telazol is a more powerful anesthetic and usually used for larger animals. Telazol is a combination of equal parts of tiletamine hydrochloride and zolazepam hydrochloride (a tranquilizer). The product is generally supplied sterile in vials, each containing 500 mg of active drug, and when dissolved in sterile water has a pH of 2.2 to 2.8. Telazol produces a state of unconsciousness in which protective reflexes, such as coughing and swallowing, are maintained during anesthesia. Schobert (1987) listed the dosage rates for many wild and exotic animals. Before using Telazol, the size, age, temperament, and health of the animal are considered. Following a deep intramuscular injection of Telazol, onset of anesthetic effect usually occurs within 5 to 12 minutes. Muscle relaxation is optimum for about the first 20 to 25 minutes after the administration, and then diminishes. Recovery varies with the age and physical condition of the animal and the dose of Telazol administered, but usually requires several hours.

BAM is an anesthetic drug comprised of butorphanol tartrate, azaperone tartrate and medetomidine hydrochloride. It is used to immobilize a broad range of species. All three of these pharmaceuticals seem to bring the best attributes of each at the lowest effective dose rate. BAM provides smooth induction times equal to or shorter than Telazol and Xylazine as well as quick reversal times of 5-10 minutes. This drug could be used by Wildlife Services upon approval of the program's Chemical Immobilization and Euthanasia Committee.

Sodium Pentobarbital is a barbiturate that rapidly depresses the central nervous system to the point of respiratory arrest. Barbiturates are a recommended euthanasia drug for free-ranging wildlife (Leary et al. 2013). Sodium Pentobarbital would only be administered after deer have been live-captured and properly immobilized to allow for direct injection. There are DEA restrictions on who can possess and administer this drug. Some states may have additional requirements for personnel training and particular sodium pentobarbital products available for use in wildlife. Certified WS' personnel are authorized to use sodium pentobarbital and dilutions for euthanasia in accordance with DEA and state regulations.

Potassium Chloride used in conjunction with prior general anesthesia is used as a euthanasia agent for animals, and is considered acceptable and humane by the AVMA (2007). Animals that have been euthanized with this chemical experience cardiac arrest followed by death, and are not toxic to predators or scavengers.

Beuthanasia-D combines pentobarbital with another substance to hasten cardiac arrest.

Intravenous (IV) and intracardiac (IC) are the only acceptable routes of injection. As with pure sodium pentobarbital, IC injections with Beuthanasia-D are only acceptable for animals that are unconscious or deeply anesthetized. With other injection routes, there are concerns that the cardiotoxic properties may cause cardiac arrest before the animal is fully unconscious. It is a Schedule III drug, which means it can be obtained directly from the manufacturer by anyone with a DEA registration. However, Schedule III drugs are subject to the same security and record-keeping requirements as Schedule II drugs.

Fatal-Plus® combines pentobarbital other substances to hasten cardiac arrest. IV is the preferred route of injection; however, IC is acceptable as part of the two-step procedure used by WS. Animals are first anesthetized and sedated using a combination of ketamine/xylazine and once completely unresponsive to stimuli and thoroughly sedated, Fatal-Plus® is administered. Like Beuthanasia-D, it is a Schedule III drug requiring a DEA registration for purchase and is subject to the security and record-keeping requirements of Schedule II drugs.

Repellents are usually naturally occurring substances or chemicals formulated to be distasteful or to elicit pain or discomfort for target animals when they are smelled, tasted, or contacted. Only a few repellents are commercially available for white-tailed deer, and are registered for only a few species. Repellents are not available for many species that may present damage problems, such as some predators or furbearing species. Repellents are variably effective and depend largely on resource to be protected, time and length of application, and sensitivity of the species causing damage. Again, acceptable levels of damage control are usually not realized unless repellents are used in conjunction with other techniques.

GonaCon™ was developed by scientists with the NWRC as a reproductive inhibitor. GonaCon™ is a new single dose immunocontraceptive vaccine. Recent studies have demonstrated the efficacy of this single-shot Gonadotropin-releasing hormone (GnRH) vaccine on California ground squirrels, Norway rats, feral cats and dogs, feral swine, wild horses, and white-tailed deer. Infertility among treated female swine and white-tailed deer has been documented for up to two years without requiring a booster vaccination (Miller et al. 2000). This vaccine overcomes one of the major obstacles of previous two dose vaccines since target wildlife need to be captured only once for vaccination instead of twice. A single-injection vaccine would be much more practical as a field delivery system for use on free-ranging animals.

GonaCon™ was officially registered by the EPA in 2009 for use in reducing fertility in female white-tailed deer under EPA registration number 56228-40. GonaCon™ is registered as a restricted-use pesticide available for use by WS' personnel and personnel of a state wildlife management agency or persons under their authority. Additionally, in order for GonaCon™ to be used in any given state, the product must also be registered with the state and approved for use by the appropriate state agency responsible for managing wildlife. GonaCon™, when injected into the body, elicits an immune response that neutralizes the GnRH hormone being produced naturally by deer. The GnRH hormone in deer stimulates the production of other sexual hormones, which leads to the body reaching a reproductive state. The vaccine neutralizes the GnRH hormone being produced, which then prevents the production of other sexual hormones in the deer vaccinated; thereby, preventing the body of the deer from entering into a reproductive state (USDA 2010).

4-Poster Tickicide (EPA registration number 39039-12) is a pesticide product used for the control of deer ticks and lone star ticks. This device consists of a large central container that is filled with corn which is dispensed in close proximity to rollers that are covered with the pesticide permethrin. Deer come into contact with the rollers while feeding, and the pesticide is then dispersed onto them. The feeding of wild deer in New York State requires a valid 6 NYCRR Part 189 permit. This product is classified as "Restricted Use" in New York State.

APPENDIX C

STATE AND FEDERAL THREATENED AND ENDANGERED SPECIES

Species Listed by the State of New York as Endangered:

	<u>Common Name</u>	<u>Scientific Name</u>
Mollusks	¹ Dwarf Wedgemussel	<i>Alasmidonta heterodon</i>
	¹ Pink mucket	<i>Lampsilis abrupta</i>
	¹ Clubshell	<i>Pleurobema clava</i>
	¹ Fat pocketbook	<i>Potamilus capax</i>
	Rayed Bean	<i>Villosa fabalis</i>
	² Chittenango Ovate Amber Snail	<i>Novisuccinea chittenangoensis</i>
Insects	Tomah Mayfly	<i>Siphonisca aerodromia</i>
	^{1,3} American Burying Beetle	<i>Nicrophorus americanus</i>
	Hessel's Hairstreak	<i>Callophrys hesseli</i>
	¹ Karner Blue Butterfly	<i>Lycaeides melissa samuelis</i>
	Regal Fritillary	<i>Speyeria idalia</i>
	Persius Duskywing	<i>Erynnis persius</i>
	Grizzled Skipper	<i>Pyrgus centaureae wyandot</i>
	Arogos Skipper	<i>Atrytone arogos arogos</i>
	Bog Buckmoth	<i>Hemileuca species 1</i>
	Pine Pinion Moth	<i>Lithophane lepida lepida</i>
Fishes	¹ Shortnose Sturgeon	<i>Acipenser brevirostrum</i>
	³ Silver Chub	<i>Macrhybopsis storeriana</i>
	Pugnose Shiner	<i>Notropis anogenus</i>
	Round Whitefish	<i>Prosopium cylindraceum</i>
	Bluebreast Darter	<i>Etheostoma camurum</i>
	³ Gilt Darter	<i>Percina evides</i>
	³ Spoonhead Sculpin	<i>Cottus ricei</i>
	Deepwater Sculpin	<i>Myoxocephalus thompsoni</i>
Amphibians	Tiger Salamander	<i>Ambystoma tigrinum</i>
	Northern Cricket Frog	<i>Acris crepitans</i>
Reptiles	Mud Turtle	<i>Kinosternon subrubrum</i>
	² Bog Turtle	<i>Clemmys muhlenbergii</i>
	¹ Atlantic Hawksbill Sea Turtle	<i>Eretmochelys imbricata</i>
	¹ Atlantic Ridley Sea Turtle	<i>Lepidochelys kempii</i>
	¹ Leatherback Sea Turtle	<i>Dermochelys coriacea</i>
	Queen Snake	<i>Regina septemvittata</i>
	Massasauga	<i>Sistrurus catenatus</i>
Birds	Spruce Grouse	<i>Falcapennis canadensis</i>
	³ Golden Eagle	<i>Aquila chrysaetos</i>
	Peregrine Falcon	<i>Falco peregrinus</i>

	Black Rail	<i>Laterallus jamaicensis</i>
	^{1,2,4} Piping Plover	<i>Charadrius melodus</i>
	^{1,3} Eskimo Curlew	<i>Numenius borealis</i>
	¹ Roseate Tern	<i>Sterna dougallii dougallii</i>
	Black Tern	<i>Chlidonias niger</i>
	Short-eared Owl	<i>Asio flammeus</i>
	Loggerhead Shrike	<i>Lanius ludovicianus</i>
Mammals	¹ Indiana Bat	<i>Myotis sodalis</i>
	³ Allegheny Woodrat	<i>Neotoma magister</i>
	¹ Sperm Whale	<i>Physeter catodon</i>
	¹ Sei Whale	<i>Balaenoptera borealis</i>
	¹ Blue Whale	<i>Balaenoptera musculus</i>
	¹ Finback Whale	<i>Balaenoptera physalus</i>
	¹ Humpback Whale	<i>Megaptera novaeangliae</i>
	¹ Right Whale	<i>Eubalaena glacialis</i>
	^{1,3} Gray Wolf	<i>Canis lupus</i>
	^{1,3} Cougar	<i>Felis concolor</i>
Plants	Sandplain Gerardia	<i>Agalinis acuta</i>

¹Currently listed as "endangered" by the U. S. Department of the Interior.

²Currently listed as "threatened" by the U. S. Department of the Interior.

³Species is extirpated from New York State.

⁴Piping Plover is listed as federally endangered in the Great Lakes Region, and as federally threatened in the Atlantic Coastal Region.

Species Listed in the State of New York as Threatened:

	<u>Common Name</u>	<u>Scientific Name</u>
Molluscs	Brook Floater	<i>Alasmidonta varicosa</i>
	Wavy-rayed Lampmussel	<i>Lampsilis fasciola</i>
	Green Floater	<i>Lasmigona subviridis</i>
Insects	Pine Barrens Bluet	<i>Enallagma recurvatum</i>
	Scarlet Bluet	<i>Enallagma pictum</i>
	Little Bluet	<i>Enallagma minisculum</i>
	^{2,3} Northeastern Beach Tiger Beetle	<i>Cicindela dorsalis dorsalis</i>
	Frosted Elfin	<i>Callophrys irus</i>
Fishes	Lake Sturgeon	<i>Acipenser fulvescens</i>
	Mooneye	<i>Hiodon tergisus</i>
	³ Lake Chubsucker	<i>Erimyzon sucetta</i>
	Gravel Chub	<i>Erimystax x-punctata</i>
	³ Mud Sunfish	<i>Acantharchus pomotis</i>
	Banded Sunfish	<i>Enneacanthus obesus</i>
	Longear Sunfish	<i>Lepomis megalotis</i>
	⁴ Longhead Darter	<i>Percina macrocephala</i>
	Eastern Sand Darter	<i>Ammocrypta pellucida</i>

	Swamp Darter	<i>Etheostoma fusiforme</i>
	Spotted Darter	<i>Etheostoma maculatum</i>
Amphibians	None Listed	---
Reptiles	Blanding's Turtle	<i>Emydoidea blandingii</i>
	² Green Sea Turtle	<i>Chelonia mydas</i>
	² Loggerhead Sea Turtle	<i>Caretta caretta</i>
	Fence Lizard	<i>Sceloporus undulatus</i>
	Timber Rattlesnake	<i>Crotalus horridus</i>
Birds	Pied-billed Grebe	<i>Podilymbus podiceps</i>
	Least Bittern	<i>Ixobrychus exilis</i>
	Bald Eagle	<i>Haliaeetus leucocephalus</i>
	Northern Harrier	<i>Circus cyaneus</i>
	King Rail	<i>Rallus elegans</i>
	Upland Sandpiper	<i>Bartramia longicauda</i>
	Common Tern	<i>Sterna hirundo</i>
	Least Tern	<i>Sterna antillarum</i>
	Sedge Wren	<i>Cistothorus platensis</i>
	Henslow's Sparrow	<i>Ammodramus henslowii</i>
Mammals	^{2,3} Canada Lynx	<i>Lynx canadensis</i>
Plants	Northern wild monk's-hood	<i>Aconitum noveboracense</i>
	Seabeach amaranth	<i>Amaranthus pumilus</i>
	Hart's-tongue fern	<i>Asplenium scolopendrium</i> var. <i>americanum</i>
	Leedy's roseroot	<i>Sedum integrifolium</i> ssp. <i>leedyi</i>
	Houghton's goldenrod	<i>Solidago houghtonii</i>

¹Currently listed as "endangered" by the U. S. Department of the Interior.

²Currently listed as "threatened" by the U. S. Department of the Interior.

³Species is extirpated from New York State.

⁴Piping Plover is listed as federally endangered in the Great Lakes Region, and as federally threatened in the Atlantic Coastal Region.

Federally Listed, Proposed, and Candidate Endangered and Threatened Species in New York:

	<u>Common Name</u>	<u>Scientific Name</u>	<u>Status</u>
Fishes	Atlantic sturgeon*	<i>Acipenser oxyrinchus oxyrinchus</i>	E
	Shortnose sturgeon*	<i>Acipenser brevirostrum</i>	E
Reptiles	Bog turtle	<i>Clemmys [=Glyptemys] muhlenbergii</i>	T
	Eastern massasauga rattlesnake	<i>Sistrurus catenatus catenatus</i>	C
	Green turtle*	<i>Chelonia mydas</i>	T
	Hawksbill turtle*	<i>Eretmochelys imbricata</i>	E
	Kemp's ridley turtle*	<i>Lepidochelys kempii</i>	E
	Leatherback turtle*	<i>Dermochelys coriacea</i>	E
	Loggerhead turtle*	<i>Caretta caretta</i>	T

Birds	Bald eagle	<i>Haliaeetus leucocephalus</i>	D
	Piping plover	<i>Charadrius melodus</i>	E, T, CH ₁
	Red knot	<i>Calidris canutus rufa</i>	PT
	Roseate tern	<i>Sterna dougallii dougallii</i>	E
Mammals	Blue whale*	<i>Balaenoptera musculus</i>	E
	Finback whale*	<i>Balaenoptera physalus</i>	E
	Humpback whale*	<i>Megaptera novaeangliae</i>	E
	Indiana bat	<i>Myotis sodalis</i>	E
	New England cottontail rabbit	<i>Sylvilagus transitionalis</i>	C
	North Atlantic right whale*	<i>Eubalaena glacialis</i>	E
	Northern long-eared bat	<i>Myotis septentrionalis</i>	PE
	Sei whale*	<i>Balaenoptera borealis</i>	E
	Sperm whale*	<i>Physeter catodon</i>	E
Mollusks	Chittenango ovate amber snail	<i>Novisuccinea chittenangoensis</i>	T
	Clubshell mussel	<i>Pleurobema clava</i>	E
	Dwarf wedgemussel	<i>Alasmidonta heterodon</i>	E
	Rayed bean mussel	<i>Villosa fabalis</i>	E
Butterflies	Karner blue butterfly	<i>Lycaeides melissa samuelis</i>	E
Plants	American hart's-tongue fern	<i>Asplenium scolopendrium</i> var. <i>americana</i>	T
	Eastern prairie fringed orchid	<i>Platanthera leucophea</i>	T (H)
	Houghton's goldenrod	<i>Solidago houghtonii</i>	T
	Leedy's roseroot	<i>Rhodiola integrifolium</i> ssp. <i>leedyi</i>	T
	Northeastern bulrush	<i>Scirpus ancistrochaetus</i>	E
	Northern wild monkshood	<i>Aconitum noveboracense</i>	T
	Sandplain gerardia	<i>Agalinis acuta</i>	E
	Seabeach amaranth	<i>Amaranthus pumilus</i>	T
	Small whorled pogonia	<i>Isotria medeoloides</i> (<i>Sedum integrifolium</i> ssp. <i>L</i>)	T
	Swamp pink	<i>Helonias bullata</i>	T (H)

E=endangered, T= threatened, P = proposed, H = historic, C = candidate, D = delisted, CH = critical habitat

*Except for sea turtle nesting habitat, principal responsibility for these species is vested with the NOAA-Fisheries.

1Critical habitat has been designated for the Great Lakes Breeding Population of the piping plover.

APPENDIX D

AUTHORITY AND COMPLIANCE

I. AUTHORITIES

The authorities of WS and other agencies as those authorities relate to conducting wildlife damage management activities are discussed by agency below:

WS' Legislative Authorities

The primary statutory authorities for WS' program are the Act of March 2, 1931 (46 Stat. 1468; 7 USC 426-426b) as amended, and the Act of December 22, 1987 (101 Stat. 1329-331, 7 USC 426c). The WS program is the lead federal authority in managing damage to agricultural resources, natural resources, property, and threats to human safety associated with wildlife. Wildlife Services' directives define program objectives and guide WS' activities to manage wildlife damage management.

NYS Department of Environmental Conservation

The New York State Department of Environmental Conservation (NYSDEC) was created on July 1, 1970 to combine into a single agency all state programs designed to protect and enhance the environment. NYSDEC has statutory authority pursuant to the New York State Environmental Conservation Law (ECL) Article 11 and 13, and their mission is: "To conserve, improve and protect New York's natural resources and environment and to prevent, abate and control water, land and air pollution, in order to enhance the health, safety and welfare of the people of the state and their overall economic and social well-being" (NYSDEC 2015).

In October 2012, NYSDEC adopted the Management Plan for White-tailed Deer in New York State, 2012-2016. The Deer Management Plan describes six primary goals that encompass the current priorities for deer management and the values and issues expressed by the public: 1) manage deer populations at levels that are appropriate for human and ecological concerns; 2) promote and enhance deer hunting as an important recreational activity, tradition and management tool in New York; 3) reduce the negative impacts caused by deer; 4) foster understanding and communication about deer ecology, management, economic aspects and recreational opportunities while enhancing NYSDEC'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 (NYSDEC 2011*a*).

Additionally, NYSDEC's wildlife management activities and their impacts are described in the Final Programmatic Impact Statement on Wildlife Game Species Management Program of the Department of Environmental Conservation, Division of Fish and Wildlife (NYSDEC 1980) and reiterated in the Supplemental SEQR Findings and Decisions (NYSDEC 1994).

NYS Department of Agriculture and Markets

The Department of Agriculture and Markets (NYSDAM) carries out the Agriculture and Markets Law, the Soil and Water Conservation Law, and executes inspections for the United States Department of Agriculture and Food and Drug Administration. Its mission is to foster a competitive New York State food and agriculture industry to benefit producers and consumers. The Division of Food Safety and Inspection is the Department's largest Division, with a staff of approximately 200 full-time employees including about 115 food inspectors. The Division has jurisdiction over approximately 28,000 food handling establishments.

The goals of the Department are to:

1. Encourage economic development in the State's agricultural and food industry;
2. Assure consumer safety and protection with relation to food, milk, and other commodities sold in the State;
3. Encourage the appropriate use of agricultural resources to protect the environment and preserve productive agricultural land.

United States Environmental Protection Agency

The EPA is responsible for implementing and enforcing the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), which regulates the registration and use of pesticides. The EPA is also responsible for administering and enforcing the Section 404 program of the Clean Water Act with the United States Army Corps of Engineers; this established a permit program for the review and approval of water quality standards that directly affect wetlands.

United States Food and Drug Administration

Federal Food, Drug, and Cosmetic Act (21 U.S.C. 360). This law places administration of pharmaceutical drugs, including those used in wildlife capture and handling, under the Food and Drug Administration.

II. COMPLIANCE

Several laws or statutes authorize, regulate, or otherwise would affect WS' activities. Wildlife Services would comply with those laws and statutes and would consult with other agencies as appropriate. Wildlife Services would comply with all applicable federal, State, and local laws and regulations in accordance with WS Directive 2.210. Those laws and regulations related to activities conducted to reduce white-tailed deer damage in the State are addressed below:

National Environmental Policy Act

All federal actions are subject to the NEPA (Public Law 9-190, 42 USC 4321 et seq.). Wildlife Services follows CEQ regulations implementing the NEPA (40 CFR 1500 et seq.) along with USDA (7 CFR 1b) and APHIS Implementing Guidelines (7 CFR 372) as part of the decision-making process. These laws, regulations, and guidelines generally outline five broad types of activities to be accomplished as part of any project: public involvement, analysis, documentation, implementation, and monitoring. The NEPA also sets forth the

requirement that all major federal actions be evaluated in terms of their potential to significantly affect the quality of the human environment for the purpose of avoiding or, where possible, mitigating and minimizing adverse impacts. Federal activities affecting the physical and biological environment are regulated in part by CEQ through regulations in 40 CFR, Parts 1500-1508. In accordance with CEQ and USDA regulations, APHIS guidelines concerning Implementation of the NEPA Procedures, as published in the Federal Register (44 CFR 50381-50384) provide guidance to APHIS regarding the NEPA process.

Pursuant to the NEPA and CEQ regulations, this EA documents the analyses resulting from proposed federal actions, informs decision-makers and the public of reasonable alternatives capable of avoiding or minimizing adverse impacts, and serves as a decision-aiding mechanism to ensure that the policies and goals of the NEPA are infused into federal agency actions. This EA was prepared by integrating as many of the natural and social sciences as warranted, based on the potential effects of the proposed action. The direct, indirect, and cumulative impacts of the alternatives are analyzed.

Endangered Species Act

Under the ESA, all federal agencies will seek to conserve T&E species and will utilize their authorities in furtherance of the purposes of the Act (Sec.2(c)). Wildlife Services conducts Section 7 consultations with the USFWS to use the expertise of the USFWS to ensure that "*any action authorized., funded or carried out by such an agency . . . is not likely to jeopardize the continued existence of any endangered or threatened species . . . Each agency will use the best scientific and commercial data available*" (Sec.7 (a) (2)). Evaluation of the alternatives in regards to the ESA will occur in Chapter 4 of this EA.

Federal Insecticide, Fungicide, and Rodenticide Act

The FIFRA requires the registration, classification, and regulation of all pesticides used in the United States. The EPA is responsible for implementing and enforcing the FIFRA. All chemical methods used or recommended by the WS' program in New York would be registered with and regulated by the EPA and the NYS DAM would be used by WS in compliance with labeling procedures and requirements.

National Historic Preservation Act of 1966, as Amended

The NHPA and its implementing regulations (36 CFR 800) require federal agencies to initiate the section 106 process if an agency determines that the agency's actions are undertakings as defined in Sec. 800.16(y) and, if so, whether it is a type of activity that has the potential to cause effects on historic properties. If the undertaking is a type of activity that does not have the potential to cause effects on historic properties, assuming such historic properties were present, the agency official has no further obligations under section 106. None of the white-tailed deer damage management methods described in this EA that might be used operationally by WS would cause major ground disturbance, any physical destruction or damage to property, any alterations of property, wildlife habitat, or landscapes, nor involves the sale, lease, or transfer of ownership of any property. In general, such methods also do not have the potential to introduce visual, atmospheric, or audible elements to areas in which they are used that would result in effects on the character or use of historic properties. Therefore, the methods that would be used by WS under the alternatives would not generally be the types of activities that would have the potential to affect historic properties. If an individual activity with the potential to affect historic resources were

planned under an alternative selected because of a decision on this EA, the site-specific consultation as required by Section 106 of the NHPA would be conducted as necessary.

Noise-making methods, such as firearms, that are used at or in close proximity to historic or cultural sites for the purposes of removing wildlife have the potential for audible effects on the use and enjoyment of historic property. However, such methods would only be used at a historic site at the request of the owner or manager of the site to resolve a damage problem, which means such use, would be to the benefit of the historic property. A built-in minimization factor for this issue is that virtually all the methods involved would only have temporary effects on the audible nature of a site and would be ended at any time to restore the audible qualities of such sites to their original condition with no further adverse effects. Site-specific consultation as required by the Section 106 of the NHPA would be conducted as necessary in those types of situations.

Native American Graves Protection and Repatriation Act

The Native American Graves Protection and Repatriation Act require federal agencies to notify the Secretary of the Department that manages the federal lands upon the discovery of Native American cultural items on federal or tribal lands. Federal projects would discontinue work until a reasonable effort had been made to protect the items and the proper authority had been notified.

Coastal Zone Management Act of 1972, as amended (16 USC 1451-1464, Chapter 33; P.L. 92-583, October 27, 1972; 86 Stat. 1280).

This law established a voluntary national program within the Department of Commerce to encourage coastal states to develop and implement coastal zone management plans. Funds were authorized for cost-sharing grants to states to develop their programs. Subsequent to federal approval of their plans, grants would be awarded for implementation purposes. In order to be eligible for federal approval, each state's plan was required to define boundaries of the coastal zone, identify uses of the area to be regulated by the state, determine the mechanism (criteria, standards or regulations) for controlling such uses, and develop broad guidelines for priorities of uses within the coastal zone. In addition, this law established a system of criteria and standards for requiring that federal actions be conducted in a manner consistent with the federally approved plan. The standard for determining consistency varied depending on whether the federal action involved a permit, license, financial assistance, or a federally authorized activity. As appropriate, a consistency determination would be conducted by WS to assure management actions would be consistent with New York's Coastal Zone Management Program.

Invasive Species - Executive Order 13112

Executive Order 13112 establishes guidance to federal agencies to prevent the introduction of invasive species, provide for the control of invasive species, and to minimize the economic, ecological, and human health impacts that invasive species cause. The Order states that each federal agency whose actions may affect the status of invasive species shall, to the extent practicable and permitted by law: 1) reduce invasion of exotic species and the associated damages, 2) monitor invasive species populations and provide for restoration of native species and habitats, 3) conduct research on invasive species and develop technologies to prevent introduction, and 4) provide for environmentally sound control and promote public education of invasive species.

Environmental Justice in Minority and Low Income Populations - Executive Order 12898

Environmental Justice has been defined as the pursuit of equal justice and equal protection under the law for all environmental statutes and regulations without discrimination based on race, ethnicity, or socioeconomic status. Executive Order 12898 requires federal agencies to make Environmental Justice part of their mission, and to identify and address disproportionately high and adverse human health and environmental effects of federal programs, policies and activities on minority and low-income persons or populations. A critical goal of the Order is to improve the scientific basis for decision-making by conducting assessments that identify and prioritize environmental health risks and procedures for risk reduction. Environmental Justice is a priority within USDA, APHIS, and WS. APHIS plans to implement the order principally through compliance with the provisions of the NEPA.

WS' activities are evaluated for their impact on the human environment and compliance with the Order to ensure Environmental Justice. Wildlife Services personnel would use methods in as selective and environmentally conscious a manner as possible. All chemicals used by WS would be regulated by the EPA through FIFRA, NYS DAM, by MOUs with federal land management agencies, and by WS' Directives. The WS operational program properly disposes of any excess solid or hazardous waste. Wildlife Services' assistance is to provide on a requested basis, in cooperation with state and local governments and without discrimination against people who are of low income or in minority populations. The nature of WS' damage management activities is such that they do not have much, if any, potential to result in the disproportionate environmental effects on minority or low-income populations. Therefore, no such adverse or disproportionate environmental impacts to such persons or populations are expected.

Protection of Children from Environmental Health and Safety Risks - Executive Order 13045

Children may suffer disproportionately for many reasons from environmental health and safety risks, including the development of their physical and mental status. Wildlife Services make it a high priority to identify and assess environmental health and safety risks that may disproportionately affect children. Wildlife Services has considered the impacts that this proposal might have on children. The proposed activities would occur by using only legally available and approved methods where it is highly unlikely that children would be adversely affected. For these reasons, WS concludes that it would not create an environmental health or safety risk to children from implementing this proposed action. Additionally, the need for action identified a need to reduce threats to human safety, including risks to children; therefore, it would be expected that health and safety risks to children posed by white-tailed deer would be reduced under the alternatives.

Federal Food, Drug, and Cosmetic Act (21 USC 360)

This law places administration of pharmaceutical drugs, including those used in wildlife capture and handling, under the Food and Drug Administration.

Controlled Substances Act of 1970 (21 USC 821 et seq.)

This law requires an individual or agency to have a special registration number from the federal DEA to possess controlled substances, including those that are used in wildlife capture and handling.

Animal Medicinal Drug Use Clarification Act of 1994

The Animal Medicinal Drug Use Clarification Act and its implementing regulations (21 CFR 530) establish several requirements for the use of animal drugs, including those used to capture and handle wildlife in damage management programs. Those requirements are: (1) a valid “*veterinarian-client-patient*” relationship, (2) well defined record keeping, (3) a withdrawal period for animals that have been administered drugs, and (4) identification of animals. A veterinarian, either on staff or on an advisory basis, would be involved in the oversight of the use of animal capture and handling drugs under any alternative where WS would use those immobilizing and euthanasia drugs. Veterinary authorities in each state have the discretion under this law to establish withdrawal times (*i.e.*, a period after a drug is administered that must lapse before an animal may be used for food) for specific drugs. Animals that might be consumed by a human within the withdrawal period must be identified. Wildlife Services establishes procedures in each state for administering drugs used in wildlife capture and handling that must be approved by state veterinary authorities in order to comply with this law.

Occupational Safety and Health Act of 1970

The Occupational Safety and Health Act of 1970 and its implementing regulations (29 CFR 1910) on sanitation standards states that, “*Every enclosed workplace shall be so constructed, equipped, and maintained, so far as reasonably practical, as to prevent the entrance or harborage of rodents, insects, and other vermin. A continuing and effective extermination program shall be instituted where their presence is detected.*” This standard includes white-tailed deer that may cause safety and health concerns at workplaces.

Clean Water Act (Section 404)

Section 404 (33 USC 1344) of the Clean Water Act prohibits the discharge of dredged or fill material into waters of the United States without a permit from the United States Army Corps of Engineers unless the specific activity is exempted in 33 CFR 323 or covered by a nationwide permit in 33 CFR 330. The breaching of most beaver dams is covered by these regulations (33 CFR 323 and 330).

Food Security Act

The Wetland Conservation provision (Swampbuster) of the 1985 (16 U.S.C. 3801-3862), 1990 (as amended by PL 101-624), and 1996 (as amended by PL 104-127) farm bills require all agricultural producers to protect wetlands on the farms they own. Wetlands converted to farmland prior to December 23, 1985 are not subject to wetland compliance provisions even if wetland conditions return because of lack of maintenance or management. If prior converted cropland is not planted to an agricultural commodity (crops, native and improved pastures, rangeland, tree farms, and livestock production) for more than 5 consecutive years and wetland characteristics return, the cropland is considered abandoned and then becomes a wetland subject to regulations under Swampbuster and Section 404 of the Clean Water Act.

APPENDIX E

COSULTATION LETTERS

- I. USDA, APHIS, WS program in New York: Consultation Letter to NYSDEC**
- II. NYSDEC, Division of Fish, Wildlife & Marine Resources, Bureau of Wildlife: Letter of Concurrence**
- III. USDA, APHIS WS program in New York: Consultation Letter to USFWS**
- IV. USFWS: Letter of Concurrence**



United States
Department of
Agriculture

Animal and
Plant Health
Inspection
Service

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12033

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518-477-4899 fax

October 1, 2014

Dan Rosenblatt
NYSDEC, Bureau of Wildlife
625 Broadway
Albany, NY 12233

Dear Dan,

This letter initiates the U.S. Department of Agriculture, Animal and Plant Health Inspection Service, Wildlife Services' request for consultation on the potential risks to state-listed threatened and endangered species from management for white-tailed deer in New York. This consultation is requested pursuant to the completion of Environmental Assessment (EA): "White-tailed Deer Damage Management in New York." A draft of the EA has been enclosed for your use. The New York State Department of Environmental Conservation (NYSDEC), Bureau of Wildlife and The New York State Department of Agriculture and Markets (NYS DAM) are cooperating agencies in the preparation of this EA.

PROPOSED ACTION

U.S. Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Wildlife Services (WS) is seeking concurrence in the development of an Environmental Assessment (EA) addressing damage and threats caused by white-tailed deer in New York in compliance with the Endangered Species Act (ESA). NYSDEC is requested to review the Wildlife Services analysis and EA for compliance with Section 7 of the ESA. I have provided an agency reviewed draft environmental assessment for the Section 7 consultation on the management of white-tailed deer causing damage in the State of New York. The need for action identifies damage to agricultural resources, property, natural resources, and threats to human health and safety associated with white-tailed deer in the State.

In recent years, high populations of white-tailed deer have been reported across New York. High populations of white-tailed deer are a particular threat to native wildlife and ecosystems, can do considerable damage to agriculture and property, and are a disease threat to human health and safety.

The EA evaluates the need for action and the proposed use of methods by WS to reduce damage caused by white-tailed deer. A number of issues and concerns were identified through WS' scoping processes and through consultation with state and federal agencies that were used to develop alternatives for evaluation in the EA. Alternatives examined in the EA include an alternative in which WS continues the current white-tailed deer management program; an alternative in which WS is restricted to providing technical assistance only; an alternative in which no white-tailed deer damage management is conducted by WS. The first alternative considered, the preferred alternative, is for WS and the cooperating agencies to continue a white-tailed deer management program that includes the use of the full range of legal non-lethal and



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lethal damage management techniques. Cooperators requesting assistance would be provided with recommendations and information regarding the use of effective non-lethal and lethal techniques. Non-lethal methods recommended and used by WS may include physical exclusion, supplemental feeding, animal behavior modification, live capture and translocation, or sterilization. Lethal methods recommended and used by WS may include the use of euthanasia, shooting, legal hunting, chemical pesticides, and live capture and euthanasia. All WS activities would continue to be conducted in accordance with applicable State, Federal, and local laws and regulations.

The EA provides a detailed analysis of the impacts of each alternative on white-tailed deer populations; non-target species including state and federally-listed threatened and endangered species; public health and safety; humaneness of the alternatives used, relative efficacy in reducing damage and on sociological concerns including humaneness and animal welfare.

Alternative 1 - Continuing the Current Integrated Approach to Managing White-tailed Deer Damage (Proposed Action/No Action)

The proposed action/no action alternative would continue the current implementation of an adaptive integrated approach utilizing non-lethal and lethal techniques, when requested, as deemed appropriate using the WS Decision Model, to reduce damage and threats caused by white-tailed deer in New York. A major goal of the program would be to resolve and prevent damage caused by white-tailed deer and to reduce threats to human safety. To meet this goal, WS, in consultation the NYSDEC, would continue to respond to requests for assistance with, at a minimum, technical assistance, or when funding was available, operational damage management. Funding could occur through federal appropriations or from cooperative funding. The adaptive approach to managing damage associated with white-tailed deer would integrate the use of the most practical and effective methods to resolve a request for damage management as determined by a site-specific evaluation to reduce damage or threats to human safety for each request. City/town managers, agricultural producers, property owners, and others requesting assistance would be provided information regarding the use of appropriate non-lethal and lethal techniques.

Under this alternative, WS could respond to requests for assistance by: 1) taking no action, if warranted, 2) providing only technical assistance to property owners or managers on actions they could take to reduce damages caused by white-tailed deer, or 3) providing technical assistance and direct operational assistance to a property owner or manager experiencing damage. The take of white-tailed deer can only legally occur through the issuance of a permit by the NYSDEC and only at levels specified in the permit.

Property owners or managers requesting assistance from WS could be provided with information regarding the use of effective and practical non-lethal and lethal techniques. Preference would be given to non-lethal methods when practical and effective under this alternative (see WS Directive 2.101). Property owners or managers may choose to implement WS' recommendations on their own (*i.e.*, technical assistance), use contractual services of private businesses, use volunteer services of private organizations, use the services of WS (*i.e.*, direct operational assistance), take the management action themselves, or take no further action.





WS would work with those persons experiencing white-tailed deer damage in addressing those white-tailed deer responsible for causing damage as expeditiously as possible. To be most effective, damage management activities would occur as soon as white-tailed deer begin to cause damage. White-tailed deer damage that has been ongoing can be difficult to resolve using available methods since white-tailed deer would be conditioned to an area and would be familiar with a particular location. Deer damage can be difficult to resolve if people wait until damage is at crisis levels before implementing abatement activities or seeking assistance. Subsequently, making that area unattractive using available methods could be difficult to achieve once damage was ongoing. WS would work closely with those entities requesting assistance to identify situations where damage could occur and begin to implement damage management activities under this alternative as early as possible to increase the likelihood of those methods achieving the level of damage reduction requested by the cooperating entity.

Alternative 2 – White-tailed Deer Damage Management by WS through Technical Assistance Only

Under this alternative, WS would provide those cooperators requesting assistance with technical assistance only. Similar to Alternative 1, WS could receive requests for assistance from community representatives, private individuals/businesses, or from public entities. Technical assistance would provide those cooperators experiencing damage or threats associated with white-tailed deer with information, demonstrations, and recommendations on available and appropriate methods. The implementation of methods and techniques to resolve or prevent damage would be the responsibility of the requester with no direct involvement by WS. In some cases, WS may provide supplies or materials that were of limited availability for use by private entities (e.g., loaning of propane cannons). Technical assistance may be provided through a personal or telephone consultation, or during an on-site visit with the requester. Generally, several management strategies would be described to the requester for short and long-term solutions to managing damage; those strategies would be based on the level of risk, need, and the practicality of their application. WS would use the Decision Model to recommend those methods and techniques available to the requester to manage damage and threats of damage. Those persons receiving technical assistance from WS could implement those methods recommended by WS, could employ other methods not recommended by WS, could seek assistance from other entities, or take no further action.

Under a technical assistance only alternative, WS would recommend an integrated approach similar to the proposed action alternative (Alternative 1) when receiving a request for assistance; however, WS would not provide direct operational assistance under this alternative. Recommendation of methods and techniques by WS to resolve damage would be based on information provided by the individual seeking assistance using the WS Decision Model. In some instances, wildlife-related information provided to the requestor by WS would result in tolerance/acceptance of the situation. In other instances, damage management options would be discussed and recommended. Only those methods legally available for use by the appropriate individual would be recommend or loaned by WS. Similar to Alternative 1, those methods described in Appendix B would be available to those persons experiencing damage or threats associated with white-tailed deer except for immobilizing drugs, euthanasia chemicals, and reproductive inhibitors. Immobilizing drugs and euthanasia chemicals would only be available



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to WS or appropriately licensed veterinarians. Under this alternative, the reproductive inhibitor available under the trade name of Gonacon™ would only be available for use by the NYSDEC or those persons under the supervision of the NYSDEC. At the time this EA was developed, Gonacon™ was not registered for use in the state.

WS regularly provides technical assistance to individuals, organizations, and other federal, state, and local government agencies for managing white-tailed deer damage. Technical assistance would include collecting information about the species involved, the nature and extent of the damage, and previous methods that the cooperators had attempted to resolve the problem. WS would then provide information on appropriate methods that the cooperators could consider to resolve the damage themselves. Types of technical assistance projects may include a visit to the affected property, written communication, telephone conversations, or presentations to groups such as homeowner associations or civic leagues.

This alternative would place the immediate burden of operational damage management work on the resource owner, other governmental agencies, and/or private businesses. Those persons experiencing damage or were concerned with threats posed by white-tailed deer could seek assistance from other governmental agencies, private entities, or conduct damage management on their own. Those persons experiencing damage or threats could take action using those methods legally available to resolve or prevent white-tailed deer damage as permitted by federal, state, and local laws and regulations or those persons could take no action.

Alternative 3 – No White-tailed Deer Damage Management Conducted by WS

This alternative would preclude all activities by WS to reduce threats to human health and safety, and to alleviate damage to agricultural resources, property, and natural resources. WS would not be involved with any aspect of white-tailed deer damage management. All requests for assistance received by WS to resolve damage caused by white-tailed deer would be referred to the NYSDEC, other governmental agencies, and/or private entities.

Despite no involvement by WS in resolving damage and threats associated with white-tailed deer, those persons experiencing damage caused by white-tailed deer could continue to resolve damage by employing those methods legally available since the take of white-tailed deer can occur despite the lack of involvement by WS. The take of white-tailed deer by other entities could occur through the issuance of permits by the NYSDEC, when required, and during the legal hunting seasons. All methods described in Appendix B of the environmental assessment would be available for use by those persons experiencing damage or threats under this alternative, except for the use of Gonacon™, immobilizing drugs, and euthanasia chemicals. Gonacon™ could only be used by WS and the NYSDEC. Immobilizing drugs and euthanasia chemicals could only be used by WS or appropriately licensed veterinarians.

Under this alternative, those persons experiencing damage or threats of damage could contact WS; however, WS would immediately refer the requester to the NYSDEC and/or other entities. The requester could contact other entities for information and assistance with managing damage, could take actions to alleviate damage without contacting any entity, or could take further no action.



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IMPACT ANALYSIS

The following assessments were made based on a review of the list of threatened and endangered species obtained from the NYSDEC web site (<http://www.dec.ny.gov/animals/7494.html>) on September 19, 2014.

Species Which Will Not Be Impacted by the Proposed Action

Mollusks and Fishes: State listed mollusks and fishes which might occur in or near the project area will not be impacted by the proposed action. Accessing sites for white-tailed deer management activities will not result in the direct take of any mollusks or fishes, or cause damage to or loss of these species' habitats. Based on these measures, the proposed action is expected to have no impact on state-listed mollusks or fishes.

Species Not Likely to be Adversely Affected by the Proposed Action

Mammals: None of the white-tailed deer management actions proposed in the EA would result in the direct take of any state-listed mammals. State-listed mammals which might occur within the project are not likely to be impacted by the proposed action. Accessing sites for white-tailed deer management activities are not likely to result in damage to or state-listed mammals' habitats. Based on these measures, the proposed action is not expected to adversely affect state-listed mammals.

Reptiles and Amphibians: None of the white-tailed deer management actions proposed in the EA would result in the direct take of any state-listed reptiles or amphibians. Wildlife Services does not conduct habitat management, but could recommend these actions to landowners/managers. Habitat management actions could include fencing and exclusion systems and these actions may take place near habitat used by reptiles and amphibians. None of these alterations are expected to adversely impact reptiles and amphibians, and may act as a barrier of protection if deployed in areas where white-tailed deer exist. Landowner/managers would be responsible for complying with NYSDEC requirements for the protection of turtles of amphibians.

Given the above provisions, the proposed action is not expected to adversely affect state-listed reptiles and amphibians.

Insects: None of the white-tailed deer damage management actions proposed in the EA would result in the direct take of any state-listed insects. Wildlife Services does not conduct habitat management, but could recommend these actions to landowners/managers. Habitat management actions could include fencing and exclusion systems and these actions may take place within habitat used by insects. None of these alterations are likely to adversely impact insects, and may act as a barrier of protection if deployed in areas where insect habitat is being destroyed by white-tailed deer.

Given the above provisions, the proposed action is not expected to adversely affect state-listed insects.





Plants: The white-tailed deer damage management actions likely to impact state-listed plants are recommendations for deer removal projects. These actions pose a slight risk that a state or federally listed species could be crushed during management activities, specifically while attempting to cull white-tailed deer. Exclusion systems may impact plants, but this impact would most likely be beneficial because it would limit white-tailed deer consumption and trampling of plants. These actions are expected to have little or no adverse impacts on state-listed plants. Projects reduce white-tailed deer numbers statewide and serve the dual purpose of reducing risks to threatened and endangered species in areas where white-tailed deer may be impacting habitats. Wildlife Services would avoid using areas of native vegetation for vehicle access and would work to minimize foot traffic through areas of native vegetation. WS will consult with NYSDEC regarding the presence of state-listed plants and will abide by state recommendations for the protection of listed plants.

Based on the above measures, the proposed action may affect, but is not likely to adversely affect state-listed plants.

Birds: None of the white-tailed deer management actions proposed in the EA would result in the direct take of any birds. Recommendations for local deer population reduction may lead to beneficial effects on bird species by providing protection for ground nesting birds. Scavenger birds could however potentially be drawn to carcasses of dead deer, and sensitive species may be at risk if they ingest any animal, or part of an animal, that has been shot by a lead bullet. While this is a serious concern, Wildlife Services does not believe that white-tailed deer management is likely to pose a risk to these scavenger or predatory birds. Over the past year, Wildlife Services shot a total of 432 deer, and only 2 deer were not recovered. One unrecovered deer is believed to still be alive. The deer that are culled by Wildlife Services are generally shot in the head or neck area, carefully processed, and viscera are safely disposed of. Lead fragments is unlikely to be in viscera of deer shot in the head or neck. Wildlife Services biologists are trained in the identification of state-listed birds and would have the ability to identify these birds. Wildlife Services will re-initiate consultation with the NYSDEC if state-listed species are regularly observed in the vicinity of areas where management activities will occur or are of a prolonged duration.

Based on the above measures the proposed action may affect, but is not likely to adversely affect, any state listed bird species.

SUMMARY

This concludes our assessment of risks to state-listed species from white-tailed deer management activities which may be conducted statewide. Based on the above information we conclude that although proposed actions may result in some risk to state listed species, overall the risk is low and given the proposed protective measures, will not jeopardize state threatened and endangered species populations. We request NYSDEC concurrence with these determinations. If you have any questions of if I can be of further assistance, please contact me at the phone number, address, or email address below.



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Thank you for your assistance with this matter.

Sincerely,

Martin S. Lowney
State Director - New York
USDA, APHIS, Wildlife Services
1930 Route 9
Castleton-on-Hudson, NY 12033
(518) 477-4837 (phone)
(518) 477-4899 (fax)
Martin.S.Lowney@aphis.usda.gov

Enclosures: Environmental Assessment: White-tailed deer damage management in New York,
August 2014



NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
Division of Fish, Wildlife & Marine Resources
Bureau of Wildlife

625 Broadway, 5th Floor, Albany, New York 12233-4754

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Joseph Martens
Commissioner

Martin S. Lowney, State Director
USDA, APHIS, Wildlife Services
1930 Route 9
Castleton, NY 12033

October 8, 2014

Dear Martin,

This letter is in response to your October 1, 2014 request for concurrence on potential risks to state-listed threatened and endangered species from the implementation of alternatives as outlined in the Environmental Assessment (EA) prepared by the USDA-APHIS-WS for White-tailed Deer Damage Management in New York.

As outlined in the document dated August, 2014 and submitted to this office, a series of deer management actions are outlined and examined for potential impacts to those state-listed species that can be reasonably anticipated to occur within the project area. The analysis conducted was inclusive of all species, both plant and animal, that may be potentially impacted.

This office can concur that the description of deer management activities and the concomitant analysis and conclusions for impacts on listed species are justified and appropriate. For all activities delineated in the EA and Appendix B of the EA, we are in concurrence that the actions of USDA APHIS WS are not likely to adversely affect State or Federally-listed species.

Sincerely,

Dan Rosenblatt
Wildlife Diversity Section Head

cc Gordon Batcheller, NYSDEC
Bryan Swift, NYSDEC

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November 18, 2014

Tim Sullivan
U.S. Fish and Wildlife Service
Ecological Services
3817 Luker Rd.
Cortland, NY 13045

Dear Mr. Sullivan:

This letter initiates a U.S. Department of Agriculture, Animal and Plant Health Inspection Service, Wildlife Services' (WS) request for an informal Section 7 consultation on the management of white-tailed deer causing damage in the State of New York. Enclosed you will find the Biological Assessment addressing potential impacts as outlined in the draft environmental assessment: *White-tailed Deer Damage Management in New York*.

Proposed Federal Action:

U.S. Department of Agriculture, Animal and Plant Health Inspection Service (APHIS), Wildlife Services (WS) is seeking concurrence in the development of an Environmental Assessment (EA) addressing damage and threats caused by white-tailed deer in New York in compliance with the Endangered Species Act (ESA). I have provided an agency reviewed draft for the Section 7 consultation on the management of white-tailed deer causing damage in the State of New York. The need for action identifies damage to agricultural resources, property, natural resources, and threats to human safety associated with white-tailed deer in the State.

In recent years, high populations of white-tailed deer have been reported across New York. High populations of white-tailed deer are a particular threat to native wildlife and ecosystems, can do considerable damage to agriculture and property, and are a disease threat to human health and safety.

The EA evaluates the need for action and the proposed use of methods by WS to reduce damage caused by white-tailed deer. A number of issues and concerns were identified through WS's scoping processes and through consultation with state and federal agencies that were used to develop alternatives for evaluation in the EA. Alternatives examined in the EA include an alternative in which WS continues the current white-tailed deer management program; an alternative in which WS is restricted to providing technical assistance only; an alternative in which no white-tailed deer damage management is conducted by WS. The first alternative considered, the preferred alternative, is for WS and the cooperating agencies to



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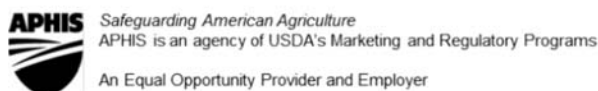
continue a white-tailed deer management program that includes the use of the full range of legal non-lethal and lethal damage management techniques. Cooperators requesting assistance would be provided with recommendations and information regarding the use of effective non-lethal and lethal techniques. Non-lethal methods recommended and used by WS may include physical exclusion, supplemental feeding, animal behavior modification, live capture and translocation, or sterilization. Lethal methods recommended and used by WS may include the use of euthanasia, shooting, legal hunting, chemical pesticides (repellents), and live capture and euthanasia. All WS activities would continue to be conducted in accordance with applicable State, Federal, and local laws and regulations.

The EA provides a detailed analysis of the impacts of each alternative on white-tailed deer populations; non-target species including state and federally-listed threatened and endangered species; public health and safety; humaneness of the alternatives used, relative efficacy in reducing damage and on sociological concerns including humaneness and animal welfare.

An overview of the purpose and need for action related to damage white-tailed deer could cause to New York's resources are described in Chapter 1. Issues which may affect the implementation of a management program involving federal resources are identified in Chapter 2. Detailed descriptions of the specific management alternatives are provided in Chapter 3 of the draft environmental assessment. An assessment of impacts on non-target species for each alternative is provided in Chapter 4. A summary of methods available to Wildlife Services for use in resolving or preventing white-tailed deer damage is included in Appendix B.

Alternative 1 - Continuing the Current Integrated Approach to Managing White-tailed Deer Damage (Proposed Action/No Action)

The proposed action/no action alternative would continue the current implementation of an adaptive integrated approach utilizing non-lethal and lethal techniques, when requested, as deemed appropriate using the WS Decision Model, to reduce damage and threats caused by white-tailed deer in New York. A major goal of the program would be to resolve and prevent damage caused by white-tailed deer and to reduce threats to human safety. To meet this goal, WS, in consultation the NYSDEC, would continue to respond to requests for assistance with, at a minimum, technical assistance, or when funding was available, operational damage management. Funding could occur through federal appropriations or from cooperative funding. The adaptive approach to managing damage associated with white-tailed deer would integrate the use of the most practical and effective methods to resolve a request for damage management as determined by a site-specific evaluation to reduce damage or threats to human safety for each request. City/town managers, agricultural producers, property owners, and others requesting assistance would be provided information regarding the use of appropriate non-lethal and lethal techniques.





Under this alternative, WS could respond to requests for assistance by: 1) taking no action, if warranted, 2) providing only technical assistance to property owners or managers on actions they could take to reduce damages caused by white-tailed deer, or 3) providing technical assistance and direct operational assistance to a property owner or manager experiencing damage. The take of white-tailed deer can only legally occur through the issuance of a permit by the NYSDEC and only at levels specified in the permit.

Property owners or managers requesting assistance from WS could be provided with information regarding the use of effective and practical non-lethal and lethal techniques. Preference would be given to non-lethal methods when practical and effective under this alternative (see WS Directive 2.101). Property owners or managers may choose to implement WS' recommendations on their own (*i.e.*, technical assistance), use contractual services of private businesses, use volunteer services of private organizations, use the services of WS (*i.e.*, direct operational assistance), take the management action themselves, or take no further action.

WS would work with those persons experiencing white-tailed deer damage in addressing those white-tailed deer responsible for causing damage as expeditiously as possible. To be most effective, damage management activities would occur as soon as white-tailed deer begin to cause damage. White-tailed deer damage that has been ongoing can be difficult to resolve using available methods since white-tailed deer would be conditioned to an area and would be familiar with a particular location. Deer damage can be difficult to resolve if people wait until damage is at crisis levels before implementing abatement activities or seeking assistance. Subsequently, making that area unattractive using available methods could be difficult to achieve once damage was ongoing. WS would work closely with those entities requesting assistance to identify situations where damage could occur and begin to implement damage management activities under this alternative as early as possible to increase the likelihood of those methods achieving the level of damage reduction requested by the cooperating entity.

Alternative 2 – White-tailed Deer Damage Management by WS through Technical Assistance Only

Under this alternative, WS would provide those cooperators requesting assistance with technical assistance only. Similar to Alternative 1, WS could receive requests for assistance from community representatives, private individuals/businesses, or from public entities. Technical assistance would provide those cooperators experiencing damage or threats associated with white-tailed deer with information, demonstrations, and recommendations on available and appropriate methods. The implementation of methods and techniques to resolve or prevent damage would be the responsibility of the requester with no direct involvement by WS. In some cases, WS may provide supplies or materials that were of limited availability for use by private entities (*e.g.*, loaning of propane cannons). Technical assistance may be provided





through a personal or telephone consultation, or during an on-site visit with the requester. Generally, several management strategies would be described to the requester for short and long-term solutions to managing damage; those strategies would be based on the level of risk, need, and the practicality of their application. WS would use the Decision Model to recommend those methods and techniques available to the requester to manage damage and threats of damage. Those persons receiving technical assistance from WS could implement those methods recommended by WS, could employ other methods not recommended by WS, could seek assistance from other entities, or take no further action.

Under a technical assistance only alternative, WS would recommend an integrated approach similar to the proposed action alternative (Alternative 1) when receiving a request for assistance; however, WS would not provide direct operational assistance under this alternative. Recommendation of methods and techniques by WS to resolve damage would be based on information provided by the individual seeking assistance using the WS Decision Model. In some instances, wildlife-related information provided to the requestor by WS would result in tolerance/acceptance of the situation. In other instances, damage management options would be discussed and recommended. Only those methods legally available for use by the appropriate individual would be recommend or loaned by WS. Similar to Alternative 1, those methods described in Appendix B would be available to those persons experiencing damage or threats associated with white-tailed deer except for immobilizing drugs, euthanasia chemicals, and reproductive inhibitors. Immobilizing drugs and euthanasia chemicals would only be available to WS or appropriately licensed veterinarians. Under this alternative, the reproductive inhibitor available under the trade name of Gonacon™ would only be available for use by the NYSDEC or those persons under the supervision of the NYSDEC. At the time this EA was developed, Gonacon™ was not registered for use in the state.

WS regularly provides technical assistance to individuals, organizations, and other federal, state, and local government agencies for managing white-tailed deer damage. Technical assistance would include collecting information about the species involved, the nature and extent of the damage, and previous methods that the cooperator had attempted to resolve the problem. WS would then provide information on appropriate methods that the cooperator could consider to resolve the damage themselves. Types of technical assistance projects may include a visit to the affected property, written communication, telephone conversations, or presentations to groups such as homeowner associations or civic leagues.

This alternative would place the immediate burden of operational damage management work on the resource owner, other governmental agencies, and/or private businesses. Those persons experiencing damage or were concerned with threats posed by white-tailed deer could seek assistance from other governmental agencies, private entities, or conduct damage management on their own. Those persons experiencing damage or threats could take action using those methods legally



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available to resolve or prevent white-tailed deer damage as permitted by federal, state, and local laws and regulations or those persons could take no action.

Alternative 3 – No White-tailed Deer Damage Management Conducted by WS

This alternative would preclude all activities by WS to reduce threats to human health and safety, and to alleviate damage to agricultural resources, property, and natural resources. WS would not be involved with any aspect of white-tailed deer damage management. All requests for assistance received by WS to resolve damage caused by white-tailed deer would be referred to the NYSDEC, other governmental agencies, and/or private entities.

Despite no involvement by WS in resolving damage and threats associated with white-tailed deer, those persons experiencing damage caused by white-tailed deer could continue to resolve damage by employing those methods legally available since the take of white-tailed deer can occur despite the lack of involvement by WS. The take of white-tailed deer by other entities could occur through the issuance of permits by the NYSDEC, when required, and during the legal hunting seasons. All methods described in Appendix B of the environmental assessment would be available for use by those persons experiencing damage or threats under this alternative, except for the use of Gonacon™, immobilizing drugs, and euthanasia chemicals. Gonacon™ could only be used by WS and the NYSDEC. Immobilizing drugs and euthanasia chemicals could only be used by WS or appropriately licensed veterinarians.

Under this alternative, those persons experiencing damage or threats of damage could contact WS; however, WS would immediately refer the requester to the NYSDEC and/or other entities. The requester could contact other entities for information and assistance with managing damage, could take actions to alleviate damage without contacting any entity, or could take further no action.

For purposes of this consultation, we are analyzing the risks to federally-listed T&E and proposed species.

IMPACT ANALYSIS

Wildlife Services has reviewed the list of T&E, proposed, and candidate species listed in the state of New York from USFWS Region 5 (<http://www.fws.gov/northeast/nyfo/es/SELIST12-18-2013.pdf>) and identified the following species within the project area:

American hart's tongue fern (*Asplenium scolopendrium* var. *americana*) - threatened
Bog Turtle (*Glyptemys muhlenbergii*) - threatened
Bald Eagle (*Haliaeetus leucocephalus*) - delisted
Chittenango ovate amber snail (*Novisuccinea chittenangoensis*) – threatened
Clubshell (*Pleurobema clava*) - endangered



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Dwarf wedgemussel (*Alasmidonta heterodon*) – endangered
Eastern Massasauga Rattlesnake (*Sistrurus catenatus catenatus*) – candidate
Eastern prairie fringed orchid (*Platanthera leucophaea*) - threatened
Green sea turtle (*Chelonia mydas*) - threatened
Hawksbill turtle (*Eretmochelys imbricate*) – endangered
Houghton’s Goldenrod (*Solidago houghtonii*) - threatened
Indiana bat (*Myotis sodalist*) - endangered
Karner blue butterfly (*Lycaeides melissa samuelis*) – endangered
Kemp’s [Atlantic] ridley turtle (*Lepidochelys kempi*) - endangered
Leatherback turtle (*Dermochelys coriacea*) - endangered
Leedy’s roseroot (*Rhodiola integrifolia* ssp. *leedyi*) - threatened
Loggerhead turtle (*Caretta caretta*) – threatened
New England Cottontail (*Sylvilagus transitionalis*) - candidate
Northeastern bulrush (*Scirpus ancistrochaetus*) – endangered
Northern Long-eared Bat (*Myotis septentrionalis*) – proposed endangered
Northern wild monkshood (*Aconitum noveboracense*) - threatened
Piping Plover (*Charadrius melodus*) – threatened
Rayed Bean (*Villos fabalis*) - endangered
Red Knot (*Calidris canutus*) – proposed threatened
Roseate Tern (*Sterna dougallii*) - endangered
Sandplain Gerardia (*Agalinus acuta*) - endangered
Seabeach Amaranth (*Amaranthus pumilus*) - threatened
Small Whorled Pogonia (*Isotria medeoloides*) - threatened
Swamp Pink (*Helonias bullata*) – threatened

Species Which Will Not Be Impacted by the Proposed Action

Bog Turtle (*Glyptemys muhlenbergii*) – threatened
Chittenango ovate amber snail (*Novisuccinea chittenangoensis*) – threatened
Clubshell (*Pleurobema clava*) - endangered
Dwarf wedgemussel (*Alasmidonta heterodon*) – endangered
Eastern Massasauga Rattlesnake (*Sistrurus catenatus catenatus*) – candidate
Eastern prairie fringed orchid (*Platanthera leucophaea*) – threatened
Green sea turtle (*Chelonia mydas*) - threatened
Hawksbill turtle (*Eretmochelys imbricate*) – endangered
Houghton’s Goldenrod (*Solidago houghtonii*) - threatened
Indiana bat (*Myotis sodalist*) - endangered
Kemp’s [Atlantic] ridley turtle (*Lepidochelys kempi*) - endangered
Leatherback turtle (*Dermochelys coriacea*) – endangered
Leedy’s roseroot (*Rhodiola integrifolia* ssp. *leedyi*) - threatened
Loggerhead turtle (*Caretta caretta*) – threatened
Northern Long-eared Bat (*Myotis septentrionalis*) – proposed endangered
Piping Plover (*Charadrius melodus*) – threatened
Rayed Bean (*Villos fabalis*) - endangered
Red Knot (*Calidris canutus*) – proposed threatened



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Roseate Tern (*Sterna dougallii*) - endangered
Swamp Pink (*Helonias bullata*) – threatened

Species Which May Be Affected But Which Are Not Likely to Be Adversely Affected.

American hart's tongue fern (*Asplenium scolopendrium var. americana*) – threatened
Bald Eagle (*Haliaeetus leucocephalus*) – delisted
Karner blue butterfly (*Lycaeides melissa samuelis*) – endangered
New England Cottontail (*Sylvilagus transitionalis*) - candidate
Northeastern bulrush (*Scirpus ancistrochaetus*) – endangered
Northern wild monkshood (*Aconitum noveboracense*) - threatened
Sandplain Gerardia (*Agalinus acuta*) - endangered
Seabeach Amaranth (*Amaranthus pumilus*) – threatened
Small Whorled Pogonia (*Isotria medeoloides*) - threatened

This concludes our assessment of risks to federally-listed species from white-tailed deer damage management activities which may be conducted in New York. We request USFWS concurrence with these determinations within 30 days. If you have any questions or if I can be of further assistance, please contact me at the phone number, address, or email address below.

Thank you for your assistance with this matter.

Sincerely,

Martin S. Lowney
State Director - New York
USDA, APHIS, Wildlife Services
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Enclosures: Chart of Federally-Listed Endangered and Threatened Species in New York State.
Environmental Assessment: White-tailed deer damage management in New York, August 2014



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Federally-Listed Endangered and Threatened Species in New York State (Listed by Species)
 USDA Wildlife Services – White-tailed Deer Damage Management in New York Environmental Assessment

Species	Counties	Habitat Characteristics	Habitat Comments	Methods	Determination
Bog Turtle (T) <i>Clemmys</i> [= <i>Glyptemys</i>] <i>muhlenbergii</i>	Albany, Cayuga, Columbia, Dutchess, Genesee, Monroe, Oneida, Onondaga, Ontario, Orange, Orleans, Oswego, Otsego, Putnam, Rockland, Seneca, Sullivan, Tompkins, Ulster, Warren, Wayne, Westchester	<ul style="list-style-type: none"> Emergent and scrub/shrub wetlands such as shallow spring-fed fens, sphagnum bogs, swamps, marshy meadows, and wet pastures. 	<ul style="list-style-type: none"> White-tailed deer management activities are not expected to result in impact of Bog Turtle habitat 	<ul style="list-style-type: none"> Physical exclusion Drop net Rocket net Sterilization Contraceptives Immobilization and euthanasia drugs Stationary and vehicle based sharp shooting Deer retrieval and removal 	<ul style="list-style-type: none"> No Effect
Indiana Bat (E) <i>Myotis sodalis</i>	Albany, Cayuga, Clinton, Columbia, Dutchess, Essex, Greene, Jefferson, Lewis, Madison, Oneida, Onondaga, Orange, Oswego, Putnam, Seneca, Rensselaer, Rockland, Saratoga, Schenectady, Schoharie, Sullivan, Ulster, Warren, Washington, Wayne, Westchester	<ul style="list-style-type: none"> During winter, caves located in karst areas of the east-central United States or man-made excavated mines. In summer, roost sites under the bark of dead or dying trees that retain large, thick slabs of peeling bark. 	<ul style="list-style-type: none"> White-tailed deer management activities are not expected to result in the removal of any trees or occur in any mines or caves. 	<ul style="list-style-type: none"> Physical exclusion Drop net Rocket net Sterilization Contraceptives Immobilization and euthanasia drugs Stationary and vehicle based sharp shooting Deer retrieval and removal 	<ul style="list-style-type: none"> No Effect
Karner Blue Butterfly (E) Karner Blue Butterfly (E) <i>Lycaeides melissa samuelis</i>	Albany, Saratoga, Schenectady, Warren	Dependent on wild lupine, in upland savanna and barrens habitats typified by dry sandy soils, pitch pine or dune/sand plain plant communities; and now occur in roadsides, military bases, and some forest lands.	<ul style="list-style-type: none"> Refer to U.S. Fish and Wildlife Service New York Field Office website for additional information on survey protocols for Karner Blue Butterfly and their habitat: (http://www.fws.gov/northeast/nyfo/es/kbb.htm) Coordinate with U.S. Fish and Wildlife Service New York Field Office for any projects anticipated to impact this species or their habitat. Management of White-tailed deer would lead to an increase in wild lupine which would be beneficial for this species. Consult the NYSDEC Environmental Resource mapper at http://www.dec.ny.gov/imsmaps/ERM/viewer.htm to determine the locations of Karner Blue Butterfly. 	<ul style="list-style-type: none"> Physical exclusion Drop net Rocket net Sterilization Contraceptives Immobilization and euthanasia drugs Stationary and vehicle based sharp shooting Deer retrieval and removal 	<ul style="list-style-type: none"> May affect, but not likely to adversely affect

Species	Counties	Habitat Characteristics	Habitat Comments	Methods	Determination
Clubshell (E) <i>Pleurobuema clava</i>	Cattaraugus, Chautauqua	<ul style="list-style-type: none"> Prefers clean, loose sand and gravel in medium to small rivers and streams. 	<ul style="list-style-type: none"> White-tailed deer management activities are not expected occur in or disturb rivers, streams, or creeks. 	<ul style="list-style-type: none"> Physical exclusion Drop net Rocket net Sterilization Contraceptives Immobilization and euthanasia drugs Stationary and vehicle based sharp shooting Deer retrieval and removal 	<ul style="list-style-type: none"> No Effect
Rayed Bean (E) <i>Villosa fabalis</i>	Cattaraugus, Chautauqua	<ul style="list-style-type: none"> Prefers small headwater creeks clean, loose sand and gravel in medium to small rivers and streams. 	<ul style="list-style-type: none"> White-tailed deer management activities are not expected occur in or disturb rivers, streams, or creeks. 	<ul style="list-style-type: none"> Physical exclusion Drop net Rocket net Sterilization Contraceptives Immobilization and euthanasia drugs Stationary and vehicle based sharp shooting Deer retrieval and removal 	<ul style="list-style-type: none"> No Effect
Houghton's Goldenrod (T) <i>Solidago houghtonii</i>	Genesee	<ul style="list-style-type: none"> This plant typically grows in moist sandy beaches and shallow depressions between low sand ridges along the shoreline. 	<ul style="list-style-type: none"> White-tailed deer management activities are not expected to occur in wetlands along the Great Lakes shoreline. 	<ul style="list-style-type: none"> Physical exclusion Drop net Rocket net Sterilization Contraceptives Immobilization and euthanasia drugs Stationary and vehicle based sharp shooting Deer retrieval and removal 	<ul style="list-style-type: none"> No Effect

Species	Counties	Habitat Characteristics	Habitat Comments	Methods	Determination
Northern Wild Monkshood (T) <i>Aconitum noveboracense</i>	Delaware, Sullivan, Ulster	<ul style="list-style-type: none"> This plant is typically found on shaded or partly shaded cliffs, algific talus slopes, or on cool, streamside sites. These areas have cool soil conditions, cold air drainage, or cold groundwater flowage. This plant has distinct blue hood-shaped flowers. Stems range about 1-4 ft. tall. Habitat consists of sand, firm muddy sand, firm clay, and/or gravel bottom in creeks and rivers of various sizes. 	<ul style="list-style-type: none"> Contact the U.S. Fish and Wildlife Service New York Field Office for projects that may impact the watershed of the Lower Beaverkill. Contact U.S. Fish and Wildlife Service New York Field Office for projects within ¼ mile of Delaware and Neversink Rivers and their tributaries. 	<ul style="list-style-type: none"> Physical exclusion Drop net Rocket net Sterilization Contraceptives Immobilization and euthanasia drugs Stationary and vehicle based sharp shooting Deer retrieval and removal 	<ul style="list-style-type: none"> May affect, but not likely to adversely affect
Dwarf Wedgemussel (E) <i>Alasmidonta heterodon</i>	Delaware, Dutchess, Sullivan,	<ul style="list-style-type: none"> Habitat consists of sand, firm muddy sand, firm clay, and/or gravel bottom in creeks and rivers of various sizes. Requires areas of slow to moderate current, good water quality and little silt deposition. 	<ul style="list-style-type: none"> White-tailed deer management activities are not expected occur in or disturb rivers, streams, or creeks. 	<ul style="list-style-type: none"> Physical exclusion Drop net Rocket net Sterilization Contraceptives Immobilization and euthanasia drugs Stationary and vehicle based sharp shooting Deer retrieval and removal 	<ul style="list-style-type: none"> No Effect
Eastern prairie fringed orchid (T) (Historic) <i>Plantanthera leucophaea</i>	Genesee, Niagara, Onondaga, Orleans, Wayne	<ul style="list-style-type: none"> This plant is found in habitats ranging from mesic prairie to wetlands such as sedge meadows, marsh edges and bogs. Requires full sun and grassy habitat with little or no woody encroachments. 	<ul style="list-style-type: none"> This plant is considered extirpated in New York. 	<ul style="list-style-type: none"> Physical exclusion Drop net Rocket net Sterilization Contraceptives Immobilization and euthanasia drugs Stationary and vehicle based sharp shooting Deer retrieval and removal 	<ul style="list-style-type: none"> No Effect

Species	Counties	Habitat Characteristics	Habitat Comments	Methods	Determination
Roseate Tern (E) <i>Sterna dougallii dougallii</i>	Nassau, Queens, Suffolk,	<ul style="list-style-type: none"> Nests can be small depressions in the sand, shell, or gravel, and may be lined with bits of grass and other debris. Nests are usually placed in dense grass clumps, or even under boulders or riprap. Forages in near-shore waters. Uses a variety of substrates, including pea gravel, open sand, overhanging rocks, and salt marshes. 	<ul style="list-style-type: none"> Wildlife Services biologists are trained in bird identification and are aware of locations where the species breeds. White-tailed deer management activities are not expected to occur in habitats occupied by Roseate Tern. Please visit http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B070 for additional information on Roseate Tern. 	<ul style="list-style-type: none"> Physical exclusion Drop net Rocket net Sterilization Contraceptives Immobilization and euthanasia drugs Stationary and vehicle based sharp shooting Deer retrieval and removal 	<ul style="list-style-type: none"> No Effect
Piping Plover (T) (E) <i>Charadrius melodus</i>	Endangered in Oswego, Jefferson Threatened in Nassau, Queens, Suffolk	<ul style="list-style-type: none"> Occupy beaches from March through September for nesting and rearing young. Nests can be found on sandy beaches or in areas that have been filled with dredged sand, often near dunes in areas with little or no beach grass and inlet/overwash areas. 	<ul style="list-style-type: none"> Wildlife Services biologists are trained in bird identification and are aware of locations where the species breeds. White-tailed deer management activities are not expected to occur in habitats occupied by Piping Plover. Please visit http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B079 for additional information on Piping Plovers. 	<ul style="list-style-type: none"> Physical exclusion Drop net Rocket net Sterilization Contraceptives Immobilization and euthanasia drugs Stationary and vehicle based sharp shooting Deer retrieval and removal 	<ul style="list-style-type: none"> No Effect
American hart's-tongue fern (T) <i>Asplenium scolopendrium var. americana</i>	Madison, Onondaga,	<ul style="list-style-type: none"> This plant is found in a few discrete habitats in shaded, moist, northern deciduous forests growing in fissures in large rocks usually no more than a foot above the moist soil. May be found in limestone sinkholes, gorges or coulees. Prefers shaded, moist boulders and ledges. 	<ul style="list-style-type: none"> White-tailed deer management activities may occur in these habitats due to use of deciduous forests for foraging. Management of white-tailed deer would be beneficial for this species due to the potential decrease in browsing pressure and trampling Consult the NYSDEC Environmental Resource mapper at http://www.dec.ny.gov/imsmaps/ERM/viewer.htm to determine the locations of American's hart's- tongue fern. Contact the USFWS environmental staff for projects within American Hart's Tongue Fern habitat. 	<ul style="list-style-type: none"> Physical exclusion Drop net Rocket net Sterilization Contraceptives Immobilization and euthanasia drugs Stationary and vehicle based sharp shooting Deer retrieval and removal 	<ul style="list-style-type: none"> May affect, but not likely to adversely affect

Species	Counties	Habitat Characteristics	Habitat Comments	Methods	Determination
Chittenango ovate amber snail (T) <i>Novisuccinea chittenangoensis</i>	Madison	<ul style="list-style-type: none"> Occurs only along a 100 foot high waterfall within Chittenango State Park. 	<ul style="list-style-type: none"> White-tailed deer management activities will not occur on the vegetated slopes adjacent to the waterfall. 	<ul style="list-style-type: none"> Physical exclusion Drop net Rocket net Sterilization Contraceptives Immobilization and euthanasia drugs Stationary and vehicle based sharp shooting Deer retrieval and removal 	<ul style="list-style-type: none"> No Effect
Sandplain gerardia (E) <i>Agalinis acuta</i>	Nassau, Suffolk,	<ul style="list-style-type: none"> Plants are found along the coastline where it grows on the shifting sands between the dunes and the high tide mark. 	<ul style="list-style-type: none"> White-tailed deer management activities will occur on and around sand beaches and dunes. White-tailed deer damage management activities are directed at improving vegetative habitats in the long term by controlling deer browse None of the actions would be directed at the habitats preferred by Sandplain gerardia Consult the NYSDEC Environmental Resource mapper at http://www.dec.ny.gov/ismaps/ERM/viewer.htm to determine the locations of Sandplain gerardia Contact the USFWS environmental staff for projects within Sandplain gerardia habitat 	<ul style="list-style-type: none"> Physical exclusion Drop net Rocket net Sterilization Contraceptives Immobilization and euthanasia drugs Stationary and vehicle based sharp shooting Deer retrieval and removal 	<ul style="list-style-type: none"> May affect, but not likely to adversely affect
Small whorled pogonia (T) (Historic) <i>Isotria medeoloides</i>	Orange, Onondaga, Suffolk, Rockland, Washington	<ul style="list-style-type: none"> Small whorled pogonia is found in deciduous and mixed forests where it commonly occurs in moist, acidic soils overlying a fragipan on level to moderately sloping terrain near steeper slopes. Populations are frequently associated with dead wood and are often found in relatively open understories, although they can be found within stands of dense ferns. 	<ul style="list-style-type: none"> White-tailed deer management activities may occur in these habitats due to use of deciduous and mixed forests for foraging. Management of white-tailed deer would be beneficial for this species due to the potential decrease in browsing pressure and trampling Consult the NYSDEC Environmental Resource mapper at http://www.dec.ny.gov/ismaps/ERM/viewer.htm to determine the locations of American's hart's- tongue fern. Contact the USFWS environmental staff for projects within American Hart's Tongue Fern habitat. 	<ul style="list-style-type: none"> Physical exclusion Drop net Rocket net Sterilization Contraceptives Immobilization and euthanasia drugs Stationary and vehicle based sharp shooting Deer retrieval and removal 	<ul style="list-style-type: none"> May affect, but not likely to adversely affect

Species	Counties	Habitat Characteristics	Habitat Comments	Methods	Determination
Seabeach amaranth (T) <i>Amaranthus pumilus</i>	Nassau, Queens, Suffolk	<ul style="list-style-type: none"> Plants are found along the coastline where it grows on the shifting sands between the dunes and the high tide mark. 	<ul style="list-style-type: none"> White-tailed deer management activities will occur on and around sand beaches and dunes. White-tailed deer damage management activities are directed at improving vegetative habitats in the long term by controlling deer browse None of the actions would be directed at the habitats preferred by Seabeach amaranth Consult the NYSDEC Environmental Resource mapper at http://www.dec.ny.gov/ismaps/ERM/viewer.htm to determine the locations of Seabeach amaranth Contact the USFWS environmental staff for projects within Seabeach amaranth habitat 	<ul style="list-style-type: none"> Physical exclusion Drop net Rocket net Sterilization Contraceptives Immobilization and euthanasia drugs Stationary and vehicle based sharp shooting Deer retrieval and removal 	<ul style="list-style-type: none"> May affect, but not likely to adversely affect
Leedy's roseroot (T) <i>Rhodiola integrifolia</i> spp. <i>leedyi</i>	Schuyler, Yates	<ul style="list-style-type: none"> Grows on cool cliffs along the west shore of Seneca Lake. Prefers areas where cool air from caves comes to cliff surfaces through cracks. 	<ul style="list-style-type: none"> White-tailed deer management activities are not expected to occur on cliff surfaces 	<ul style="list-style-type: none"> Physical exclusion Drop net Rocket net Sterilization Contraceptives Immobilization and euthanasia drugs Stationary and vehicle based sharp shooting Deer retrieval and removal 	<ul style="list-style-type: none"> No effect
Northeastern bulrush (E) <i>Scirpus ancistrochaetus</i>	Steuben	<ul style="list-style-type: none"> Grows in seasonal pools, small ponds, beaver dams and other depression-related wet area. Prefers areas that are inundated with shallow water, or at least saturated, throughout much of the growing season. 	<ul style="list-style-type: none"> Prior to conducting White-tailed deer management activities in Steuben county persons will be advised to visit http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=Q21H for additional information. Coordinate with U.S. Fish and Wildlife Service New York Field Office for any projects anticipated to impact Northeastern Bulrush and their habitat. 	<ul style="list-style-type: none"> Physical exclusion Drop net Rocket net Sterilization Contraceptives Immobilization and euthanasia drugs Stationary and vehicle based sharp shooting Deer retrieval and removal 	<ul style="list-style-type: none"> May affect, but not likely to adversely affect

Species	Counties	Habitat Characteristics	Habitat Comments	Methods	Determination
Kemp's [=Atlantic] Ridley Sea Turtle (E) <i>Lepidochelys kempi</i>	Suffolk	<ul style="list-style-type: none"> Primarily occupy "neritic" habitats. Neritic zones typically contain muddy or sandy bottoms where prey can be found. 	<ul style="list-style-type: none"> White-tailed deer management activities are not expected to occur on sand beaches and dunes. Contact National Oceanic and Atmospheric Administration-Fisheries. 	<ul style="list-style-type: none"> Physical exclusion Drop net Rocket net Sterilization Contraceptives Immobilization and euthanasia drugs Stationary and vehicle based sharp shooting Deer retrieval and removal 	<ul style="list-style-type: none"> No effect
Green Sea Turtle (T) <i>Chelonia mydas</i>	Suffolk	<ul style="list-style-type: none"> Uses beaches for nesting. Open ocean convergence zones. Coastal areas for feeding. 	<ul style="list-style-type: none"> White-tailed deer management activities are not expected to occur on sand beaches and dunes. Contact National Oceanic and Atmospheric Administration-Fisheries. 	<ul style="list-style-type: none"> Physical exclusion Drop net Rocket net Sterilization Contraceptives Immobilization and euthanasia drugs Stationary and vehicle based sharp shooting Deer retrieval and removal 	<ul style="list-style-type: none"> No effect
Hawksbill Sea Turtle (E) <i>Eretmochelys imbricate</i>	Suffolk	<ul style="list-style-type: none"> Ledges and caves of coral reefs. 	<ul style="list-style-type: none"> White-tailed deer management activities are not expected to occur in habitats used by Hawksbill Sea Turtle. Contact National Oceanic and Atmospheric Administration-Fisheries. 	<ul style="list-style-type: none"> Physical exclusion Drop net Rocket net Sterilization Contraceptives Immobilization and euthanasia drugs Stationary and vehicle based sharp shooting Deer retrieval and removal 	<ul style="list-style-type: none"> No effect

Species	Counties	Habitat Characteristics	Habitat Comments	Methods	Determination
Leatherback Sea Turtle (E) <i>Dermochelys coriacea</i>	Suffolk	<ul style="list-style-type: none"> Primarily open ocean, but does forage in coastal waters. 	<ul style="list-style-type: none"> White-tailed deer management activities are not expected to occur in habitat used by Leatherback Sea Turtles. Contact National Oceanic and Atmospheric Administration-Fisheries. 	<ul style="list-style-type: none"> Physical exclusion Drop net Rocket net Sterilization Contraceptives Immobilization and euthanasia drugs Stationary and vehicle based sharp shooting Deer retrieval and removal 	<ul style="list-style-type: none"> No effect
Loggerhead Sea Turtle (T) <i>Caretta caretta</i>	Suffolk	<ul style="list-style-type: none"> Nests on beaches. Forages in coastal waters. 	<ul style="list-style-type: none"> White-tailed deer management activities are not expected to occur on sand beaches and dunes. Contact National Oceanic and Atmospheric Administration-Fisheries. 	<ul style="list-style-type: none"> Physical exclusion Drop net Rocket net Sterilization Contraceptives Immobilization and euthanasia drugs Stationary and vehicle based sharp shooting Deer retrieval and removal 	<ul style="list-style-type: none"> No effect
New England Cottontail (C) (Candidate for listing) <i>Sylvilagus transitionalis</i>	Columbia, Dutchess, Putnam, Westchester,	<ul style="list-style-type: none"> Early successional forest Thickets Thick tangled vegetation 	<ul style="list-style-type: none"> White-tailed deer management activities are not expected to adversely affect habitat of New England Cottontail. Consult the NYSDEC Environmental Resource mapper at http://www.dec.ny.gov/ismaps/ERM/viewer.htm to determine the locations of New England Cottontail habitat prior to working in listed counties. Management of white-tailed deer would be beneficial to habitat used by this species. 	<ul style="list-style-type: none"> Physical exclusion Drop net Rocket net Sterilization Contraceptives Immobilization and euthanasia drugs Stationary and vehicle based sharp shooting Deer retrieval and removal 	<ul style="list-style-type: none"> May affect, but not likely to adversely affect

Species	Counties	Habitat Characteristics	Habitat Comments	Methods	Determination
<p>Eastern massasauga rattlesnake (C)</p> <p>(Candidate for listing)</p> <p><i>Sistrurus catenatus catenatus</i></p>	Genesee, Onondaga,	<ul style="list-style-type: none"> Wet prairie, bogs and swamps Marshes and floodplain Open areas in wetlands with elevated hummocks for basking. 	<ul style="list-style-type: none"> White-tailed deer management activities are not expected to affect habitat of Eastern massasauga Consult the NYSDEC Environmental Resource mapper at http://www.dec.ny.gov/imsmaps/ERM/viewer.htm to determine the locations of Eastern massasauga habitat prior to working in listed counties. 	<ul style="list-style-type: none"> Physical exclusion Drop net Rocket net Sterilization Contraceptives Immobilization and euthanasia drugs Stationary and vehicle based sharp shooting Deer retrieval and removal 	<ul style="list-style-type: none"> No effect
<p>Bald Eagle (D)</p> <p>(delisted)</p> <p><i>Haliaeetus leucocephalus</i></p>	Albany, Allegany, Broome, Cattaraugus, Cayuga, Chautauqua, Clinton, Chemung, Chenango, Columbia, Cortland, Delaware, Dutchess, Erie, Essex, Franklin, Fulton, Genesee, Greene, Hamilton, Jefferson, Livingston, Monroe, Niagara, Onondaga, Ontario, Orange, Orleans, Oswego, Otsego, Putnam, Seneca, Rensselaer, Rockland, Saratoga, Seneca, Schenectady, Schoharie, Sullivan, St. Lawrence, Steuben, Tioga, Tompkins, Ulster, Wayne, Westchester, Wyoming, Yates	<ul style="list-style-type: none"> Nest in large structures, typically tall, live white pines trees near water. Nest is reused each year and can become as large as 8 feet deep, 6 feet across. Opportunistic feeders that are known to feed on carrion in addition to birds, mammals and turtles Sensitive to lead Susceptible to lead poisoning when feeding on carcasses of animals that have been shot with lead bullets 	<ul style="list-style-type: none"> White-tailed deer management activities are not expected to affect habitat of Bald Eagle. Consult with the NYSDEC if white-tailed deer management activities will occur near nesting locations during the breeding season. White-tailed deer management activities are not likely to pose the risk of lead poisoning to Bald Eagles due to very high recovery rate of deer that have been shot (432 deer were shot in FY2014 and only 2 deer were not recovered. At least one of these deer is alive). Entrails generally are bagged and disposed in a landfill or buried. Deer are primarily shot in the head and neck, thus lead fragments are in head and neck and not entrails. Consult the National Bald Eagle Management Guidelines http://www.fws.gov/midwest/eagle/pdf/NationalBaldEagleManagementGuidelines.pdf 	<ul style="list-style-type: none"> Physical exclusion Drop net Rocket net Sterilization Contraceptives Immobilization and euthanasia drugs Stationary and vehicle based sharp shooting Deer retrieval and removal 	<ul style="list-style-type: none"> May affect, but not likely to adversely affect

Species	Counties	Habitat Characteristics	Habitat Comments	Methods	Determination
Northern Long-Eared Bat (PE) <i>Myotis septentrionalis</i>	Albany, Allegany, Bronx, Broome, Cattaraugus, Cayuga, Chautauqua, Chemung, Chenango, Clinton, Columbia, Cortland, Delaware, Dutchess, Erie, Essex, Franklin, Fulton, Genesee, Greene, Hamilton, Herkimer, Jefferson, Lings, Lewis Livingston, Madison, Monroe, Montgomery, Nassau, New York, Niagara, Oneida, Onondaga, Ontario, Orange, Orleans, Oswego, Otsego, Putnam, Queens, Rensselaer, Richmond, Rockland, Saratoga, Schenectady, Schoharie, Schuyler, Seneca, Steuben, St. Lawrence, Suffolk, Sullivan, Tioga Tompkins, Ulster, Warren Washington, Wayne, Westchester, Wyoming Yates	<ul style="list-style-type: none"> • Roost individually or in colonies in crevices or holes within live or dead trees • Hibernate throughout winter in mines and caves with relatively high humidity, consistent temperatures, and no air currents 	<ul style="list-style-type: none"> • White-tailed deer management activities are not expected to affect habitat of Northern long-eared bat 	<ul style="list-style-type: none"> • Physical exclusion • Drop net • Rocket net • Sterilization • Contraceptives • Immobilization and euthanasia drugs • Stationary and vehicle based sharp shooting • Deer retrieval and removal 	<ul style="list-style-type: none"> • No effect
Red Knot (PT) <i>Calidris canutus</i>	Kings Nassau Queens Suffolk	<ul style="list-style-type: none"> • These long distance migratory birds require stopover habitats that are plentiful in foods that are easy to digest such as horseshoe crabs, juvenile clams, and mussels such that they can gain up to 10% of their body weight each day 	<ul style="list-style-type: none"> • White-tailed deer management activities are not expected to affect habitat of Red Knots 	<ul style="list-style-type: none"> • Physical exclusion • Drop net • Rocket net • Sterilization • Contraceptives • Immobilization and euthanasia drugs • Stationary and vehicle based sharp shooting • Deer retrieval and removal 	<ul style="list-style-type: none"> • No effect

Species	Counties	Habitat Characteristics	Habitat Comments	Methods	Determination
Swamp Pink (T) <i>Helonias bullata</i>	Wherever found	<ul style="list-style-type: none"> • Obligate wetland species • Occur along seepage areas and streams 	<ul style="list-style-type: none"> • White-tailed deer management activities are not expected to occur in wetlands along streams or seepage areas 	<ul style="list-style-type: none"> • Physical exclusion • Drop net • Rocket net • Sterilization • Contraceptives • Immobilization and euthanasia drugs • Stationary and vehicle based sharp shooting • Deer retrieval and removal 	<ul style="list-style-type: none"> • No effect



United States Department of the Interior

FISH AND WILDLIFE SERVICE

3817 Luker Road
Cortland, NY 13045



December 17, 2014

Mr. Martin Lowney
State Director - New York
USDA, APHIS, Wildlife Services
1930 Route 9
Castleton-on-Hudson, NY 12003

Attention: Ms. Kim Porter

Dear Mr. Lowney:

This responds to your October 1, 2014, letter regarding the statewide White-tailed Deer Damage Management Program in New York. This program is administered by the U.S. Department of Agriculture's Wildlife Services Agency (USDA) to assist landowners and other cooperators to control deer damage to crops and natural resources throughout the state.

Your letter requested that the U.S. Fish and Wildlife Service (Service) review the program pursuant to Section 7(a)(2) of the Endangered Species Act of 1973 (ESA) (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*). In addition, USDA provided an Environmental Assessment (EA) report documenting the proposed actions and potential impacts of the USDA Deer Damage Control Program. In an electronic mail from Ms. Kim Porter dated November 18, 2014, a revised ESA determination was provided to our office.

Methods used by USDA to control deer and deer damage in New York include exclusion (fencing), habitat management, supplemental feeding, animal behavior modification, repellants, live capture and translocation, euthanasia and shooting, or controlled administration of drugs to either anesthetize or cull problem animals. In some cases, an immunocontraceptive vaccine could be administered to reduce reproduction potential.

The USDA has determined that the proposed program will result in no effect to aquatic species including the federally endangered clubshell (*Pleurobema clava*), rayed bean (*Villosa fabalis*), dwarf wedgemussel (*Alasmidonta heterodon*), Kemp's Ridley sea turtle (*Lepidochelys kempi*), hawksbill sea turtle (*Eretmochelys imbricate*), leatherback sea turtle (*Dermochelys coriacea*), threatened loggerhead sea turtle (*Caretta caretta*), green sea turtle (*Chelonia mydas*),

Chittenango ovate amber snail (*Novisuccinea chittenangoensis*), or bog turtle (*Clemmys* [=*Glyptemys*] *muhlenbergii*) due to the terrestrial nature of the deer control program.

In addition, USDA has determined that there are several bird and bat species that will not be effected by the program including the federally endangered roseate tern (*Sterna dougallii dougallii*), Indiana bat (*Myotis sodalis*), threatened piping plover (*Charadrius melodus*), and proposed endangered northern long-eared bat (*Myotis septentrionalis*), and proposed threatened red knot (*Calidris canutus*) as management activities would not lead to take, harm, or harassment. In addition, the deer damage program will not result in an adverse impact to habitat.

The USDA has determined that the proposed action may affect but would not adversely affect the following endangered plants – Northeastern bulrush (*Scirpus ancistrochaetus*) or sandplain gerardia (*Agalinis acuta*). Likewise, the same determination was made for the following threatened plants – American harts-tongue fern (*Asplenium scsolopendrium* var. *americana*), Eastern prairie fringed orchid (*Platanthera leucophea*), Houghton’s goldenrod (*Solidago houghtonii*), Leedy’s roseroot (*Rhodiola integrifolium* ssp. *leedyi*), Northern wild monkshood (*Aconitum noveboracense*), seabeach qamaranth (*Amaranthus pumilus*), small-whorled pogonia (*Isotria medeoloides*), and swamp pink (*Helonias bullata*).

Reduced herbivory will benefit populations of wild lupine, the preferred nectar plant of the endangered Karner blue butterfly (*Lycaeides melissa samuelis*). Accordingly, the USDA determined that the program may affect, but would not likely adversely affect this species. The same determination was made for the candidate New England cottontail (*Sylvilagus transitionalis*) as deer control could improve this species’ habitat conditions. The Eastern massasauga rattlesnake (*Sistrurus catenatus catenatus*), also a candidate species, is not expected to be affected by the various methods to be employed by USDA.

The Service concurs with your determination that the proposed project is not likely to adversely affect the above-listed species. No further coordination or consultation under the ESA is required with the Service at this time. Should project plans change, or if additional information on listed or proposed species or critical habitat becomes available, this determination may be reconsidered. The most recent compilation of federally-listed and proposed endangered and threatened species in New York is available for your information. Until the proposed project is complete, we recommend that you check our website every 90 days from the date of this letter to ensure that listed species presence/absence information for the proposed project is current.*

In addition to the above-referenced determinations regarding federally-listed or proposed species, the USDA has also determined that the project will result in no effects to the bald eagle (*Haliaeetus leucocephalus*). As you are aware, bald eagles have been delisted pursuant to the ESA, but remain protected under the Migratory Bird Treaty Act (40 Stat. 755; 16 U.S.C. 703-712), the Bald and Golden Eagle Protection Act (BGEPA) (54 Stat. 250, as amended; 16 U.S.C. 668 *et seq.*), and by the state of New York. If eagles are found within the project area, the Service recommends that the USDA follow the Bald Eagle Management Guidelines found on our website.

The above-listed species are also listed by the state of New York. Any additional information regarding the proposed project and its potential to impact listed species should be coordinated with both this office and with the New York State Department of Environmental Conservation.

Thank you for your time. If you require additional information or assistance please contact Tim Sullivan at (607) 753-9334. Future correspondence with us on this project should reference project file 15I0005.

Sincerely,

for 
David A. Stilwell
Field Supervisor

*Additional information referred to above may be found on our website at:
<http://www.fws.gov/northeast/nyfo/es/section7.htm>

cc: NYSDEC, Albany, NY (Wildlife Diversity)