ENVIRONMENTAL ASSESSMENT

MAMMAL DAMAGE MANAGEMENT IN THE STATE OF NEW YORK

Prepared by:

United States Department of Agriculture
Animal and Plant Health Inspection Service
Wildlife Services

In cooperation with:

New York State Department of Environmental Conservation, Fish and Wildlife

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

New York State Department of Agriculture and Markets

New York City Department of Environmental Protection

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ACRONYMS

APHIS	Animal and Plant Health Inspection Service
AVMA	American Veterinary Medical Association
CEQ	Council on Environmental Quality
CSA	Cooperative Service Agreement
CWA	Clean Water Act
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
FEMA	Federal Emergency Management Agency
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FONSI	Finding of No Significant Impact
IWDM	Integrated Wildlife Damage Management
MDM	Mammal Damage Management
MOU	Memorandum of Understanding
NASS	National Agricultural Statistics Service
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NWCO	Nuisance Wildlife Control Operators
NWRC	National Wildlife Research Center
NYCDEP	New York City Department of Environmental Protection
NYSDAM	New York State Department of Agriculture and Markets
NYSDEC	New York State Department of Environmental Conservation, Bureau of Wildlife
ORV	Oral Rabies Vaccination
SOP	Standard Operating Procedure
T&E	Threatened and Endangered
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
WS	Wildlife Services

CHAPTER 1: NEED FOR ACTION AND SCOPE OF ANALYSIS

1.1 INTRODUCTION

Across the United States, habitat has been substantially changed as human populations expand and land is used for human needs. These human uses and needs often compete with the needs of animals which increases the potential for conflicting human/animal interactions. This Environmental Assessment (EA) evaluates the potential environmental effects of alternatives for Wildlife Services' involvement in mammal damage management in New York. The U.S. Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Wildlife Services (WS) program is the federal agency authorized to protect American resources from damage associated with wildlife (the Act of March 2, 1931 (46 Stat. 1468; 7 U.S.C. 8351-8352) as amended, and the Act of December 22, 1987 (101 Stat. 1329-331, 7 U.S.C. 8353)). Human/animal conflict issues are complicated by the wide range of public responses to animals and animal damage. What may be unacceptable damage to one person may be a normal cost of living with nature to someone else. The relationship in American culture of values and damage can be summarized in this way:

> *Animals have either positive or negative values, depending on varying human perspectives and circumstances (Decker and Goff 1987). Animals are generally regarded as providing economic, recreational and aesthetic benefits, and the mere knowledge that animals exist is a positive benefit to many people. However, the activities of some animals may result in economic losses to agriculture and damage to property. Sensitivity to varying perspectives and values is required to manage the balance between human and animal needs. In addressing conflicts, managers must consider not only the needs of those directly affected by damage but a range of environmental, sociocultural and economic considerations as well.*

WS' activities are conducted to prevent or reduce animal damage to agricultural, industrial, and natural resources, and to property, livestock, and threats to public health and safety on private and public lands in cooperation with federal, state and local agencies, tribes, private organizations, and individuals. The WS program uses an integrated approach (WS Directive 2.105[1]) in which a combination of methods may be used or recommended to reduce damage. Program activities are not based on punishing offending animals but are conducted to reduce damage and risks to human and livestock health and safety, and are used as part of the WS Decision Model (Slate et al. 1992).

WS is a cooperatively funded, service-oriented program that receives requests for assistance with damage caused by animals from private and public entities, including tribes and other governmental agencies. As requested, WS cooperates with land and animal management agencies to reduce damage effectively and efficiently in accordance with applicable federal, state, and local laws, Memoranda of Understanding (MOUs), and partnership agreements between WS and other agencies.

WS 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 direct, indirect, and cumulative impacts. In addition, this EA has been prepared to evaluate a range of alternatives to meet the need for action while addressing the issues associated with mammal damage management (MDM). Pursuant to the National Environmental Policy Act (NEPA) and the Council on Environmental Quality (CEQ) regulations, WS is preparing this EA to document the analyses associated

[1] The WS Program Directives (https://www.aphis.usda.gov/aphis/ourfocus/wildlifedamage/sa_ws_program_directives/ct_ws_dir_ch2) provides guidance for WS personnel to conduct wildlife damage management activities. WS Directives referenced in this EA can be found in the manual or link provided but are not referenced in the Literature Cited Appendix.

with proposed federal actions and to inform decision-makers and the public of reasonable alternatives capable of avoiding or minimizing significant effects. This EA will also serve as a decision-aiding mechanism to ensure that the policies and goals of the NEPA are infused into the actions of the agency[2].

The WS-New York (WS-NY) program continues to receive requests for assistance or anticipates receiving requests for assistance to resolve or prevent damage or threats associated with Virginia opossum (*Didelphis virginiana*), American beaver (*Castor canadensis*), muskrat (*Ondatra zibethicus*), woodchuck (*Marmota monax*), eastern chipmunk (*Tamias striatus*), eastern gray squirrel (*Sciurus carolinensis*), red squirrel (*Tamiasciurus hudsonicus*), northern flying squirrel (*Glaucomys sabrinus*), southern flying squirrel (*Glaucomys volans*), eastern cottontail (*Sylvilagus floridanus*), New England cottontail (*Sylvilagus transitionalis*), feral swine (*Sus scrofa*), American bison (*Bison bison*), bobcat (*Lynx rufus*), coyote (*Canis latrans*), red fox (*Vulpes vulpes*), gray fox (*Urocyon cinereoargenteus*), black bear (*Ursus americanus*), raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), least weasel (*Mustela nivalis*), long-tailed weasel (*Mustela frenata*), short-tailed weasel (*Mustela erminea*), mink (*Mustela vison*), American marten (*Martes americana*), fisher (*Martes pennanti*), river otter (*Lontra canadensis*), feral/free-ranging (domestic) cat (*Felis domesticus*), and small mammals, such as shrews and moles (order *Eulipotyphla*), rodents (mice, rats, and voles) (order *Rodentia*), and bats (order *Chiroptera*)

Because of the high volume of requests for technical and direct assistance with deer and the special considerations for their populations in New York, white-tailed deer will not be included in this EA. Rather, information regarding damage management for white-tailed deer in New York can be found in its own separate EA (USDA 2015*a*).

1.2 NEED FOR ACTION

Some species of wildlife have adapted to thrive in human altered habitats. Those species, in particular, are often responsible for the majority of conflicts between people and wildlife that lead to requests for assistance to reduce damage to resources and to reduce threats to the safety of people. Both sociological and biological carrying capacities must be applied to resolve wildlife damage problems. The 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 (Hardin 1986). 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). These 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 habitat may have a biological carrying capacity to support higher populations of wildlife, in many cases the wildlife acceptance capacity is lower or has been met (Hardin 1986). 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 (Leopold 1933, 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

[2]After 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 (EIS) or a Finding of No Significant Impact (FONSI) will be noticed to the public in accordance to NEPA and the Council of Environmental Quality regulations.

derived from the specific threats to resources. The need for action to manage damage and threats associated with mammals arises from requests for assistance[3] received by WS to reduce and prevent damage associated with mammals from occurring to four major categories: agricultural resources, natural resources, property, and threats to human health and safety. WS has identified those mammal species most likely to be responsible for causing damage to those four categories based on previous requests for assistance. Table 1.1 lists WS' technical assistance consultations involving mammal damage or threats of damage to those four major resource types from the federal fiscal year[4] (FY) 2012 through FY 2016. Technical assistance is provided by WS to those persons requesting assistance with resolving damage or the threat of damage by providing information and recommendations on mammal damage management activities that can be conducted by the requestor without WS' direct involvement in managing or preventing the damage. WS' technical assistance activities will be discussed further in Chapter 2 of this EA. Table 1.1 does not include direct operational assistance projects where WS was requested to provide assistance through the direct application of methods.

The technical assistance consultations conducted by WS are representative of the damage and threats that are caused by mammals. Technical assistance consultations conducted by WS from FY 2012 through FY 2016 included feral swine (81.4%), coyote (4.5%), raccoon (4.4%), and beaver (2.8%) as the four species with the most service requests.

Table 1.1 - WS' Technical assistance consultations conducted in New York, FY 2012-FY 2016.

Species	Projects	Species	Projects
Beaver	37	Muskrat	2
Black Bear	3	Norway Rat*	1
Cat (feral/free ranging)	10	Raccoon	58
Cottontail Rabbit	1	Red Fox	6
Coyote	60	Red Squirrel	7
Eastern Chipmunk	6	Shrews (all)	2
Feral Swine*	1,079	Striped Skunk	24
Fisher	5	Virginia Opossum	3
Mouse (deer/house)	3	Vole (all)	2
Mink	2	Woodchuck	12
Mole (all)	2	TOTAL	1,325

*Feral swine and Norway rat are introduced invasive species.

Table 1.2 lists the resource types to which mammal species can cause damage. Many of the mammal species can cause damage to or pose threats to a variety of resources. Most requests for assistance received by WS are associated with those mammal species causing damage or threats of damage to property and human health and safety. For example, many of those mammal species listed in Table 1.2 are potential vectors for zoonotic diseases or can damage property, such as houses, lawns, and businesses or damage infrastructure, such as dams, through digging and burrowing.

[3] WS only conducts mammal damage management after receiving a request for assistance. Before initiating mammal damage activities, a Memorandum of Understanding, cooperative service agreement, or other comparable document must be signed between WS and the cooperating entity which lists all the methods the property owner or manager will allow to be used on property they own and/or manage.

[4] The federal fiscal year begins on October 1 and ends on September 30 the following year.

Table 1.2 - Mammal species addressed in the EA with WS requests for technical assistance received and the resource type damage by those species, from 2012 to 2016. Resource types: A=Agriculture, N=Natural Resources, P=Property, H=Human Health and Safety.

Species	Resource				Species	Resource			
	A	N	P	H		A	N	P	H
Beaver		X	X	X	Muskrat			X	X
Black Bear	X				Norway Rat*			X	
Cat (feral/free ranging)		X	X	X	Raccoon	X	X	X	X
Cottontail Rabbit			X	X	Red Fox	X			X
Coyote	X		X	X	Red Squirrel			X	
Eastern Chipmunk			X	X	Shrews (all)			X	X
Feral Swine*	X	X	X	X	Striped Skunk	X		X	X
Fisher	X				Virginia Opossum	X		X	
Mouse (deer/house)			X	X	Vole (all)			X	X
Mink	X				Woodchuck			X	X
Mole (all)			X	X					

*Feral swine and Norway rat are introduced invasive species.

Need for Mammal Damage Management to Protect Human Health and Safety

Human health and safety concerns and problems associated with mammals include, but are not limited to, the potential for transmission of zoonotic diseases to humans, mammal hazards at airports, and risks and actual instances of mammals injuring humans.

Although rare, attacks to humans by mammal species can occur and are always a concern. Bears and coyotes are two species that pose the largest threat to physically harm humans in New York. Incidences usually occur when the animal becomes accustomed to human behaviors or has easy access to a human-generated food source. Attacks can also occur from animals that suffer from diseases such as distemper or rabies, which often causes the animal to lose their fear of humans.

Zoonoses (*i.e.*, wildlife diseases transmissible to people) are a major concern of cooperators when requesting assistance with managing threats from mammals. Disease transmission can not only occur from direct interactions between humans and mammals but from interactions with pets and livestock that have direct contact with mammals. Pets and livestock often encounter and interact with mammals which can increase the opportunity of transmission of disease to humans. Table 1.3 depicts common diseases affecting humans that can be transmitted by mammals in addition to diseases which affect other animals, including domestic species. These include viral, bacterial, mycotic (fungal), protozoal, and rickettsial diseases.

Table 1.3 - Wildlife diseases in the Eastern United States that pose potential health risks through transmission to humans (Beran 1994, Davidson 2006)*.

Disease	Causative Agent	Hosts†	Human Exposure
Anthrax	*Bacillus antracis*	cats	inhalation, ingestion
Tetanus	*Clostridium tetani*	mammals	direct contact
Dermatophilosis	*Dermatophilus congolensis*	mammals	direct contact
Pasteurellaceae	*Haemophilus influenzae*	mammals	bite or scratch
Salmonellosis	*Salmonella* spp.	mammals	ingestion
Yersinosis	*Yersinia* spp.	cats	ingestion
Chlamydioses	*Chlamydophilia felis*	cats	inhalation, direct contact
Typhus	*Rickettsia prowazekii*	opossums	inhalation, ticks, fleas
Sarcoptic mange	*Sarcoptes scabiei*	red fox, coyotes	direct contact
Trichinosis	*Trichinella spiralis*	raccoons, fox	ingestion, direct contact
Rabies	Rhabidovirus	mammals	direct contact
Visceral larval	*Baylisascaris procyonis*	raccoons, skunks	ingestion, direct contact
Leptospirosis	*Leptospira interrogans*	mammals	ingestion, direct contact
Echinococcus	*Echinococcus multilocularis*	fox, coyotes	ingestion, direct contact
Toxoplasmosis	*Toxoplasma ondii*	cats, mammals	ingestion, direct contact
Spirometra	*Spirometra mansonoides*	bobcats, raccoons, fox	ingestion, direct contact
Giardiasis	*Giardia lamblia, G. Duodenalis*	beaver, coyotes, cats	ingestion, direct contact
Lyme disease	*Borellia burgdorferi*	mammals	tick bite (vectored by deer)
Tularemia	*Francisella tularensis*	rodents, rabbits	direct contact, ingestion, inhalation
Hantavirus	Hantaviruses	rodents	direct contact, ingestion, inhalation

*Table 1.3 is not considered an exhaustive list of wildlife diseases that are considered infectious to humans that are carried by wildlife species. The zoonoses provided are the more common infectious diseases for the species addressed in this EA and are only a representation of the approximately 100 to 3,000 zoonoses known to exist.

† The host species provided for each zoonosis includes only those mammalian species addressed in this EA unless the zoonoses listed potentially infects a broad range of mammalian wildlife.

Zoonoses infecting a broad range of mammals are denoted by the general term "mammals" as the host species. The diseases listed do not necessarily infect only those mammalian species covered under this EA but likely infect several species of mammals or groups of mammals. For a complete discussion of the more prevalent diseases in free-ranging mammals, please refer to Beran (1994) and Davidson (2006).

Individuals or property owners that request assistance with mammals 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, from animals acting out of character, or from animals showing no fear when humans are present.

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 mammals. Thus, it is the risk of disease transmission that is the primary reason for requesting and conducting wildlife management to lessen the threat of disease transmission. Situations where the threat of disease associated with wild or feral mammal populations may include:

- Potential exposure of residents to rabies due to the presence of bats in residential homes and publicly owned buildings such as schools.
- Potential exposure of humans to rabies posed by skunks denning and foraging in a residential community or from companion animals coming in contact with infected skunks.
- Concern about the threat of histoplasmosis from the disturbance of a large deposit of guano in an attic or other confined space where a large colony of bats routinely roosts or raise young.
- Accumulated droppings from denning or foraging raccoons and subsequent exposure to raccoon roundworm in fecal deposits in a suburban community or at an industrial site where humans work or live in areas of accumulation.

Beaver damming activity creates conditions favorable to certain types of mosquitoes and can hinder mosquito control efforts or result in population increases of these insects (Wade and Ramsey 1986). While the presence of these insects is largely a nuisance, mosquitoes can transmit diseases such as West Nile Virus (WNV) and eastern equine encephalitis (EEE) (Mallis 1982) (Lindsey et al. 2014) (Center for Disease Control (CDC) 2000). In New York, WNV was first identified in 1999. Since 2000, there have been a total of 490 reported human cases leading to 37 deaths. Eastern equine encephalitis is much less common in New York but is more fatal than WNV, with about one-third of patients developing EEE suffering death and many survivors of the virus developing mild to severe brain damage. There have been five cases of EEE reported in New York since 1971, all occurring in Oswego and Onondaga counties, with the most recent case reported in 2011. All five cases were fatal (NYS Department of Health 2016).

Additionally, beavers are potential carriers of the intestinal parasite *Giardia lamblia*, which can contaminate human water supplies and cause outbreaks of the disease Giardiasis in humans (Woodward 1983, Beach and McCulloch 1985, Wade and Ramsey 1986, Miller and Yarrow 1994). The CDC has recorded at least 41 outbreaks of waterborne Giardiasis, affecting more than 15,000 people. Beavers are also known carriers of tularemia, a bacterial disease that is transmittable to humans through bites by arthropod vectors or infected animals or by handling animals or carcasses which are infected (Wade and Ramsey 1986). Feng et al. 2007 reported that beavers tested positive for a Crytosporidium (a parasite that causes diarrheal diseases) genotype that has also been found in humans, thus creating the possibility of transmission. Lastly, on rare occasions, beavers may contract the rabies virus and attack humans. In February 1999, a beaver attacked and wounded a dog and chased some children that were playing near a stream in Vienna, Virginia. Approximately a week later, a beaver was found dead at the site and tested positive for rabies (T. Menke, WS-Virginia, personal communication, 2003).

Increasing populations of raccoons have been implicated in the outbreak of distemper in certain areas (Majumdar et al. 2005). Distemper has not been identified as transmissible to humans. However, cooperators who feel threatened by the possibility of disease transmission often request assistance after observing sick raccoons on their property. Symptoms of distemper often lead to abnormal behavior in raccoons that are similar to symptoms associated with rabies. Raccoons with distemper often lose their fear of humans and can act aggressively which increases the risk that people, livestock, or companion animals may be bitten. Distemper is also known to occur in coyotes, red fox, and gray fox.

In addition to rabies, feral/free ranging (domestic) cats can carry other zoonoses including cat scratch disease (fever) (*Bartonella henselae*), Salmonella (*Salmonella* spp.), murie typhus (*Rickettseia typhi*), plague (*Yersinia pestis*), tularemia (*Francisella tularensis*), toxoplasmosis (*Toxoplasma gondii*), hookworm (*Uncinaria sterocephala*, *Ancylostoma tubaeforme*, *Ancylostoma braziliense*, *Ancylostoma ceylanicum*), and raccoon roundworm (*Baylisascaris procyonis*) (Gerhold and Jessup 2012). People of high risk to these zoonoses are children under the age of five, pregnant women, adults over 65, and persons with weakened immune systems (*e.g*., cancer patients undergoing chemotherapy) (CDC 2016).

Feral swine are known to carry numerous parasites and diseases which may be transmitted to humans including brucellosis, leptospirosis, salmonellosis, toxoplasmosis, bovine tuberculosis, influenza and *Escherichia coli* (West et al. 2009, Hutton et al. 2006). Infection may result from direct exposure to swine (*e.g*., hunters handling carcasses), through contamination of food crops (California Food Emergency Response Team 2007), or through secondary infection of a third host (West et al. 2009).

The following section includes only some examples of zoonotic diseases for which WS could provide surveillance or management assistance. It is not intended to be an exhaustive discussion of all potential zoonoses for which WS could provide assistance.

Tick Borne Diseases: There are numerous tick borne diseases that have been documented as occurring in New York including Lyme disease, babesiosis, ehrlichiosis, and Rocky Mountain spotted fever. 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).

Tularemia: Tularemia, also known as rabbit fever, is a disease caused by the bacterium *Fracisella tularensis*. Tularemia typically infects animals such as rodents, rabbits, and hares. Usually, people become infected through the bite of infected ticks or tabanid flies, by handling infected sick or dead animals, by eating or drinking contaminated food or water, or by inhaling airborne bacteria. About 200 human cases of tularemia are reported each year in the U.S, and nine cases have been confirmed in New York between 2005 and 2015 (CDC 2016).

Raccoon Roundworm (*Baylisascaris procyonis*, BP): Roundworms are a common parasite that can be found in the small intestine of raccoons which causes severe or fatal encephalitis in a variety of birds and mammals, including humans (CDC 2011). BP also causes eye and organ damage in humans. Humans become infected with BP by ingesting soil or other materials (*e.g*., bark or wood chips) contaminated with raccoon feces containing BP eggs. Young children are at particular risk for infection as a result of behaviors such as placing potentially contaminated fingers and objects like toys into their mouths (CDC 2011). Raccoons are the primary host for the roundworm, but other animals including birds and small mammals can also be infected. It is suspected that raccoon roundworm is an important factor in the extirpation of the Alleghany woodrat from NYS, which is a state listed species (C. Nadareski, NYCDEP, personal communication, 2017). Predator animals including dogs may also become infected by eating animals that are infected. In some dogs, *Baylisascaris* may develop to adult worms and pass eggs in the dogs' feces (CDC 2011). Despite the prevalence of infection in raccoons, infection of humans is rare and less than 25 cases have been documented in the U.S. Cases have been reported in California, Illinois, Louisiana, Massachusetts, Michigan, Minnesota, Missouri, New York, and Pennsylvania. As of 2008, there were 15 reported human neurological cases in the US; 5 of the infected persons died (CDC 2011).

Rabies: Rabies is an acute, fatal viral disease of mammals most often transmitted through the bite of a rabid animal. Rabies is preventable, but it is fatal without prior vaccination or post-exposure treatment. In 2015 there were 365 cases of rabid mammals documented in New York (Davis and Rudd 2015). Bats, cats, and raccoons made up the majority of positively tested animals with 51%, 17%, and 10% respectively. Infected animals have often lost their wariness of humans and therefore show more aggressive behavior towards people, posing a threat to human health and safety. More information pertaining to rabies can be found through our National Rabies Management Program (https://www.aphis.usda.gov/aphis/ourfocus/wildlifedamage/programs/nrmp/ct_rabies).

Disease Surveillance and Monitoring

Public awareness and health risks associated with zoonoses have increased in recent years. Several zoonotic diseases associated with mammals are addressed in this EA. Those zoonotic diseases remain a concern and continue to pose threats to human health and safety where people encounter mammals. WS has received requests to assist with reducing damage and threats associated with several mammal species and could conduct or assist with disease monitoring or surveillance activities for any of the mammal species addressed in this EA. Most disease sampling occurs ancillary to other wildlife damage management activities (*i.e*., disease sampling occurs after wildlife have been captured or lethally removed for other purposes). For example, WS may collect blood samples from any mammal species that were lethally removed to alleviate damage occurring to property to test for tularemia.

Need for Mammal Damage Management at Airports

Airports provide ideal conditions for many wildlife species due to the large grassy areas adjacent to brushy, forested habitat used as noise barriers. Access to most airport properties is restricted so wildlife living within airport boundaries are protected during hunting and trapping seasons and are insulated from many other human disturbances.

The civil and military aviation communities have acknowledged that the threat to human safety from aircraft collisions with wildlife is increasing (Dolbeer et al. 2016). 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). Aircraft collisions with wildlife can also erode public confidence in the air transport industry as a whole (Conover et al. 1995).

Between 1990 and 2014 in the United States, 3,360 aircraft strikes were reported involving terrestrial mammals and 1,264 involved bats (Dolbeer et al. 2015). The number of mammal strikes actually occurring is likely to be much greater, since an estimated 80% of civil wildlife strikes go unreported (Cleary et al. 2000) and terrestrial mammal species with body masses less than one kilogram (2.2 pounds) are excluded from the database (Dolbeer et al. 2015). Civil and military aircraft have collided with a reported 62 mammal species (41 terrestrial and 21 bat) from 1990 through 2014 (Dolbeer et al. 2015).

In New York, there were 111 reported strikes with mammals from January 1, 2000 through May 1, 2016 (FAA 2016). Forty-four of the mammal strikes involved bats, while 67 were terrestrial mammals (Table 1.4). These strikes accumulated a total of $1,500,680 in damage (FAA 2016). Preventing damage and reducing threats to human safety is the goal of those cooperators requesting assistance at airports given that a potential strike can lead to the loss of human life and considerable damage to property.

Table 1.4 - Mammal species reported struck by aircraft in New York from 1/1/2000 - 5/1/2016.

Species	# Reports	Species	# Reports
Bats (all)	44	Raccoon	6
Beaver	1	Red Fox	9
Coyote	14	Striped Skunk	5
Domestic Cat	2	Virginia Opossum	13
Eastern Cottontail Rabbit	4	Woodchuck	5
Gray Fox	1	Other/Unidentified	1
Muskrat	6	TOTAL	111

Wildlife populations near or found 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 the 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 populations inside the fence do not exhibit nor have unique characteristics from those outside the fence and do not warrant consideration as a unique population under this analysis.

Need for Mammal Damage Management to Protect Agricultural Resources

WS receives requests for assistance from agricultural producers experiencing damage problems from mammals including, but not limited to: predation of livestock, including poultry, by coyotes and foxes; damage to crops and stored feed by woodchucks, raccoons and rodents; and risk of disease transmission.

New York is an agricultural state with over 7 million acres being farmed (23% of the state's land). It is currently ranked number one and number two nationally in yogurt and apple production, respectively. Livestock and dairy production contribute substantially to the state's economy with milk production alone valuing at an estimated $3.49 billion in 2014. There were an estimated 610,000 milk cows, 110,000 beef cows, 69,000 pigs, 62,000 sheep, and 4,497,000 chickens in New York in 2012 (NASS 2014).

In 2010 in the United States, the National Agriculture Statistics Service (NASS) (2011) reported that 219,900 cattle and calves were lost due to predation with an estimated monetary value of $98,475,000. In New York, predators killed a reported 300 cattle and 1,400 calves in 2010 for an estimated monetary value of $659,000. Coyotes were the most common predator representing 7.3% of cattle losses (86.6% were reported as unknown predators) and 88.5% of calf losses (NASS 2011). The NASS also reported that 400 sheep and 1,300 lambs were lost to predation in New York in 2009, resulting in $147,000 in monetary losses (NASS 2010). New York livestock producers reported using a number of non-lethal methods to reduce losses of cattle and calves due to predators including the use of exclusion and fencing (51.0%), guard animals (23.8%), and livestock carcass removal (11.5%) (NASS 2011).

Some of the most destructive mammals to agricultural resources included in this EA are raccoons and feral swine. This is not an uncommon problem; Conover (2002) estimated that wildlife-related losses of agricultural commodities on a national scale exceeds $4.5 billion in revenue annually. Feral swine can impact crops directly by consumption and indirectly through behaviors such as rooting, trampling and wallowing. Raccoons commonly damage field and sweet corn crops and have been shown to reduce their home ranges during the period when corn is most attractive to them (Beasley and Rhodes 2008). When surveying corn fields for damage, a study in northern Indiana found that 87% of damage events were attributed to raccoons (DeVault et al. 2007). Also, Beasley and Rhodes (2008) found a significant positive relationship between corn damage and raccoon abundance.

Additionally, cottontail rabbits and voles are reported to damage orchard trees by gnawing at the base of the tree. Trees are badly damaged or the bark is girdled and trees die when feeding by rabbits and voles is severe (Gill 1992). Similar damage occurs in nurseries, which grow landscape ornamentals and shrubs.

Being omnivorous, black bears have the potential to impact many different agricultural commodities including corn, livestock, and apiaries. In Wisconsin bear damage to corn has increased from 10% from 1939-1956 to 65% damage claims from 1986-1990. This is likely a consequence of using short-maturity corn varieties, started in the late 1970s. Bear damage costs total about $250,000 annually among 23 counties of Wisconsin (Stowell and Willging 1992). A Massachusetts survey asked agricultural producers their perceptions of bears and associated bear damage. Livestock and corn producers expressed that bear damage was low to moderate while beekeepers thought their losses were substantial to severe. Most damage cost estimates by producers were less than $1,000 per year (Jonker et al. 1998).

River otters and mink, and to a lesser extent bears and raccoons may prey on fish and other cultured species at hatcheries and aquaculture facilities (Bevan et al. 2002). River otters may even prey on fish in marine aquaculture facilities (Goldburg et al. 2001).

Mammals can also facilitate the spread of diseases to livestock, for example, feral swine are potential reservoirs for 30 viral and bacterial diseases as well as 37 parasites that threaten the health of livestock and humans (Hutton et al 2006). Of greatest concern is infection of swine production facilities with diseases like swine brucellosis, pseudorabies, and leptospirosis. Other diseases carried by feral swine include hog cholera, tuberculosis, bubonic plague, and anthrax (Beach 1993).

Need for Mammal Damage Management to Protect 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 resources may be plants or animals, including threatened and endangered (T&E) species or habitats in general. Examples of natural resources in New York include: parks, forest preserves, wildlife management areas, 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.

Mammals have been identified to cause damage to natural resources in certain situations. Mammals causing damage are often locally overabundant at the damage site and threaten the welfare of a species' population identified as a natural resource. Predation can be especially harmful towards species with low productivity and declining populations. The presence of even a single predator at a nest site can result in the direct mortality of adult birds, chicks and eggs or cause birds to abandon active nests and the nesting site entirely (Erwin et al. 2001, Hall and Kress 2004). An example of this in New York would be predation of common terns (*Sterna hirundo*), least terns (*Sternula antillarum*) and piping plovers (*Charadrius melodus*) at their nests by several predator species. Virginia opossum, coyote, fox, raccoon, mink, striped skunk, cat, rodents (*i.e.*, rats) and other mammals are known or suspected to reduce breeding success of piping plovers (Patterson et al. 1991, Boettcher et al. 2007, Daisey 2009, Wilke 2011, Wilke 2012), and terns (Erwin et al. 2001, Kress and Hall 2004, Daisey 2009). WS' has several reports on record of raccoons damaging piping plover and roseate tern nests in New York during the 2013 breeding season.

Raccoons can particularly impact T&E species with their opportunistic foraging behavior and innovative demeanor. Ground nesting birds, such as the piping plover, create easy prey opportunities for raccoons. Raccoons accounted for 28.6% of the nest depredation of piping plovers on Assateague Island (Maryland/Virginia) and were found to be the major predator at one of the study sites, destroying 11 of 14 nests (Patterson et al. 1991). In addition, raccoons have been reported preying upon peregrine falcon and barn owl nestlings as well as diamond-back terrapin eggs in New York (C. Nadareski, NYCDEP, personal communication, 2017). Raccoon roundworm also plays a role with the listed Alleghany woodrat in New York and is suspected to be an important factor in the extirpation of this species, as previously mentioned. Raccoons can have devastating effects on T&E species and must be viewed as a potential threat when considering conservation efforts to revive species of special concern.

Beaver can impact natural resource communities more indirectly. While beaver ponds and the habitat they create can be beneficial for some species of wildlife, beaver activities can also destroy other critical habitat types (*e.g.*, free-flowing streams, riparian areas, bird roosting and nesting areas) that are important to sensitive wildlife species. For example, certain species of fish and mussels are dependent on clear, cool and/or fast moving water. Where beaver are abundant, they may restrict water flow to downstream natural areas thereby impacting wildlife populations. Freshwater mussels are the most imperiled group of

animals in the U.S. (Carey et al. 2015, Freshwater Mollusk Conservation Society) and their life history can be hindered by beaver activities.

Scientists estimate that, nationwide, domestic cats kill hundreds of millions of birds and more than a billion small mammals, such as rabbits, squirrels, and chipmunks, each year. Cats kill common species such as cardinals, blue jays, and house wrens, as well as rare and endangered species such as piping plovers (American Bird Conservancy (ABC) 2005). Some feral and free-ranging cats kill more than 100 animals each year. One well-fed cat that roamed a wildlife experiment station was recorded to have killed more than 1,600 animals (mostly small mammals) over 18 months (ABC 2005). Researchers at the University of Wisconsin coupled their four-year cat predation study with the data from other studies, and estimated that rural feral and free-ranging cats kill at least 7.8 million and perhaps as many as 217 million birds a year in Wisconsin. In some parts of the state, feral and free ranging cat densities reached 114 cats per square mile, outnumbering all similar-sized native predators (Coleman et al. 1997). Most recently, Loss et al. (2013) estimated that feral/free-ranging cats kill 1.4 to 3.7 billion birds and 6.9 to 20.7 billion mammals worldwide annually including, without a doubt, many T&E species.

Feral swine have a negative effect on "almost all aspects of ecosystem structure and function" (Jolley et al. 2010). The greatest damage occurs in areas that are environmentally sensitive or which provide critically important habitat for species which are listed under the Endangered Species Act (ESA) or are otherwise imperiled. Much of this damage occurs through feral swine's rooting behavior (digging for food with their snout) which disturbs both the structure and properties of soil. Rooting, in conjunction with trampling and compaction, leads to the leaching of important minerals, changes in decomposition rates and nutrient cycling as well as increased rates of erosion (Campbell and Long 2009). Feral swine cause erosion, increased turbidity, increased sedimentation, fecal contamination, nutrient mobilization, and surface water enrichment. As a result, they can have direct and indirect effects on aquatic biota and communities (Zengel and Conner 2008). Additionally, feral swine cause direct mortality through predation on native wildlife species. Feral swine are known to feed on many smaller animals (some threatened or endangered), and will consume voles, shrews, turtles, amphibians, and shrub or ground nesting birds (Campbell and Long 2009). Feral swine have also been known to consume snakes and fawns as well (Michael Clark, NYSDEC, personal communication 2017). In New York, feral swine have been documented rooting out and consuming the eggs of New York State threatened Blanding's turtle (D. Morgan, WS-NY, personal communication, 2010).

Need for Mammal Damage Management to Protect Property

Mammals cause damage to a variety of property types each year. From FY 2012 through FY 2016, WS-NY received reports of damages or threats of damage caused by mammals to aircraft, airport runways and taxiways, roads and bridges, railroads and trestles, residential and non-residential buildings, swimming pools, landfills, machinery, equipment, trees, shrubs, flowers, and turf. The most frequently reported damage type is the threat of aircraft striking mammals. The direct threat of aircraft strikes with mammals can cause substantial damage requiring costly repairs and aircraft downtime. Indirect threats to aircraft may result from large populations of small mammals such as rabbits, mice, and voles attracting larger mammalian and avian predators to the airfield and increasing the risk of a wildlife strike.

Burrowing activities of woodchuck, muskrat, and beaver can severely damage levees, dikes, earthen dams, landfills, and other structures (FEMA 2005). Woodchucks burrow under roadbeds and embankments and could potentially weaken or cause the collapse of these structures. Woodchucks also cause damage by chewing underground utility cables, sometimes resulting in power outages. Additionally, woodchuck burrows may cause damage to property when tractors and other equipment drop into a burrow or roll over due to a burrow. WS-NY has assisted NYCDEP with woodchuck management at a drinking water supply reservoir in Westchester County in the past, for example.

Beaver populations have increased substantially in the United States with the induction of a regulated trapping season as well as low pelt prices driving the trapping pressures down. The low trapping pressure has not only allowed populations to expand but it also has allowed for beaver damage losses to increase (Bhat et al. 1993). Dam-building by immigrating beavers has caused significant flooding damage around the country costing millions of dollars. In New York, beavers have caused significant damage in recent years. In 2012 a storm event in St. Lawrence County resulted in 4-5 inches of rain breeching several beaver dams upstream causing enough water to overflow an eight foot diameter culvert and flood a road. Most of the road was eroded away and it took approximately 500 tons of stone to replace the shoulder (A. Willard, St. Lawrence Highway Dept., personal communication, 2017). In addition, in Central Square New York, beavers blocked water flow through a culvert on CSX railroad property resulting in the track shoulders to be washed out and a train to derail. The devastation of this incident caused many consumers to have delays on receiving their products, an increased risk for potential biohazards from tipped train cars, and many road closures within the vicinity. This issue took three days of intensive around-the-clock labor to fix and involved SCUBA divers, excavators, backhoes, and approximately 20 men. The flooding took over 12 hours to drain and tens of thousands of dollars to fix in labor costs alone (J. Perez, CSX Transportation, personal communication, 2017).

Bears can present problems anywhere, and have been observed throughout much of New York. Bear complaints are often associated with increased human development, recreational activity, and agricultural expansion. These complaints generally include issues with bears feeding on garbage (at residences, restaurants, and campgrounds), apiaries (beehives), property damage, and general nuisance. The number one bear complaint in New York to the NYSDEC is presence of bears at bird feeders.

Rooting by feral swine can cause damage to roadbeds, dikes and other earthen structures. Feral swine have broken through livestock and game fences to consume animal feed and mineral supplements. In some areas, foraging swine have damaged landscaping, golf courses, and other ornamental plantings.

Coyotes are opportunistic feeders and have become more accustomed to people and our behaviors, particularly in the urban environment. When harassment of coyotes does not occur, coyotes will lose their wariness of humans and associate us with a safe, resource-rich environment (Timm et al. 2004). The last decade has shown drastic increases in human/coyote conflicts, including coyote attacks to pets.

Need for Non-Damage Related Activities by WS Involving Mammals

Not all WS' activities related to mammals may involve traditional damage management or threats to human health and safety. WS may be requested to assist with or conduct research and monitoring activities such as live-capturing mammals for marking or telemetry research or collecting road killed specimens to determine species distribution. WS' personnel may be involved in species population enhancement activities, such as live capturing mammals for reintroduction to historical habitat or habitat improvement. WS may also be requested to conduct or assist in rescuing and translocating mammals in dangerous situations or to euthanize severely injured or sick mammals that do not involve damage or threats to human health and safety.

1.3 NATIONAL ENVIRONMENTAL POLICY ACT (NEPA) AND WS DECISION-MAKING

All federal actions are subject to the NEPA (Public Law 9-190, 42 USC 4321 et seq.). WS follows CEQ regulations implementing the NEPA (40 CFR 1500 et seq.). In addition, WS follows the USDA (7 CFR 1b), and APHIS Implementing Guidelines (7 CFR 372) as part of the decision-making process. Those 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 the CEQ through regulations in 40 CFR 1500-1508. In accordance with the CEQ and USDA regulations, APHIS guidelines concerning the implementation of the NEPA, as published in the Federal Register (44 CFR 50381-50384) provide guidance to WS regarding the NEPA process.

Pursuant to the NEPA and the CEQ regulations, this EA documents the analyses of potential federal actions, informs decision-makers and the public of reasonable alternatives capable of avoiding or minimizing significant effects, 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 alternatives. The direct, indirect, and cumulative impacts of the proposed action are analyzed.

1.4 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. As the authority for the management of mammal populations in the state, the New York State Department of Environmental Conservation (NYSDEC) was involved in reviewing the EA and providing input throughout the EA preparation process to ensure an interdisciplinary approach according to the NEPA and agency mandates, policies, and regulations. The NYSDEC is responsible for managing wildlife in the state, including those mammalian species addressed in this EA (with the exception to feral/free-ranging cats and American bison), and establishes and enforces regulated hunting and trapping seasons. WS' activities to reduce and/or prevent mammal damage under the alternatives would be coordinated with the NYSDEC which would ensure WS' actions are incorporated into population objectives established for mammal species.

Based on the scope of this EA, the decisions to be made are:

- How can WS-NY best respond to the need to reduce mammal damage?
- Do the alternatives have significant impacts meriting an EIS?

1.5 AFFECTED ENVIRONMENT

Mammals can be found across New York throughout the year. Therefore, damage or threats of damage associated with mammals could occur wherever mammals occur as would requests for assistance to manage damage or threats of damage. Assistance would only be provided by WS when requested by a landowner or manager and WS would only provide direct operational assistance on properties where a MOU, Cooperative Service Agreement (CSA), or other comparable document had been signed between WS and the cooperating entity.

Upon receiving a request for assistance, the proposed action alternative, or those actions described in the other alternatives could be conducted on private, federal, state, tribal, and municipal lands in New York to reduce damage and threats associated with mammals. The analyses in this EA are intended to apply to actions taken under the selected alternative that could occur in any locale and at any time within the analysis area. This EA analyzes the potential impacts of mammal damage management and addresses activities that are currently being conducted under a MOU, CSA, or other comparable document with WS. This EA also addresses the potential impacts of MDM in New York where additional agreements may be signed in the future.

Federal, State, County, City, and Private Lands

Under two of the alternatives, WS could continue to provide MDM activities 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. In those cases where a federal agency requests WS' assistance with managing damage caused by mammals, 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.

Native American Lands and Tribes

The WS-NY program would only conduct damage management activities on Native American lands when requested by a Native American Tribe. Activities would only be conducted after a MOU or CSA 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 mammals on federal, state, county, municipal, and private properties under the alternatives analyzed in this EA would be available for use to 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.

Site Specificity

This EA analyzes the potential impacts of MDM based on previous activities conducted on private and public lands where WS and the appropriate entities have entered into a MOU, CSA, or other comparable document. The EA also addresses the impacts of MDM on 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 are to provide services when requested, within the constraints of available funding and workforce, it is conceivable that additional MDM efforts could occur. Thus, this EA anticipates the potential expansion and analyzes the impacts of such efforts as part of the alternatives.

Most of the mammal species addressed in this EA can be found statewide and throughout the year, therefore, damage or threats of damage can occur wherever those mammals occur. Planning for the management of mammal 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 could 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 of the sites where mammal damage could occur can be predicted, all specific locations or times where such damage would occur in any given year cannot be predicted. The threshold triggering an entity to request assistance from WS to manage damage associated with mammals 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 mammal damage and the resulting management actions could occur and are treated as such.

Chapter 2 of this EA identifies and discusses issues relating to MDM. 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 2 for a description of the Decision Model and its application). Decisions made using the model would be in accordance with WS' Directives 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.

1.6 AGENCIES INVOVLED IN THIS ENVIRONMENTAL ASSESSMENT AND THEIR ROLES AND 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 Authority

The primary statutory authority for the WS program is the Act of March 2, 1931 (46 Stat. 1468; 7 U.S.C. 8351-8352) as amended, and the Act of December 22, 1987 (101 Stat. 1329-331, 7 U.S.C. 8353). The WS program is the lead federal authority in managing damage to agricultural resources, natural resources, property, and threats to human health and safety associated with wildlife. WS' Directives define program objectives and guide WS' activities in managing wildlife damage.

NYS Department of Environmental Conservation (NYSDEC)

The 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).

NYS Department of Agriculture and Markets (NYSDAM)

The 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.

New York State Office of Parks, Recreation and Historic Preservation (OPRHP)

The OPRHP is a state agency charged with the operation of over 250 facilities including state parks, historic sites, boat launches, parkways and trails within New York. Their mission is to "provide safe and enjoyable recreational and interpretive opportunities for all New York State residents and visitors, and to be responsible stewards of valuable natural, historic, and cultural resources" (OPRHP 2010). As of 2013, the OPRHP manages nearly 335,000 acres (136,000 ha) of public lands and facilities that are visited by almost 70 million visitors each year. Among OPRHP's properties is Niagara Falls State Park, the first state park established in the United States.

New York City Department of Parks and Recreation

The New York City Department of Parks and Recreation is the steward of nearly 30,000 acres of land which amounts to about 14 percent of New York City, and includes more than 5,000 individual properties. The NYC Department of Parks and Recreation operates more than 800 athletic fields and nearly 1,000 playgrounds, 1,800 basketball courts, 550 tennis courts, 67 public pools, 51 recreational facilities, 15 nature centers, 14 golf courses, and 14 miles of beaches, and cares for 1,200 monuments and 23 historic house museums. The NYC Department of Parks and Recreation looks after 600,000 street trees, and two million more in parks.

Their vision is to create and sustain thriving parks and public spaces for New Yorkers, and their mission is to plan resilient and sustainable parks, public spaces, and recreational amenities, build a park system for present and future generations, and care for parks and public spaces.

New York City Department of Environmental Protection (NYCDEP)

The NYCDEP is a municipal agency of nearly 6,000 employees that manages and conserves New York City's water supply; distributes more than one billion gallons of clean drinking water each day to nine million New Yorkers and collects wastewater through a vast underground network of pipes, regulators, and pumping stations; and treats the 1.3 billion gallons of wastewater that New Yorkers produce each day in a way that protects the quality of New York Harbor. To achieve these mandates, DEP oversees one of the largest capital construction programs in the region. The source of NYC's drinking water comes from a network of 19 reservoirs and 3 controlled lakes in a 1,972 square-mile watershed. As the agency responsible for NYC's environment, DEP also regulates air quality, hazardous waste, and critical quality of life issues, including noise.

Port Authority of New York and New Jersey (PANYNJ)

The PANYNJ administers JFK International Airport pursuant to Federal Aviation Administration (FAA) guidelines that include Federal Aviation Regulation 14 CFR Part 139.337 ("Wildlife Hazard Management"). Part 139 mandates that airport authorities assess wildlife hazards at their airports and develop and conduct plans to reduce or eliminate these hazards in the interest of human safety. Since the 1960s, the PANYNJ has evaluated and conducted management plans to reduce hazards from wildlife, and it created the Bird Hazard Task Force (now Wildlife Hazard Task Force) in 1985 to monitor, improve, and guide PANYNJ actions regarding the wildlife hazards at JFK.

New York State Department of Health (NYSDOH)

The NYSDOH is responsible for the protection, improvement, and promotion of health and well-being for all New Yorkers.

United States Environmental Protection Agency (EPA)

The EPA is responsible for implementing and enforcing the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), which regulates the registration and use of pesticides, including repellents and pesticides available for use to manage damage associated with mammals. The EPA is also responsible for administering and enforcing Section 404 of the Clean Water Act (CWA) along with the U.S. Army Corps of Engineers.

United States Fish and Wildlife Service (USFWS)

The USFWS is the primary federal agency responsible for conserving, protecting, and enhancing the nation's fish and wildlife resources and their habitat. The USFWS has specific responsibilities for the protection of migratory birds, threatened and endangered species, inter-jurisdictional fish, and certain marine mammals, as well as for lands and waters managed by the agency in the National Wildlife Refuge System. The USFWS has statutory authority for enforcing the Fish and Wildlife Improvement Act of 1978 (16 USC 7.12), the Fish and Wildlife Act of 1956 (16 USC 742 a-j), and the Migratory Bird Treaty Act (16 USC 703-711).

Federal Aviation Administration (FAA)

The FAA is responsible for providing the safest and most efficient aerospace system in the world. The FAA regulates all aspects of civil aviation, including the construction and operation of airports, management of air traffic, and the certification of aircraft and personnel.

National Park Service (NPS)

The NPS is the federal agency responsible for managing all national parks in the United States, many American national monuments, and other conservation and historical properties. The NPS' role is to preserve the ecological and historical integrity of the places entrusted to its management while making them available to the public.

United States Food and Drug Administration (FDA):

The FDA is responsible for protecting the public health by assuring the safety, efficacy, and security of human and veterinary drugs, biological products, medical devices, our nation's food supply, cosmetics, and products that emit radiation. The FDA is also responsible for advancing the public health by helping to speed innovations that make medicines and foods more effective, safer, and more affordable; and helping the public get the accurate, science-based information they need to use medicines and foods to improve their health.

United States Drug Enforcement Administration (DEA):

The DEA is responsible for enforcing the Controlled Substance Act (1970). The DEA prevents the abuse and illegal use of controlled substances by regulating their production, distribution and storage.

United States Army Corps of Engineers (USACE):

The USACE is responsible for regulating all waters of the U.S. under the Clean Water Act (CWA).

1.7 RELATIONSHIP OF THIS EA TO OTHER ENVIRONMENTAL DOCUMENTS

Environmental Assessment - 2015 White-tailed Deer Damage Management in New York: WS-NY completed an EA that covered white-tailed deer damage management in the State of New York in 2015 (USDA 2015*a*). Management of damage and conflicts with white-tailed deer will not be addressed in this EA.

Environmental Assessment - 2013 Feral Swine Damage Management in New York: WS-NY completed an EA that covered feral swine damage management in the State of New York in 2013 (USDA 2013). That EA addressed the issues associated with managing feral swine damage in New York and analyzed alternative approaches to meet the specific needs identified in the EA while addressing the identified issues. Since the activities conducted under the previous EA will be re-evaluated under this EA to address the updated need for action and the associated affected environment, the previous EA will be superseded by this analysis and the outcome of the decision issued based on the analyses in this EA.

Environmental Impact Statement - 1994 Gull Hazard Reduction Program: John F. Kennedy International Airport [JFK]: APHIS-WS and cooperating agencies prepared an EIS that addressed bird collisions with aircraft at JFK. This EIS provided information on the nature of bird strikes with aircraft, alternatives for reducing bird strikes, and evaluated the environmental consequences of each alternative.

Environmental Impact Statement - Feral Swine Damage Management: A National Approach: APHIS-WS and cooperating agencies previously prepared an EIS that addressed feral swine damage management in the United States, American Samoa, Mariana Islands, United States Virgin Islands, Guam, and Puerto Rico (USDA 2015*b*). The Record of Decision selected the preferred alternative in the EIS to implement a nationally coordinated program that integrates methods to address feral swine damage. In accordance with the Record of Decision, WS developed this EA to be consistent with the EIS and the Record of Decision.

Environmental Assessment - 2009 Oral Vaccination to Control Rabies Virus Variants: WS completed an EA concerning the Oral Rabies Vaccination (ORV) program in 28 states and the District of Columbia in 2009. This EA addressed the issues and associated alternatives to manage and contain the spread of the rabies virus. In depth analysis of the rabies virus or associated issues pertaining to the virus will not be addressed in this EA.

Environmental Assessment - Proposal to Permit Take as provided under the Bald and Golden Eagle Protection Act: Developed by the USFWS, this EA evaluated the issues and alternatives associated with the promulgation of new regulations to authorize the "take" of bald eagles and golden eagles as defined under the Bald and Golden Eagle Protection Act. The preferred alternative in the EA evaluated the authorization of disturbance take of eagles, the removal of eagle nests where necessary to reduce threats to human safety, and the issuance of permits authorizing the lethal take of eagles in limited circumstances, including authorizing take that is associated with, but is not the purpose of, an action (USFWS 2009). A Decision and Finding of No Significant Impact (FONSI) was made for the preferred alternative in the EA. The selected alternative in the EA established new permit regulations for the "take" of eagles (see 50 CFR 22.26) and a provision to authorize the removal of eagle nests (see 50 CFR 22.27). The USFWS published a Final Rule on September 11, 2009 (74 FR 46836-46879).

1.8 SUMMARY OF PUBLIC INVOLVEMENT

Issues related to mammal damage management were initially developed by WS and stakeholder feedback/consultations. Issues were defined and preliminary alternatives were identified through the scoping process. As part of this process, and as required by the CEQ and APHIS' NEPA implementing

regulations, this document was made available to the public through legal notices published in local print media, through direct mailings to parties that have requested to be notified or have been identified to have an interest in the reduction of threats and damage associated with mammals, and by posting the EA on the APHIS website at: http://www.aphis.usda.gov/wildlifedamage/nepa.

WS provides 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 clearly communicated 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 were 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.

1.9 RATIONALE FOR PREPARING AN EA RATHER THAN AN EIS

WS has the discretion to determine the geographic scope of their analyses under the NEPA. The intent in developing this EA is to determine if the proposed action would potentially have significant individual and/or cumulative impacts on the quality of the human environment that would warrant the preparation of an EIS or a FONSI. In terms of considering cumulative effects, one EA analyzing impacts for the entire state will provide a more comprehensive and less redundant analysis than multiple EAs covering smaller areas. As most mammals are regulated by the NYSDEC, the best available data for analysis is often based on statewide population dynamics. For example, an EA on the county level may not have sufficient data for that area and would have to rely on statewide analysis anyway. If a determination is 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.

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 its 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 could 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 non-native invasive species are not protected under state or federal law. Most resident wildlife species are managed under state authority or law without any federal oversight or protection. Federal protection is provided for species through the ESA. In New York, with the possible exception of restrictions on methods (*e.g.*, firearms restrictions, pesticide regulations), unprotected wildlife species and certain resident wildlife species are managed with little or no restrictions allowing them to be killed or taken by anyone at any time when they are committing damage. For mammal damage management, the NYSDEC has the authority to manage and authorize the taking of mammals for damage management purposes, with the exception of species protected under the ESA.

When a non-federal entity (*e.g.*, agricultural producers, municipalities, counties, private companies, individuals, or any other non-federal entity) takes a mammal damage management action, the action is not subject to compliance with the NEPA due to the lack of federal involvement in the action. Under such circumstances, the environmental baseline or status quo must be viewed as an environment that includes those resources as they are managed or impacted by non-federal entities in the absence of the federal action being proposed. Therefore, in those situations in which a non-federal entity has decided that a management action directed towards mammals should occur and even the particular methods that would

be used, WS' involvement in the action would not affect the environmental status quo. Given that non-federal entities can receive authorization to use lethal MDM methods from the NYSDEC (depending on the species state classification), and since most methods for resolving damage are available to both WS and to non-federal entities, WS' decision-making ability is restricted to one of three alternatives: 1) WS can either take the action using the specific methods discussed in this EA upon request; 2) WS can provide non-lethal technical assistance only; 3) or WS can take no action, at which point the non-federal entity could take action anyway using the same methods during the hunting or trapping 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 because the action would likely occur in the absence of WS' direct involvement.

1.10 COMPLIANCE WITH LAWS AND STATUTES

Several laws and regulations pertaining to wildlife damage management activities, including activities that could be conducted in the state are discussed below. Those laws and regulations relevant to mammal damage management activities are addressed below. In addition, WS will comply with all local laws and ordinances when assistance is requested.

New York State Agriculture and Markets Law

Administered by the NYSDAM, these laws allow the NYSDAM to execute and carry into effect the laws of the state and the rules of the department relative to agriculture; horticulture; farm; fruit and dairy products; aquaculture; and the production, processing, transportation, storage, marketing and distribution of food.

Soil and Water Conservation Law

The Soil and Water Conservation Law allows for the preservation of soils and water resources in New York. Under this jurisdiction it calls for the improvement of water quality, for the control and prevention of soil erosion, and for the prevention of floodwater and sediment damage. It also outlines furthering the conservation, development, utilization and disposal of water, and seeks to preserve natural resources, control and abate non-point sources of water pollution, assist in the control of floods, assist in drainage and irrigation or agricultural lands, prevent impairment of dams and reservoirs, assist in maintaining navigability of rivers, preserve wildlife, protect the tax base, protect public lands, and protect and promote the health, safety and general welfare of the people of New York State.

New York State Environmental Conservation Law

New York State Environmental Conservation Law is the body of law that established the NYSDEC and authorizes its programs. The NYSDEC is responsible for administration and enforcement of the Environmental Conservation Law, including the administration of fish and wildlife laws as well as all matters relating to the use of pesticides, and is responsible for carrying out sound fish and wildlife management practices. The NYSDEC accomplishes this by drafting, promulgating, and enforcing environmental regulations. Under the New York Administrative Code "...U.S. government agencies' employees whose responsibility includes fisheries and wildlife management...will be deemed to be permitted...to capture, temporarily hold or possess, transport, release, and when necessary humanely euthanize wildlife, provided that the methods of and documentation for the capture, possession, transport, release and euthanasia shall be in accordance with board policy."

Bald and Golden Eagle Protection Act (16 USC 668-668c), as amended

Populations of bald eagles showed periods of steep declines in the lower United States during the early 1900s attributed to the loss of nesting habitat, hunting, poisoning, and pesticide contamination. To curtail declining trends in bald eagles, Congress passed the Bald Eagle Protection Act (16 USC 668) in 1940 prohibiting the take or possession of bald eagles or their parts. The Bald Eagle Protection Act was amended in 1962 to include the golden eagle and is now referred to as the Bald and Golden Eagle Protection Act. Certain populations of bald eagles were listed as "endangered" under the Endangered Species Preservation Act of 1966, which was extended when the modern ESA was passed in 1973. The "endangered" status was extended to all populations of bald eagles in the lower 48 states, except populations of bald eagles in Minnesota, Wisconsin, Michigan, Washington, and Oregon, which were listed as "threatened" in 1978. As recovery goals for bald eagle populations began to be reached in 1995, all populations of eagles in the lower 48 States were reclassified as "threatened". In 1999, the recovery goals for populations of eagles had been reached or exceeded and the eagle was proposed for removal from the ESA. The bald eagle was officially de-listed from the ESA on June 28, 2007 with the exception of the Sonora Desert bald eagle population. Although officially removed from the protection of the ESA across most of its range, the bald eagle is still afforded protection under the Bald and Golden Eagle Protection Act.

Under the Bald and Golden Eagle Protection Act (16 USC 668-668c), the take of eagles is prohibited without a permit from the USFWS. Under the Act, the definition of "take" includes actions that "*pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, destroy, molest, or disturb*" eagles. The regulations authorize the USFWS to issue permits for the take of bald eagles and golden eagles on a limited basis (see 74 FR 46836-46837, 50 CFR 22.26, 50 CFR 22.27). As necessary, WS would apply for the appropriate permits as required by the Bald and Golden Eagle Protection Act.

Additional information regarding the natural history, status, and current threats to New York State's bald eagle population can be found in the "Conservation Plan for Bald Eagles in New York State": http://www.dec.ny.gov/docs/wildlife_pdf/nybaldeagleplan.pdf.

Endangered Species Act (ESA)

The ESA recognizes that our natural heritage is of *"esthetic, ecological, educational, recreational, and scientific value to our Nation and its people*." The purpose of the Act is to protect and recover species that are in danger of becoming extinct. Under the ESA, species may be listed as endangered or threatened. Endangered is defined as a species that is in danger of becoming extinct throughout all or a significant portion of its range while threatened is defined as a species likely to become endangered in the foreseeable future. Under the ESA, *"all federal departments and agencies shall seek to conserve endangered and threatened species and shall utilize their authorities in furtherance of the purposes of the Act"* (Sec.2(c)). Additionally, the Act requires that, *"each Federal agency shall in consultation with and with the assistance of the Secretary, insure 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 or result in the destruction or adverse modification of habitat of such species……each agency will use the best scientific and commercial data available"* (Sec.7 (a) (2)). WS consults with the USFWS to ensure that the agency's actions, including the actions proposed in this EA, are not likely to jeopardize the existence of endangered or threatened species or their habitat.

National Historic Preservation Act (NHPA) 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 MDM methods described in this EA that might be used operationally by WS causes 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 could result in effects on the character or use of historic properties. Therefore, the methods that would be used by WS under the alternatives are not generally the types of activities that would have the potential to affect historic properties. If an individual activity with the potential to affect historic resources is planned under an alternative selected as a result 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 hazing or 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 factor for this issue is that virtually all the methods involved would only have temporary effects on the audible nature of a site and can 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.

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 established under the Coastal Zone Management Act.

Environmental Justice in Minority and Low Income Populations (Executive Order 12898)

Executive Order 12898, promotes the fair treatment of people of all races, income levels and cultures with respect to the development, implementation and enforcement of environmental laws, regulations and policies. Environmental justice is the pursuit of equal justice and 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. All activities are evaluated for their impact on the human environment and compliance with Executive Order 12898.

WS would use only legal, effective, and environmentally safe wildlife damage management methods, tools and approaches. All chemicals that could be used by WS are regulated by the EPA through the FIFRA, by the NYSDEC Division of Materials Management, by the DEA, by MOUs with land managing agencies, and by WS' Directives. WS would properly dispose of any excess solid or hazardous waste. It is not anticipated that the proposed action or the alternatives would result in any adverse or disproportionate environmental impacts to minority and low-income persons or populations. In contrast, the alternatives may benefit minority or low-income populations by reducing threats to public health and safety and property damage.

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. WS makes it a high priority to identify and assess environmental health and safety risks that may disproportionately affect children. WS 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 would be 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 the proposed action or the alternatives. Additionally, since the proposed mammal damage management program is directed at reducing human health and safety risks at locations where children are sometimes present, it is expected that health and safety risks to children posed by mammals would be reduced.

Invasive Species (Executive Order 13112)

Executive Order 13112 directs federal agencies to use their programs and authorities to prevent the spread or to control populations of invasive species that cause economic or environmental harm or harm to human health and safety. 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.

The Native American Graves and Repatriation Act of 1990

The Native American Graves Protection and Repatriation Act requires 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 has been made to protect the items and the proper authority has been notified.

Airborne Hunting Act

The Airborne Hunting Act, passed in 1971 (Public Law 92-159), and amended in 1972 (Public Law 92-502) added to the Fish and Wildlife Act of 1956 as a new section (16 USC 742j-l) that prohibits shooting or attempting to shoot, harassing, capturing or killing any bird, fish, or other animal from aircraft except

for certain specified reasons. Under exception [16 USC 742j-l, (b)(1)], state and federal agencies are allowed to protect or aid in the protection of land, water, wildlife, livestock, domesticated animals, human life, or crops using aircraft.

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 mammals that may cause safety and health concerns at workplaces.

Federal Insecticide, Fungicide, and Rodenticide Act

The FIFRA and its implementing regulations (Public Law 110-426) requires the registration, classification, and regulation of all pesticides used in the United States. The EPA is responsible for implementing and enforcing FIFRA. All chemical methods integrated into the WS program in New York are registered with and regulated by the EPA and the NYSDEC Bureau of Pesticides, and would be used by WS in compliance with labeling procedures and requirements.

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.

Controlled Substances Act of 1970 (21 U.S.C. 821 et seq.)

This law requires an individual or agency to have a special registration number from the 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 could 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 of time 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. WS would establish procedures for administering drugs used in wildlife capture and handling that would be approved by state veterinary authorities in order to comply with this law.

Clean Water Act (Section 404)

Section 404 (33 U.S.C. 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, 33 CFR 330).

Food Security Act

The Wetland Conservation provision (Swampbuster) of 1985 (16 USC 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 as a result 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. The Natural Resource Conservation Service is responsible for certifying wetland determinations according to this Act.

CHAPTER 2: DEVELOPMENT OF ALTERNATIVES

Chapter 2 contains a discussion of the issues that have driven the development of standard operating procedures and alternatives to address mammal damage. This chapter also contains a description of the Integrated Wildlife Damage Management (IWDM) strategies that are typically used to manage wildlife damage, including a description of WS' operational, technical, and research assistance and the decision model used to resolve wildlife complaints. The issues, management strategies, and SOPs collectively formulated the alternatives. Chapter 2 also discusses alternatives considered but not analyzed in detail, with rationale.

2.1 ISSUES ADDRESSED IN THE ANALYSIS OF THE ALTERNATIVES

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 and other issues associated with mammals in New York were developed by WS through discussions with partnering agencies, cooperators, and stakeholders.

The issues as they relate to the possible implementation of the alternatives, including the proposed action, are discussed in detail in Chapter 3. The issues analyzed in detail are the following:

Issue 1 - Effects of Damage Management Activities on Populations of Target Mammals

A common issue when addressing damage caused by wildlife are the potential impacts of management actions on the populations of target species. Methods used to resolve damage or threats to human safety can involve altering the behavior of target species and may require the use of lethal methods when appropriate. Non-lethal methods can disperse or otherwise make an area unattractive to target species causing damage which reduces the presence of those species at the site and potentially the immediate area around the site where non-lethal methods are employed. Although non-lethal methods do not physically harm wildlife, harassment of threatened and endangered species is considered "take" under the ESA. Lethal methods would be employed to remove a mammal or those mammals 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 target species 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 populations from the use of lethal methods would be based on a measure of the number of animals killed in relation to their abundance and/or legal status. Magnitude may be determined either quantitatively or qualitatively. Quantitative determinations are based on population estimates, allowable harvest levels, and actual harvest data. Qualitative determinations are based on population trends and harvest data when available. Generally, WS only conducts damage management on species whose population densities are high and usually only after they have caused damage. WS' removal is monitored by comparing numbers of animals killed with overall populations or trends in populations in the state to assure the magnitude of take is maintained below the level that would cause adverse impacts to the viability of native species populations. All lethal removal of mammals by WS would occur at the requests of a cooperator seeking assistance and only after authorization has been provided by the NYSDEC for the lethal take, when required.

In addition, many of the mammal species addressed in this EA can be harvested during annual hunting and/or trapping seasons and can be addressed using available methods by other entities when those species cause damage or pose threats of damage when permitted by the NYSDEC. Therefore, any mammal damage management activities conducted by WS under the alternatives addressed would be occurring along with other natural process and human-induced events such as natural mortality, human-induced mortality from private damage management activities, mortality from regulated harvest, and human-induced alterations of wildlife habitat.

Issue 2 - Effects of Damage Management on Non-target 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. 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 and threats associated with mammals are further discussed in Appendix B.

The ESA is a federal legislation that makes it illegal for any person to '*take*' any listed endangered or threatened species or their critical habitat except through permit. The ESA defines take as, "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct" (16 USC 1531-1544). Critical habitat is a specific geographic area or areas that are essential for the conservation of a threatened or endangered species. The ESA requires that federal agencies conduct their activities in a way to conserve species. It also requires that federal agencies consult with the USFWS prior to undertaking any action that may take listed endangered or threatened species or their critical habitat pursuant to Section 7(a)(2) of the ESA.

At the state level, the NYSDEC's Endangered Species Program protects animal species listed as threatened or endangered in New York (see Appendix D). This list includes all species listed under the ESA that occur in New York, as well as other species that were once more prevalent in New York. The NYSDEC issues limited permits for harassment and incidental take of listed species for the purposes of research and protection of property, human safety, and agriculture.

There may also be concerns that WS' activities could result in the disturbance of eagles that may be near or within the vicinity of WS' activities. Under 50 CFR 22.3, the term "disturb", as it relates to take under the Bald and Golden Eagle Act, has been defined as "to agitate or bother bald and golden eagles to a degree that causes, or is likely to cause, based on the best scientific information available, 1) injury to an eagle, 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or

sheltering behavior, or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior." The environmental consequences evaluation conducted in Chapter 3 of this EA will discusses the potential for WS' activities to disturb eagles as defined by the Act.

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

An additional issue often raised is the potential risk 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 health and safety. WS' employees use and recommend only those methods which are legally available, selective for target species, and are effective at resolving the damage associated with wildlife. Still, some concerns exist regarding the safety of WS' methods despite their legality. As a result, WS will analyze the potential for proposed methods that pose a risk to members of the public or employees of WS. WS' employees are potentially exposed to damage management methods as well as subject to workplace accidents. Selection of methods, as part of an integrated approach, includes 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, or from wildlife that have been exposed. Under the alternatives identified, the use of chemical methods would include immobilizing drugs, euthanasia drugs, reproductive inhibitors, fumigants, toxicants, and repellents. These methods are further discussed in Appendix B.

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. This issue is expected to only be of concern for wildlife which are hunted and sometimes consumed by people as food. All harvestable wildlife that has been exposed to drugs by WS will be properly marked with instruction to "do not eat." Chemicals proposed for use under the relevant alternatives are regulated by the EPA through FIFRA, by state laws, by the DEA, by the FDA, and by WS' Directives.

Safety of Non-Chemical Methods Employed

Non-chemical methods employed to reduce damage and threats to safety caused by mammals, if misused, could potentially be hazardous to human safety. Non-chemical methods may include but are not limited to firearms, live-traps, exclusion, body-gripping traps, pyrotechnics, and other scaring devices. A complete list of non-chemical methods available to alleviate damage associated with mammals is provided in Appendix B of this EA. The cooperator requesting assistance would be made aware through a MOU, CSA, or a similar document that those devices agreed upon could potentially be used on property owned or managed by the cooperator; thereby, making the cooperator aware of the use of those methods on property they own or manage to identify any risks to human safety associated with the use of those methods.

Issue 4 - Humaneness and Animal Welfare Concerns of Methods

Humaneness, in part, is a person's perception of harm or pain inflicted on an animal, and people may perceive the humaneness of an action differently. 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 could 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), suffering is described as a *"…highly unpleasant emotional response usually associated with pain and distress*" (AVMA 1987). 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 could 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, but assessing pain experienced by animals can be challenging (AVMA 2013, California Department of Fish and Game 1991). The AVMA defines pain as being, "*that sensation* (perception) *that results from nerve impulses reaching the cerebral cortex via ascending neural pathways*" (AVMA 2013). The key component of this definition is the perception of pain. The AVMA (2013) notes that "pain" should not be used for stimuli, receptors, reflexes, or pathways because these factors may be active without pain perception. For pain to be experienced, the cerebral cortex and subcortical structures must be functional. If the cerebral cortex is nonfunctional because of tissue destruction, hypoxia, depression by drugs, electric shock, or concussion, pain is not experienced.

Stress has been defined as the effect of physical, physiologic, or emotional factors (stressors) that induce an alteration in an animal's base or adaptive state. Responses to stimuli vary among animals based on the animals' experiences, age, species and current condition. Not all forms of stress result in adverse consequences for the animal and some forms of stress serve a positive, adaptive function for the animal. Eustress describes the response of animals to harmless stimuli which initiate responses that are beneficial to the animal. Neutral stress is the term for response to stimuli which have neither harmful nor beneficial effects to the animal. Distress results when an animal's response to stimuli interferes with its well-being and comfort (AVMA 2013).

Analysis of this issue must consider not only the welfare of the animals captured, but also the welfare of humans, pets, livestock, and T&E species if damage management methods are not used. For example, some individuals may perceive techniques used to remove a predator that is killing or injuring pets or livestock as inhumane, while others may believe it is equally or more inhumane to permit pets and livestock that depend upon humans for protection to be injured or killed by predators.

2.2 DAMAGE MANAGEMENT STRATEGIES AVAILABLE FOR ALTERNATIVES

Integrated Wildlife Damage Management (IWDM)

The most effective approach to resolving wildlife damage is to integrate the use of several methods simultaneously or sequentially. The philosophy behind IWDM is to implement the best combination of effective management methods in the most cost-effective manner while minimizing the potentially harmful effects on humans, target and non-target species, and the environment. IWDM may incorporate cultural practices (*e.g.*, animal husbandry), habitat modification (*e.g.*, exclusion), animal behavior modification (*e.g.*, scaring), removal of individual offending animals, local population reduction, elimination of invasive species (*e.g.*, feral swine) or any combination of these, depending on the circumstances of the specific damage problem.

The IWDM Strategies Employed by WS

Direct Damage Management Assistance

Direct damage management assistance includes damage management activities that are directly conducted or supervised by WS personnel. Direct damage management assistance may be initiated when the problem cannot effectively be resolved through technical assistance alone and when a *Work Initiation Document for Wildlife Damage Management* or other comparable instruments provide for direct damage management by WS. The initial investigation defines 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 are often required to effectively resolve problems, especially if restricted-use pesticides are necessary or if the problems are complex.

Technical Assistance Recommendations

Technical assistance as used herein is information, demonstrations, and advice on available and appropriate wildlife damage management methods and approaches. The implementation of damage management actions is the responsibility of the requester. In some cases, WS provides supplies or materials that are of limited availability for use by non-WS entities. Technical assistance may be provided through a personal or telephone consultation, or during an on-site visit with the requester. Generally, several management strategies are described to the requester for short and long-term solutions to damage problems. These strategies are based on the level of risk, need, and the practicality of their application. In some instances, wildlife-related information provided to the requestor by WS results in tolerance/acceptance of the situation. In other instances, management options are discussed and recommended.

Under APHIS' NEPA implementing regulations and specific guidance for the WS program, WS technical assistance is categorically excluded from the need to prepare an EA or EIS. However, it is discussed in this EA because it is an important component of the IWDM approach to resolving mammal damage problems.

Educational Efforts

Education is an important element of WS program 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 has no balance, but rather is in continual flux. WS routinely disseminates recommendations and information to individuals sustaining damage. Additionally, WS provides lectures, courses, and demonstrations to producers, homeowners, state and county agents, colleges and universities, and other interested groups related to wildlife damage management and disease issues. WS frequently cooperates with other agencies in education and public information efforts including cooperative presentations or publications. Technical papers are presented at professional meetings and conferences so that WS personnel, other wildlife professionals, and the public are 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 arm of WS by providing scientific information and development of methods for wildlife damage management that are effective and environmentally responsible. NWRC scientists work closely with wildlife managers, researchers, field specialists and others to develop and evaluate wildlife damage management techniques. NWRC scientists have authored hundreds of scientific publications and reports, and are respected world-wide for their expertise in wildlife damage management.

Wildlife Services Decision-Making

WS personnel use a thought process for evaluating and responding to damage complaints which is depicted by the WS Decision Model and described by Slate et al. (1992) (Figure 2.1). WS personnel are frequently contacted after requesters have tried or considered non-lethal methods and found them to be impractical, too costly, or inadequate to reduce damage. WS personnel assess the problem 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 are incorporated into a management strategy. After this strategy has been implemented, monitoring is conducted and evaluation continues to assess the effectiveness of the strategy. If the strategy is effective, the need for further management is ended. In terms of the WS Decision Model (Slate et al. 1992), most damage management efforts consist of continuous feedback between receiving the request and monitoring the results of the damage management strategy. The Decision Model is not a written documentation process, but a mental problem-solving process common to most, if not all, professions.

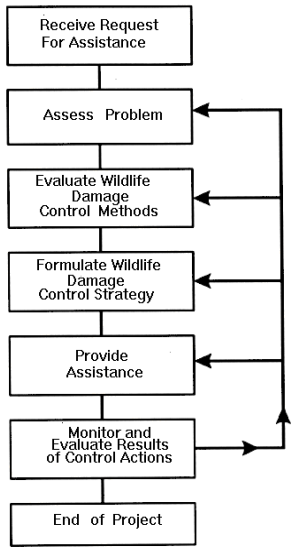

Figure 2.1 WS Decision Model as presented by Slate et al. (1992) for developing a strategy to respond to a request for assistance with human-wildlife conflicts.

Private Property Decision-makers

WS often receives requests for assistance from private property owners. In the case of private property owners, the decision-maker is the individual that owns or manages the affected property. The decision-maker has the discretion to involve others as to what occurs or does not occur on property they own or manage.

Public Property Decision-makers

The decision-maker for local, state, or federal property would be the official responsible for or authorized to manage the public land to meet interests, goals, and legal mandates for the property. WS could provide technical assistance to this person and provide recommendations to reduce damage. Direct Damage Management could be provided by WS if requested, when funding was provided, and the requested actions were within the recommendations made by WS.

Community-based Decision-making

The WS program follows the "co-managerial approach" to solve wildlife damage or conflicts as described by Decker and Chase (1997). Within this management model, WS could provide technical assistance regarding the biology and ecology of mammals and effective, practical, and reasonable methods available

to the local decision-maker(s) to reduce damage or threats. This could include non-lethal and lethal methods depending on the alternative selected. WS and other state, tribal and federal wildlife management agencies may facilitate discussions at local community meetings when resources are available.

Requests for assistance to manage damage caused by mammals often originate from the decision-maker(s) based on community feedback or from concerns about damage or threats to human health and safety. As representatives of the community, the decision-maker(s) are able to provide the information to local interests either through technical assistance provided by WS or through demonstrations and presentation by WS on MDM activities. This process allows decisions on MDM activities to be made based on local input. They may implement management recommendations provided by WS or others on their own, or may request management assistance from WS, other wildlife management agencies, local animal control agencies, or private businesses or organizations.

2.3 STANDARD OPERATING PROCEDURES FOR MAMMAL DAMAGE MANAGEMENT

SOPs improve the safety, selectivity, and efficacy of wildlife damage management activities. The WS program uses many such SOPs. Those SOPs would be incorporated into activities conducted by WS when addressing mammal damage and threats.

Some key SOPs pertinent to the proposed action and alternatives include the following:

- The WS Decision Model, which is designed to identify effective wildlife damage management strategies and their impacts, would be consistently used and applied when addressing mammal 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.

- All pesticides and repellants used would be registered and regulated by the NYSDEC.

- Immobilizing and euthanasia drugs would be used according to the DEA, FDA, and WS' Directives and procedures.

- All controlled substances would be registered with the DEA or the FDA.

- WS' employees would follow approved procedures outlined in the WS' Field Manual for the Operational Use of Immobilizing and Euthanizing Drugs (Johnson et al. 2001).

- WS' employees that use controlled substances would be trained to use each material and are certified to use controlled substances.

- WS' employees who use pesticides and controlled substances would participate in state-approved continuing education to keep current on developments and maintain their certifications.

- 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.

2.4 ADDITIONAL STANDARD OPERATING PROCEDURES SPECIFIC TO THE ISSUES

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

Issue 1 - Effects of Damage Management Activities on Target Mammal Populations

- Lethal take of mammals by WS would be reported and monitored by WS and the NYSDEC to help evaluate population trends and the magnitude of WS' take of mammals and ensure activities do not adversely affect mammal populations.

- The take of mammals under the alternatives would only occur under conditions permitted by the NYSDEC, USFWS, and local ordinances when applicable, and only at levels authorized.

- Management actions would be directed toward localized populations or groups of target species and/or an individual of those species. Generalized population suppression across major portions of New York would not be conducted with the exception of exotic and/or invasive species.

- The use of non-lethal methods would be considered prior to the use of lethal methods when managing mammal damage.

Issue 2 - Effects of Damage Management on Non-target Wildlife Species Populations, Including T&E Species

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

- Personnel would be present during the use of live-capture methods or live-traps would be checked at least every 24 hours to ensure non-target and T&E species are released immediately or are prevented from being captured.

- Carcasses of mammals retrieved after damage management activities have been conducted would be disposed of in accordance with WS Directive 2.515. In addition, select species, such as New England cottontail would be given to NYSDEC to facilitate research efforts.

- Non-target animals captured in traps would be released unless it is determined by WS that the animal would not survive and/or that the animal cannot be released safely. Non-targets captured on airports would be removed from premises regardless of condition to reduce the threat to airport property and human health and safety.

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

- As appropriate, damage management activities would be conducted away from areas of high human activity. If this is not possible, then activities would be conducted during periods when human activity is low (*e.g.*, early morning).

- Shooting would be conducted during time periods when public activity and access to the control areas are restricted. Personnel involved in shooting operations are trained and qualified in the proper and safe application of this method.

- Trapping would be conducted in areas of low human activity when appropriate and personnel involved in trapping activities will be fully trained in the proper and safe application of this method. As appropriate, WS would use signage and other means of notification to ensure the public is aware of trapping applications or applications sites.

- 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. WS' use of chemicals and training requirements to use those chemicals are outlined in WS Directive 2.401 and WS Directive 2.430.

- All chemical methods used by WS or recommended by WS would be registered with the EPA, DEA, FDA, and the NYSDEC Division of Materials Management, as appropriate.

- WS would adhere to all established withdrawal times for mammals when using immobilizing drugs for the capture of mammals that are agreed upon by WS, the NYSDEC, and veterinary authorities. Although unlikely, in the event that WS is requested to immobilize mammals either during a period of time when harvest of those mammal species is occurring or during a period of time where the withdrawal period could overlap with the start of a harvest season, WS would euthanize the animal or mark the animal with ear tags labeled with a "*do not eat*" warning and appropriate contact information.

- Pesticide and controlled substance use, storage, and disposal would conform to label instruction and other applicable laws and regulations, and Executive Order 12898.

Issue 4 - Humaneness and Animal Welfare Concerns of Methods

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

- WS' use of euthanasia methods would follow those recommended by WS' Directives (WS Directive 2.505, WS Directive 2.430) and AVMA guidelines (AVMA 2013).

- WS' use of all traps, cable restraints, and other capture devices would comply with WS Directive 2.450.

2.5 ALTERNATIVES

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 3 (Environmental Consequences). The following alternatives were developed to meet the need for action and address the identified issues associated with managing damage caused by mammals in New York.

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

The no action/proposed action alternative would continue the current implementation of an adaptive integrated approach utilizing non-lethal and lethal techniques, as deemed appropriate using the WS Decision Model, to reduce damage and threats caused by mammals. WS, in consultation with the NYSDEC, would continue to respond to requests for assistance with, at a minimum, technical assistance,

or when funding is available, operational damage management. Funding could occur through federal appropriations or from cooperative funding.

The adaptive approach to managing damage associated with mammals would integrate the use of the most practical and effective methods to resolve a request for damage management as determined by 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. WS would work with those persons experiencing mammal damage in addressing those mammals responsible for causing damage as expeditiously as possible. To be most effective, damage management activities should begin as soon as mammals begin to cause damage. Mammal damage that has been ongoing can be difficult to resolve using available methods since mammals could be conditioned to an area and are familiar with a particular location. Subsequently, making that area unattractive through the use of available methods can be difficult to achieve once damage has been 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.

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 could take to reduce damages caused by mammals, or 3) provide technical assistance and direct operational assistance to a property owner or manager experiencing damage. The removal of many of the mammal species native to New York or designated game species can only legally occur through regulated hunting and trapping seasons or through the issuance of a permit or license by the NYSDEC and only at levels specified in the permit. Activities conducted under this alternative would occur in compliance and in coordination with the NYSDEC, for example, having the proper permitting taken care of beforehand and only removing species at the specified levels.

Property owners or managers requesting assistance would be provided with information regarding the use of effective and practical non-lethal and lethal techniques under this alternative. 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 without consulting another private or governmental agency, or take no action.

Mammals could be euthanized by close range gunshot once live-captured, which is a method of euthanasia considered appropriate by the AVMA for free-ranging wildlife, when administered appropriately (AVMA 2013). On occasion, euthanasia of live-captured mammals would occur through the use of euthanasia drugs or carbon dioxide once the animal was captured using other methods. Euthanasia drugs are an acceptable form of euthanasia for free-ranging wildlife while carbon dioxide is a conditionally acceptable[5] method of euthanasia (AVMA 2013).

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 mammal damage would include limited habitat manipulations, exclusion and/or changes in cultural practices, which are addressed further below and in Appendix B.

[5]The AVMA (2013) defines conditional acceptable as "...[methods] *that by the nature of the technique or because of greater potential for operator error or safety hazards might not consistently produce humane death or are methods not well documented in the scientific literature".*

Non-lethal methods can disperse or otherwise make an area unattractive to mammals; thereby, reducing the presence of mammals at the site and potentially the immediate area around the site where non-lethal methods are employed. Non-lethal methods would be given priority when addressing requests for assistance (WS Directive 2.101) and include methods of exclusions, harassment, habitat modification, and live trap and translocation. 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 in resolving the damage or threats of damage. When effective, non-lethal methods would disperse mammals from the area resulting in a reduction in the presence of those mammals at the site. For any management methods employed, the proper timing is essential in effectively dispersing those mammals causing damage. Employing methods soon after damage begins or soon after threats are identified increases the likelihood that those damage management activities would achieve success in addressing damage. Therefore, coordination and timing of methods is necessary to be effective in achieving expedient resolution of mammal damage.

Lethal methods would be employed to resolve damage associated with those mammal species identified by WS as responsible for causing damage or threats to property, agricultural resources, natural resources, and human health and safety only after receiving a request for the use of those methods. The use of lethal methods may result in local population reductions in the area where damage or threats were occurring since mammals would be removed from the population. Lethal methods are often employed to reinforce non-lethal methods and to remove mammals that have been identified as causing damage or posing a threat to cause damage. The number of mammals 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 mammals involved with the associated damage or threat, whether negative impacts are sufficiently reduced to protect property or human health and safety, and the efficacy of methods employed.

WS may recommend mammals be harvested during the regulated hunting and/or trapping season for those species in an attempt to reduce the number of mammals causing damage. Managing mammal populations over broad areas could lead to a decrease in the number of mammals causing damage, however population management is not the goal of WS' technical assistance or direct operational assistance. Establishing hunting or trapping seasons and managing wildlife populations is the responsibility of the NYSDEC. WS' main responsibility focuses on animal damage management. Additionally, WS will comply with all permitting required to carry out the work involved.

Alternative 2 - Non-lethal Mammal Damage Management Only by WS

Under this alternative, WS would be restricted to only using or recommending non-lethal methods to resolve damage caused by mammals (Appendix B). These non-lethal methods include exclusions, habitat management, animal behavioral modifications (*e.g.* human effigies, harassment), and live capture and translocation. Lethal methods could continue to be used under this alternative by those persons experiencing damage from mammals without involvement by WS. In situations where non-lethal methods were impractical or ineffective to alleviate damage, WS could refer requests for information regarding lethal methods to the NYSDEC, local animal control agencies, or private businesses or organizations. Property owners or managers might choose to implement WS' non-lethal recommendations on their own or with the assistance of WS, implement lethal methods on their own, or request assistance (non-lethal or lethal) from a private or public entity other than WS.

Alternative 3 - No Mammal Damage Management Conducted by WS

This alternative would preclude any and 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 mammal damage management. All requests for assistance received by WS to resolve damage caused by mammals would be referred to the NYSDEC and/or other private entities.

Despite no involvement by WS in resolving damage and threats associated with mammals, those persons experiencing damage caused by mammals could continue to resolve damage by employing those methods legally available since the lethal removal of mammals to alleviate damage or threats can occur despite the lack of involvement by WS. The lethal removal of mammals could occur through the issuance of permits by the NYSDEC, when required, and during the hunting or trapping seasons for regulated game species. All methods described in Appendix B would be available for use by those persons experiencing damage or threats except for the use of immobilizing drugs and euthanasia chemicals. Immobilizing drugs and euthanasia chemicals can only be used by WS or appropriately licensed veterinarians.

2.6 ALTERNATIVES CONSIDERED BUT NOT ANALYZED IN DETAIL

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

All Non-lethal Methods Implemented Before Lethal Methods

This alternative would require that all non-lethal methods or techniques described in Appendix B be applied to all requests for assistance to reduce damage and threats to safety from mammals. If the use of all 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 those persons experiencing mammal damage but would only prevent the use of those methods by WS until all 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) is similar to a non-lethal before lethal alternative because the use of non-lethal methods is considered before lethal methods by WS (WS Directive 2.101). Adding a non-lethal before lethal alternative and the associated analysis would not add additional information to the analyses in the EA.

Use of Lethal Methods Only by WS

This alternative would require the use of lethal methods only to reduce threats and damage associated with mammals. 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 mammal damage. In those situations where damage could be alleviated using non-lethal methods deemed effective, those methods would be employed or recommended as determined by the WS Decision Model. Therefore, this alternative was not considered in detail.

Trap and Translocate Mammals Only

Under this alternative, all requests for assistance would be addressed using live-capture methods or the recommendation of live-capture methods. Mammals would be live-captured using immobilizing drugs, live-traps, or nets (*e.g.*, cannon nets, rocket nets, or drop nets). All mammals live-captured through direct operational assistance by WS would be translocated.

Translocation sites would be identified and have to be pre-approved by the NYSDEC and the property owner where the translocated mammals would be placed prior to live-capture and translocation. Live-capture and translocation could be conducted as part of the alternatives analyzed in detail. When requested by the NYSDEC, WS could translocate mammals or recommend translocation under any of the alternatives analyzed in detail, except under the no involvement by WS alternative (Alternative 3). Since WS does not have the authority to translocate mammals unless permitted by the NYSDEC, this alternative was not analyzed in detail. In addition, the translocation of mammals by WS could occur under any of the alternatives analyzed in detail, except Alternative 3. However, translocation by other entities could occur under Alternative 3.

The translocation of mammals that have caused damage to other areas following live-capture generally would not be effective or cost-effective (Beringer et al. 2002). Translocation is generally ineffective because problem mammal species 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 mammal damage problems at the new location. In a study in north-central Illinois, raccoons were trapped and relocated, then monitored (Mosillo et al. 1999). The study found that translocated raccoons left the release site very quickly (hours to days) and dispersed into the surrounding environment. Many of them denned near human residences after dispersal, potentially creating new conflicts with landowners. Also, hundreds of mammals would need to be captured and translocated to solve some damage problems; therefore, translocation would be unrealistic. Additionally, WS-NY radio-collared and tracked six raccoons in St. Lawrence County in 2001, to document their movements and to determine whether or not they would return to their original territories after translocation. Three raccoons were moved approximately two miles, and three raccoons were moved six miles from their home ranges. All raccoons returned to their original territories, although the three that were transported six miles took longer to do so (D. Morgan, WS-NY, personal communication, 2017).

Translocation of wildlife is also discouraged by WS policy (WS Directive 2.501) because of the stress to the translocated animal, poor survival rates, and the difficulties that translocated wildlife have with adapting to new locations or habitats (Nielsen 1988). There is also a concern of spreading wildlife diseases by moving wildlife from one location to another. Particularly in New York, species that are vectors of the rabies virus (bats, raccoons, and skunks) cannot be translocated outside of the county where the animal was obtained under the Wildlife Rehabilitation License. Additionally, under the Nuisance Wildlife Control Operator License, all captured species must be released in suitable habitat at least five miles away from the capture location but within the same county of capture.

Reducing Damage by Managing Mammal Populations through the Use of Reproductive Suppression

Under this alternative, one method available to resolve requests for assistance would be the recommendation and the use of reproductive inhibitors, or chemical treatments, to reduce or prevent reproduction in mammals responsible for causing damage. Reproductive inhibitors are often considered for use where wildlife populations are overabundant and where traditional hunting or lethal control programs are not publicly acceptable (Muller et al. 1997). Use and effectiveness of reproductive control

as a wildlife population management tool is limited by population dynamic characteristics (*e.g.*, longevity, age at onset of reproduction, population size and biological/cultural carrying capacity), habitat and environmental factors (*e.g.*, isolation of target population, cover types, and access to target individuals), socioeconomic, and other factors.

Currently, the only reproductive inhibitor that is registered with the EPA for use on mammals is GonaCon™, which is only available for use on white-tailed deer (which is not considered in this EA). GonaCon™ is not currently registered for use in New York. If a reproductive inhibitor becomes available to manage a large number of mammal populations and has proven effective in reducing localized mammal populations, the use of the inhibitor could be evaluated under the proposed action as a method available that could be used in an integrated approach to managing damage as long as it is approved for use in New York.

A second method under reproductive suppression would be to employ the use of surgical sterilization. Sterilization seems to be a good alternative to manage certain mammal populations in certain situations, however, there are major concerns associated with the practice (Winter 2004). Looming largest is the potential transmission of diseases or parasites to humans, and the logistical difficulties of performing surgery in the field. A more in depth discussion of sterilization is found in the next alternative not considered, "Trap-Neuter-Release Program for Feral and Free-Ranging (Domestic) Cats."

Population modeling indicates that reproductive control is more efficient than lethal control only for some rodent and small bird species with high reproductive rates and low survival rates (Dolbeer 1998). The need to treat a sufficiently large number of target animals, multiple treatments, and the population dynamics of free-ranging populations place considerable logistic and economic constraints on the adoption of reproduction control technologies as a wildlife management tool for some species. Additionally, reproductive suppression is used for long-term population control rather than damage management. Reproductive suppression does not address acute damage problems and offending animals will continue to be present.

Trap-Neuter-Release Program for Feral and Free-Ranging (Domestic) Cats

This topic has undergone considerable debate in animal welfare and scientific communities for a number of years. The debate focuses on whether controlling feral, free-ranging, or invasive animal populations through Trap-Neuter-Release (TNR) programs, often including a vaccination component, are effective and alleviate problems (*i.e.*, diseases, predation, agricultural damage, and human safety).

Theoretically, TNR would work if all animals of one sex or both were sterilized. However, the probability of controlling free-ranging/feral cat breeds in the wild with this technique is not currently reasonable, especially with many animals being self-sufficient and not relying on humans to survive. There is also a chance of natural or artificial immigration to occur with cats that can help sustain the population. In addition, some individuals within a population can be trap-shy. Capturing or removing trap-shy individuals often requires implementing other methods.

Of major concern are the potential for diseases and parasites transmission to humans either from direct contact during sterilization or the risk of exposure after the animal is released. Once live-captured, performing sterilization procedures during field operations on anesthetized feral cats would be difficult. Sanitary conditions are difficult to maintain when performing surgical procedures in field conditions. To perform operations under appropriate conditions, live-captured animals would need to be transported from the capture site to an appropriate facility, which increases the threat from handling and transporting. A mobile facility could be used but would still require additional handling and transporting of the live-captured animals to the facility. Once the surgical procedure was completed, the animal would have to be

held to ensure recovery and transported back to the area where capture occurred. These surgical field operations are not within the level of expertise for WS-NY, hence rendering TNR programs to be considered an unreasonable damage management strategy.

Furthermore, TNR programs are often not as successful as desired and needed to reduce immediate threats posed by wildlife, especially when human safety is a concern (Barrows 2004, Levy and Crawford 2004, Jessup 2004, Winter 2004). Animals subjected to TNR would continue to cause the same problems[6] they caused before the TNR program was initiated because of slow attrition. TNR programs can take a decade or longer to reduce target species populations (Barrows 2004, Winter 2004) especially when acute issues need rapid solutions (Levy and Crawford 2004, Stoskopf and Nutter 2004). Several studies report that target species populations often remain stable or increase following TNR programs due to immigration and reproduction from other members of the groups (Castillo and Clarke 2003, Levy and Crawford 2004, Winter 2004) with little to no resolution of threats to human safety or damages (Barrows 2004, Slater 2004, Winter 2004).

Other concerns arise when considering the legality of TNR programs given the documented damage caused by target species, especially to native wildlife (Barrows 2004, Levy and Crawford 2004, Jessup 2004). Some people have questioned whether TNR programs are violating the Migratory Bird Treaty Act and the ESA because released animals may continue to kill migratory birds and/or endangered species (Barrows 2004, Levy and Crawford 2004, Jessup 2004). As a result of the continued threat to human safety created by TNR programs and the continued threat to T&E wildlife and native wildlife in general, this alternative will not be considered further.

Compensation for Mammal Damage Only

Reimbursement provides producers monetary compensation for losses; it does not remove the problem nor does it assist with reducing future losses. The compensation only alternative would require the establishment of a system to reimburse persons impacted by mammal damage. Under such an alternative, WS would not provide any technical assistance or direct damage management. Aside from lack of legal authority, analysis of this alternative indicates that the concept has many drawbacks (Wagner et al. 1997):

- It would require larger expenditures of money and labor to investigate and validate all damage claims to determine and administer appropriate compensation.
- Based on historical instances, compensation would most likely be less than full market value.
- In the case of predation on livestock or pets, compensation may not be a satisfactory solution for individuals who feel responsible for the well-being of their livestock or in situations where there is an emotional attachment to the animal.
- Compensation would give little incentive to resource owners to limit damage through improved cultural, husbandry, or other practices and management strategies.
- Not all resource owners would rely completely on a compensation program and lethal control would most likely continue as permitted by state law.
- Compensation would not be practical for reducing threats to human health and safety.

[6] Levy et al. (2003), Barrows (2004), and Jessup (2004) reported that sterilized cats that do not spend any time on courting and mating are left with more time to hunt than non-sterilized cats and therefore, continue to remain as potential reservoirs of animal and human disease, a social nuisance, and continue to hunt and kill protected species.

This alternative was eliminated from further analysis because it is not financially feasible or practical to provide compensation for all mammal damage.

Bounties

Payment of funds (bounties) for killing some mammals suspected of causing economic losses are illegal in New York and is stated as such in Environmental Conservation Law statute § 11-0531: "*Notwithstanding any other provision of this chapter, or any other law, rule or regulation to the contrary, it shall be unlawful for any department or division of this state, or any political subdivision thereof to pay bounties on the taking of wildlife, except when the state Department of Health, or any local health authorities, determine that a given type or class of animals constitute a health hazard as carriers or potential carriers of disease*." In addition, bounties have not been supported by most wildlife professionals for many years (Latham 1960, Hoagland 1993).

WS concurs with NYSDEC and wildlife professionals because of several inherent drawbacks and inadequacies in the payment of bounties. Bounties are often ineffective at controlling damage over a wide area, such as the entire state. The circumstances surrounding the lethal removal of animals are typically arbitrary and completely unregulated because it is difficult or impossible to assure animals claimed for bounty were not lethally removed from outside the area where damage was occurring. Also, MDM often targets problem individuals or groups of individuals and establishment of a bounty may not resolve conflicts created by those individuals. In addition, WS does not have the authority to establish a bounty program.

CHAPTER 3: ENVIRONMENTAL CONSEQUENCES

Chapter 3 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 environmental consequences of each alternative in relation to the issues identified. Additionally, this chapter compares the environmental consequences of the proposed action/no action alternative to the environmental consequences of the other alternatives.

<u>Environmental consequences can be direct, indirect, and cumulative.</u>

Direct Effects: Caused by the action and occur at the same time and place.

Indirect Effects: These are impacts caused by an action that are later in time or farther removed in distance, but are still reasonably foreseeable.

Cumulative Effects: As defined by CEQ (40 CFR 1508.7), these 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.

Irreversible and Irretrievable Commitments of Resources: Other than minor uses of fuels for motor vehicles and other materials, there are no irreversible or irretrievable commitments of resources.

3.1 ENVIRONMENTAL CONSEQUENCES FOR ISSUES ANALYZED IN DETAIL

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.

Issue 1: Effects of Damage Management on Populations of Target Mammal Species

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

A common issue is whether damage management actions would adversely affect the populations of target mammal species, especially when lethal methods are employed. Alternative 1 addresses requests for assistance received by WS through technical and direct operational assistance where an integrated approach to methods would be employed and/or recommended. Non-lethal methods can disperse or otherwise make an area unattractive to mammals causing damage; thereby, reducing the presence of mammals at the site and potentially the immediate area around the site where non-lethal methods are employed.

Many non-lethal methods are used to exclude, harass, and disperse target wildlife from areas where damage or threats are occurring. When effective, non-lethal methods would disperse mammals from the area resulting in a reduction in the presence of those mammals at the site where those methods were employed. Non-lethal methods help move mammals responsible for causing damage or threats to other areas with minimal impact on those species' populations. Non-lethal methods are not 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 are generally regarded as having minimal impacts on overall populations of wildlife since individuals of those species are unharmed. The use of non-lethal methods would not have adverse impacts on mammal populations under any of the alternatives. When permitted or requested by NYSDEC, WS could translocate or recommend translocation of target mammals as a non-lethal method of wildlife damage management.

The use of IWDM approved lethal methods, listed in Appendix B, could result in local population reductions in the area where damage or threats were occurring since mammals would be removed from the population. The number of mammals removed from the population using lethal methods would be dependent on the number of requests for assistance received, the number of mammals involved with the associated damage or threat (*i.e.*, the number of animals that WS believes necessary to effectively and measurably reduce damage), the number approved by the regulatory agency that manages the species in question, and the efficacy of methods employed.

WS may recommend mammals be harvested during the regulated hunting and/or trapping season for those species in an attempt to reduce the number of mammals causing damage. Managing mammal populations over broad areas could lead to a decrease in the number of mammals causing damage. Establishing hunting and trapping seasons and the allowed harvest during those seasons is the responsibility of the NYSDEC. WS does not have the authority to establish hunting or trapping seasons or to set allowed harvest numbers during those seasons. However, the harvest of those mammals with hunting and/or trapping seasons would be occurring in addition to any lethal removal that could occur by WS under the alternatives or recommended by WS.

Generally, WS only conducts damage management on species whose populations at the state level are high or are concentrated at the local level and usually only after they have caused damage. Table 3.1

identifies average annual lethal removal of animals by WS, proposed maximum annual WS removal, estimated annual harvest by hunters and trappers, and the percent of WS proposed removal compared to the average annual harvest estimates. No indirect effects were identified for this issue.

Table 3.1 Quantitative impacts of lethal removal for selected species in New York.

Species	Average Annual WS Removal 2012-2016	Maximum Proposed WS Annual Removal	NY Statewide Population Trend*	NY Statewide Average Annual Estimated Season Harvest*†	% WS Proposed Annual Removal Compared to Average Annual Harvest
American Beaver	105.6	500	increasing	32,500	1.54
American Marten	0	10	increasing	n/a	n/a
Black Bear	0	10	increasing	1,459	0.69
Bobcat	0	10	stable	639	1.56
Eastern Cottontail	33.6	200	stable	78,000	0.26
Coyote	21.4	200	stable	30,000	0.67
Deer Mouse	29	200	n/a	n/a	n/a
Eastern Chipmunk	0	100	n/a	n/a	n/a
Eastern Gray Squirrel	0.4	50	stable	150,000	0.03
Feral Swine‡	21.2	100	variable	n/a	n/a
Fisher	0.2	10	stable	2,150	0.47
Gray Fox	1.6	50	stable	9,200	0.54
House Mouse	6.6	200	n/a	n/a	n/a
Least Weasel	0	10	n/a	n/a	n/a
Long-tailed Weasel	0	10	stable	1,600	0.63
Mink	0	50	stable	18,300	0.27
Mole and Shrew	0.8	200	n/a	n/a	n/a
Muskrat	45.8	500	decreasing	150,000	0.33
Northern Flying Squirrel	0	50	n/a	n/a	n/a
Norway Rat‡	6.6	200	n/a	n/a	n/a
Raccoon	126.4	500	stable	58,000	0.86
Red Fox	10	50	stable	28,800	0.17
Red Squirrel	0	50	n/a	n/a	n/a
River Otter	0.6	10	stable	1,180	0.85
Short-tailed Weasel	0	10	n/a	n/a	n/a
Southern Flying Squirrel	0	50	n/a	n/a	n/a
Striped Skunk	14.2	200	stable	5,400	3.70
Virginia Opossum	5.2	50	stable	11,800	0.42
Vole	18.6	200	n/a	n/a	n/a
Woodchuck	188	1,000	n/a	n/a	n/a

‡ Feral swine and Norway rat are introduced invasive species.

* Population trends and harvest numbers provided by NYSDEC Bureau of Wildlife. Time periods for population trends are variable by species and represent the most current statewide data available.

† Black bear harvest estimate based on 2011-2015 seasons. Estimates for hunting harvest of coyote, gray fox, cottontail rabbit, raccoon, red fox, and Eastern gray squirrel are from the small game hunter survey for the 2010-2011 through 2015-2016 seasons. Estimate for the trapping harvest of beaver, coyote, gray fox, mink, muskrat, opossum, raccoon, red fox, skunk, and long-tailed weasel are from the trapper survey for the 2011-12 through 2015-16 seasons. Estimates of trapping harvest of bobcat, fisher, and otter based on the number of pelt-sealed animals from the 2011-12 through 2015-16 seasons.

American Beaver

The American beaver, New York State's official mammal, is found throughout the state, excluding Long Island. In 1993, it was reported that there was an estimated 17,500 active beaver colonies in the state, an increase of 19% from 1990 due to conservation efforts and limits to the trapping season length (NYSDEC 2017). Beavers will construct elaborate lodges and dams in order to alter the habitat to suit their needs. The major beaver/human conflicts arise from the potential risk of flooding in human inhabited or populated area as well as from the transmission of certain diseases such as *Giardia lambdia*. The current population trend for beavers in New York is increasing.

Beavers are classified as a furbearer species with a regulated annual trapping season that usually runs from November 1 through the beginning of April. Beavers have no daily or season limit for trapping. The number of beavers estimated as harvested annually by trappers from 2011 through 2016 is 32,500 (Table 3.1).

From 2012 through 2016, WS removed an average of 105.6 beavers each year. This represents 0.32% of all beavers annually harvested during the trapping season (Table 3.1).

Direct, Indirect, and Cumulative Effects:

Based on previous requests for assistance received by WS and anticipated future requests, up to 500 beavers could be lethally removed by WS annually to alleviate damage. WS' removal of 500 beavers would represent 1.54% of the estimated annual trapper harvest (Table 3.1). This level of removal is considered to be a low magnitude. It has been shown that beaver colony occupancy rates remain near 1.0 (all colonies are filled) when harvest rates are below 20% (Runge 1999). This suggests that beaver populations will remain stable after experiencing a reduction in population of up to 20%.

To address damage by beaver flooding and human health threats related to waterborne contaminants, WS may breach or remove beaver dams or install flow control devices during beaver damage management activities. Dam breaching, removal or installation of flow control devices are usually conducted in conjunction with local population reductions using trapping and/or shooting. Some animals that escape removal may lose or have limited access to stored food caches during winter months due to lower water levels and the presence of ice. This may limit winter survival of some individuals due to starvation or increased predation risk while feeding on land. However, reductions in local populations would result in lower interspecific competition for available food resources. WS' dam removal or flow manipulation strategy would have no effect on neighboring populations and would not alter habitat in a way that does not allow for future use by beaver or re-colonization.

Based on the best scientific data, WS proposed take level will have no adverse direct or cumulative effects on beaver populations. There is no bag limit during the length of the trapping season which provides an indication that cumulative removal, including removal for damage management, would not reach a level where overharvest of the beaver population would occur resulting in an undesired population decline. The NYSDEC's oversight of WS and the trapping season would ensure that the cumulative removal would not have a negative impact on the overall beaver population.

Black Bear

Although rarely seen by most people, black bear populations have increased in recent years throughout New York. According to NYSDEC, black bear population estimates are somewhere between 6,000 and

8,000 at a minimum in the state. Most bears are found in the Adirondack and Catskill regions, however there are growing populations throughout much of the Hudson Valley and Southern Tier. The opportunistic foraging behavior of bears has allowed some bears to inhabit semi-rural environments and exploit agricultural areas, human-produced garbage, and bird feeders.

The NYSDEC has established a hunting season on black bears that include an early bowhunting, crossbow, regular, and muzzleloading season running anytime between mid-September through mid-December depending on the region of the state. The number of estimated black bears harvested annually from the 2011-2015 seasons is 1,459 (Table 3.1).

Direct, Indirect, and Cumulative Effects:

Based on anticipated future requests for assistance, the removal of black bears by WS would not exceed 10 individuals annually. WS lethal removal of 10 black bears would represent 0.69% of the estimated annual hunter harvest (Table 3.1). This level of removal is well within the annual variation in estimated harvest and is not expected to negatively impact black bear populations across the state directly or indirectly. When appropriate and permitted by NYSDEC, bears will be live-trapped and translocated to a pre-approved designated area for release; however certain tolerance limits exist with bears that are a threat to humans or domesticated animals. These more problematic animals will not be eligible for translocation. The NYSDEC's oversight of WS and the trapping season would ensure that the cumulative removal would not have a negative impact on the overall bear population.

Coyote

Coyotes are found throughout New York and have been present in the state since the 1930s (NYSDEC 2017). They have adapted well to living in close proximity to humans and can occupy urbanized areas of the state including parts of New York City and Long Island. Although coyote densities vary based on local habitat quality, Knowlton (1972) published that density estimates of 0.5 to 1.0 coyotes per square mile would likely be applicable to coyote densities across much of their range. The current population trend for coyotes in New York is stable although they have increased their distribution into Long Island and New York City within the last 5-10 years.

The NYSDEC has established a hunting season on coyotes usually from October 1-March and trapping season from mid-October through mid-February with no bag limits on either season. The number of coyotes estimated as harvested annually from 2010 through 2016 is 30,000 (Table 3.1).

From 2012 through 2016, WS removed an average of 21.4 coyotes each year. This represents 0.07% of all coyotes annually harvested during the hunting/trapping seasons (Table 3.1).

Direct, Indirect, and Cumulative Effects:

Based on previous requests for assistance received by WS and anticipated future requests, the removal of coyotes by WS would not exceed 200 coyotes annually. WS lethal removal of 200 coyotes would represent 0.67% of the estimated annual hunter/trapper harvest (Table 3.1). This level of removal is insignificant and not expected to negatively impact coyote populations. Population modeling information suggests that a viable coyote population can withstand an annual removal of 70% of their population without causing a decline in the population (Connolly 1995).

No significant cumulative impacts are expected when WS' removal is added to the average annual sportsman harvest. Based on the limited proposed removal by WS and the fact that the NYSDEC does not enforce a bag limit on coyotes during the harvest, WS' activities will have no significant effects on statewide coyote populations. The NYSDEC's oversight of WS and the annual hunting/trapping seasons would ensure that the cumulative removal would not have a negative impact on the overall coyote population. When requested by NYSDEC coyotes can be live-trapped and translocated; however certain

tolerance limits exist with coyotes that are a direct threat to human or domestic animal safety. These, more problematic, animals will not be eligible for translocation.

Eastern Cottontail

The eastern cottontail is abundant and widespread across New York, occurring almost anywhere there is suitable habitat. The only place unsuitable for strong populations of eastern cottontail in New York are the central Adirondacks where winters are long and cold and there is a lack of brush or field habitat (Sullivan and Hilbert 2014). Cottontails do not distribute themselves evenly across the landscape, but tend to concentrate in favorable habitats such as brushy fence rows or field edges, gullies filled with debris, brush piles, areas of dense briars, or landscaped backyards where food and cover are suitable. Cottontails are rarely found in dense forest or open grasslands, but fallow crop fields may provide suitable habitat. Within these habitats, cottontails spend their entire lives in an area of 10 acres or less. Occasionally they may move a mile or so from a summer range to winter cover or to a new food supply. In suburban areas, cottontails are numerous and mobile enough to fill voids when cottontails are removed from an area. Population densities vary with habitat quality, but one cottontail per 0.4 hectares (1 acre) is a reasonable average (Craven 1994). Cottontails live only 12 to 15 months, yet make the most of time available reproductively. They can raise as many as six litters per year of one to nine young (usually four to six), having a gestation period of 28 to 32 days. If no young were lost, a single pair together with their offspring could produce five million cottontails in five years (Sullivan and Hilbert 2014).

Cottontails are classified as a small game species with a regulated annual hunting season that runs from early October through February. They have a daily bag limit of six. The number of cottontails estimated as harvested annually from 2010 through 2016 is 78,000 (Table 3.1).

From 2012 through 2016, WS removed an average of 33.6 cottontails each year (Table 3.1). This represents 0.04% of the annually harvested cottontails during the hunting season.

New England Cottontail

The New England cottontail is the only native cottontail that occurs east of the Hudson River mainly found in parts of Columbia, Dutchess, Putnam, and Westchester counties. This species has experienced population declines throughout much of its range due to the competition for resources with the more abundant eastern cottontail and from loss of habitat. It is currently listed in New York as a Species of Special Concern. The New England cottontail is virtually indistinguishable from the eastern cottontail by visual field marks, and the NYSDEC is asking rabbit hunters in eastern New York to submit samples from their harvests in order to determine the distribution of the New England cottontail. WS has partnered with NYSDEC and will submit any rabbit take to them that were removed within the focus area of New England cottontails. In addition, in 2015, NYSDEC initiated a statewide "Young Forest Initiative" aimed at creating young forest habitat that will benefit many species including the New England cottontail, American woodcock, ruffed grouse, and snowshoe hare to name a few. Information on the Young Forest Initiative can be found through the following link: http://www.dec.ny.gov/outdoor/104218.html.

Direct, Indirect, and Cumulative Effects:

Based on previous requests for assistance received by WS and anticipated future requests, up to 200 cottontails could be lethally removed by WS annually to alleviate damage. WS' removal of 200 cottontails would represent 0.26% of the estimated annual hunter harvest (Table 3.1). Additionally, the cottontail's ability to reproduce frequently allows for up to 85% of the annual population to die without

negative effects (Sullivan and Hilbert 2014). Based on the best scientific data, WS proposed take level will have no adverse direct or cumulative effects on cottontail populations.

Damages and threats of damages associated with cottontails most often occur in urban/suburban areas and at airports within New York where hunting is restricted or not allowed. Therefore, WS' proposed lethal removal would not adversely affect the ability to harvest cottontails during the annual regulated hunting season or result in adverse cumulative impacts to the statewide population.

Feral Swine

Feral swine (also known as wild pigs, wild boars, or feral hogs), are medium to large sized hoofed mammals that look similar to domestic swine and are an introduced species to New York. These animals breed any time of year but peak breeding times usually occur in the fall. Litters sizes usually range from one to 12 piglets (Mayer and Brisbin 2009). Given adequate nutrition, a feral swine population can reportedly double in just four months (Barrett and Birmingham 1994). Feral swine may begin to breed as young as four months of age and sows can produce two litters per year (Mayer and Brisbin 2009). Feral swine are found in variable habitat in most of the United States, with the highest densities occurring in the southern United States.

As part of the feral swine management program in New York, the NYSDEC and WS-NY have removed 143 feral swine in a 4-county area between 2008 and 2012 (USDA 2012). Wildlife Services estimated the size of the feral swine population stemming from those 143 feral swine if they had not been lethally removed by the two agencies using previously published information on reproduction, survival, and mortality. By presuming a 50:50 sex ratio in the population and an average litter size of six piglets per year with an 80% survival rate for piglets, WS estimated those 143 feral swine removed previously and their offspring could have produced over 10,000 swine in a 4-county area of central New York in six years (USDA 2012).

Currently, there are no known populations of feral swine in New York. If feral swine are detected again in New York, they and their damage may be addressed by the WS program in response to requests by federal agencies, state agencies, municipal agencies, or the public at any location. Agricultural producers may request assistance with managing damage to standing crops or disease threats to domestic livestock. Natural resource managers may request assistance to protect natural areas, parks or recreation areas, or T&E species. Public health agencies may request assistance in reducing feral swine densities where disease threats to people may exist.

Direct, Indirect, and Cumulative Effects:

To address any future requests for assistance associated with feral swine, the WS-NY program may use any legal methods among those outlined by the APHIS National Feral Swine Damage Management Program as suitable for feral swine damage management to annually remove up to 100 swine to ensure feral swine do not become reestablished in New York. Feral swine would most likely be lethally removed by trapping and/or shooting. Feral swine captured using live-capture methods would be subsequently euthanized pursuant to WS Directive 2.505 or in cases where the animal is a pet or raised for the purpose of agricultural production, WS could transfer custody of the animal to Animal Control within the county of capture. Executive Order 13112 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 associated damages, 2) monitor invasive species populations, 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 on invasive species. WS' lethal removal of feral swine would comply with this Executive Order. While elimination of feral swine

would be beneficial to the environment, the removal of 100 feral swine annually would not pose any significant direct or cumulative impacts to the population throughout the Eastern U.S.

Muskrat

Muskrats are common in New York and are found in every county. Muskrats will occupy a variety of aquatic habitats including ponds, lakes, and streams and prefer areas of dense vegetation, particularly cattails. Muskrat populations can fluctuate greatly from year to year depending on weather condition, disease outbreaks, habitat loss, and predation intensity. However, muskrats are highly prolific and produce two to three litters per year that average four to seven young per litter, which makes them relatively immune to overharvest (Boutin and Birkenholz 1987). The current population trend for muskrats in New York is decreasing.

Muskrats are classified as a furbearer species with a regulated annual trapping season from late October through February. The NYSDEC has also granted a hunting season only along Lake Champlain which runs from late October through mid-April. Muskrats have no daily or season limit for trapping. The number of muskrats estimated as harvested annually from 2011 through 2016 is 150,000 (Table 3.1).

From 2012 through 2016, WS removed an average of 45.8 muskrats each year. This represents 0.03% of all muskrats harvested annually during the hunting and trapping season.

Direct, Indirect, and Cumulative Effects:

Based on previous requests for assistance received by WS and anticipated future requests, up to 500 muskrats could be lethally removed by WS annually to alleviate damage. Using the average annual trapper harvest data to assess WS' impacts to the muskrat population, WS' removal of 500 muskrats would represent 0.33% of the estimated annual hunter/trapper harvest (Table 3.1). This level of removal is considered to be a low magnitude.

There is no bag limit during the length of the trapping season which provides an indication that cumulative removal, including removal for damage management, would not reach a level where overharvest of the muskrat population would occur resulting in an undesired population decline. The NYSDEC's oversight of WS and the trapping season would ensure that the cumulative removal would not have a negative impact on the overall beaver population.

Raccoon

Raccoons are found throughout New York and are extremely adaptable, which allows them to be found anywhere from remote forests to inner cities. Densities of raccoons vary across the state but may range anywhere from 20-40 raccoons per square mile in rural settings to 100 per square mile in places like Long Island (NYSDEC 2017). The current population trend for raccoons in New York is stable.

Raccoons are classified as a furbearer species in New York with a regulated annual hunting and trapping season. The hunting and trapping seasons usually runs from October through February. Raccoons have no daily or season limit for hunting or trapping. An average of 58,000 raccoons were harvested annually during the hunting and trapping seasons from 2010 through 2016 (Table 3.1).

From 2012 through 2016, WS removed an average of 126.4 raccoons each year. This represents 0.22% of all annually harvested raccoons.

Raccoons are one of the main vectors contributing to the spread of terrestrial rabies in New York. Starting in 1995, WS has been working with local, state and federal governments to try and address this problem by distributing ORV baits in areas of high vector densities. Information on the National Rabies Management Program can be found through the following link: https://www.aphis.usda.gov/aphis/ourfocus/wildlifedamage/programs/nrmp/ct_rabies.

Direct, Indirect, and Cumulative Effects:

Based on previous requests for assistance received by WS and anticipated future requests, up to 500 raccoon could be lethally removed annually by WS to alleviate damage. Using the average annual trapper/hunter harvest data to assess WS' impacts to the raccoon population, WS' removal of 500 raccoon would represent 0.86% of the estimated harvest (Table 3.1). The percent removed by WS is well within the annual variation in estimated harvest and is not expected to negatively impact raccoon populations.

There is no bag limit during the length of the hunting and trapping seasons which provides an indication that cumulative removal, including removal for damage management, would not reach a level where overharvest of the raccoon population would occur resulting in an undesired population decline. The NYSDEC's oversight of WS and the hunting/trapping seasons would ensure that the cumulative removal would not have a negative impact on the overall raccoon population.

Red Fox

Red fox are known to occur in every county of New York and prefer open country habitat with vegetative cover or forests away from human activity. In good habitat, up to three red fox can be found per square mile. Coyotes and red fox compete for food resources and habitat; in areas of high coyote populations, foxes can select more urban landscapes to avoid interactions with coyotes (Gosselink et al. 2003). This perpetuates higher potential for human/fox interaction and conflicts. The current population trend for red foxes in New York is stable.

Red fox are classified as a furbearer species in New York with a regulated annual hunting and trapping season that usually runs from October through February. Red fox have no daily or season limit for hunting or trapping. The number of red foxes estimated as harvested annually from 2010 through 2016 is 28,800 (Table 3.1).

From 2012 through 2016, WS removed an average of 10 red fox each year. This represents 0.03% of all annually harvested fox during the hunting and trapping seasons.

Direct, Indirect, and Cumulative Effects:

Based on previous requests for assistance received by WS and anticipated future requests, the removal of red fox by WS would not exceed 50 animals annually. WS lethal removal of 50 red fox would represent 0.17% of the estimated hunter/trapper harvest (Table 3.1). Based on the limited proposed removal by WS and the fact that the NYSDEC allows for unlimited harvest of red fox, WS' activities will have no significant effects on statewide red fox populations. There is no bag limit during the trapping and hunting seasons which provides an indication that cumulative removal, including removal for damage management, would not reach a level where overharvest of the red fox population would occur resulting in an undesired population decline. The NYSDEC's oversight of WS and annual hunting and trapping seasons would ensure that the cumulative removal would not have a negative impact on the overall red fox population.

Damages and threats of damages associated with red fox most often occur in urban/suburban areas and at airports where hunting is restricted or not allowed. Therefore, WS' proposed lethal removal would not adversely affect the ability to harvest red fox during the annual regulated hunting season.

Striped Skunk

Striped skunks are common and found throughout New York. The highest numbers of skunks are in hilly rural areas and in habitats that include a mixture of farmland, pastureland and timber. In some urban areas skunks are abundant, especially along railroads or high-tension power lines because these features provide travel ways and denning sites. Skunks are sensitive to outbreaks of diseases like rabies and distemper. These outbreaks can cause a skunk population to decline sharply. Skunks may be less

common now than they were 50 years ago because small farming operations have given way to larger, less diverse crop farms. The current population trend for skunks in New York is stable.

Skunks are classified as a furbearer species with a regulated annual hunting and trapping season. The NYSDEC has established a hunting and trapping season on skunks from mid-October through mid-February with no bag limits on both seasons. The number of skunks estimated as harvested annually by sport hunters/trappers from 2011 through 2016 is 5,400 (Table 3.1).

From 2012 through 2016, WS removed an average of 14.2 skunks each year. This represents 0.26% of all skunks harvested annually during the hunting and trapping seasons.

Direct, Indirect, and Cumulative Effects:

Based on previous requests for assistance received by WS and anticipated future requests, up to 200 skunks could be lethally removed by WS annually to alleviate damage. Using the average annual harvest to assess WS' impacts to the skunk population, WS' removal of 200 skunks would represent 3.70% of the estimated total number of skunks removed by hunters/trappers under NYSDEC permits (Table 3.1). This level of removal is considered to be a low magnitude and is not expected to have any adverse direct impacts. The NYSDEC's oversight of WS and the hunting/trapping seasons would ensure that the cumulative removal would not have a negative impact on the overall skunk population.

There is no bag limit during the length of the hunting and trapping seasons which provides an indication that cumulative removal, including removal for damage management, would not reach a level where overharvest of the skunk population would occur resulting in an undesired population decline.

Virginia Opossum

Virginia opossums are common, found throughout New York, and can occur in both rural and urban environments. Populations can exceed 200 opossums per square mile in favorable habitats. The current population trend for opossums in New York is stable.

Opossums are classified as a furbearer species with a regulated annual hunting and trapping season. The hunting/trapping seasons run from late October through mid-February. Opossums have no daily or season limit for hunting or trapping. The number of opossums estimated as harvested annually from 2011 through 2016 is 11,800 (Table 3.1).

From 2012 through 2016, WS removed an average of 5.2 opossums each year. This represents 0.04% of all opossums annually harvested during the hunting and trapping seasons.

Direct, Indirect, and Cumulative Effects:

Based on previous requests for assistance received by WS and anticipated future requests, up to 50 opossums could be lethally removed by WS annually to alleviate damage. Using the average annual harvest data to assess WS' impacts to the opossum population, WS' removal of 50 opossums would represent 0.42% of the estimated hunter/trapper harvest (Table 3.1). This level of removal is considered to be a low magnitude and is not expected to have any adverse direct impacts. The NYSDEC's oversight of WS and the hunting/trapping seasons would ensure that the cumulative removal would not have a negative impact on the overall opossum population.

There is no bag limit during the length of the hunting and trapping seasons which provides an indication that cumulative removal, including removal for damage management, would not reach a level where overharvest of the opossum population would occur resulting in an undesired population decline.

Woodchuck

The woodchuck is a large rodent, often seen in pastures, meadows, fields, and along highways in New York and is common throughout the state. Woodchucks have one litter a year and average five kits (Merritt 1987, Armitage 2003). Woodchucks breed at one year of age and live approximately four to five years. There is no regulated hunting or trapping season for woodchucks in New York. From 2012 through 2016, WS removed an average of 188 woodchucks each year.

Direct, Indirect, and Cumulative Effects:

Based on previous requests for assistance received by WS and anticipated future requests, up to 1,000 woodchucks could be lethally removed by WS annually to alleviate damage. This level of removal is considered to be a low magnitude and is not expected to have any adverse direct impacts.

Woodchuck damage management activities would target single animals or local populations of the species at sites where their presence is causing unacceptable damage to agriculture, human health or safety, natural resources, or property. Some local populations may be temporarily reduced as a result of damage management activities conducted under the proposed action alternative aimed at reducing damage at a local site. The no bag limit enforcement during the harvest of woodchucks, as regulated by the NYSDEC, provides an indication that densities are sufficient and that overharvest is unlikely to occur.

Free-ranging/Feral Domestic Cats

Free-ranging/feral (domestic) cats are not considered "wildlife" in New York, however, all captured cats whether or not they are targeted will be transferred to an animal shelter or other appropriate animal care facility. Free-ranging cats are socialized and can be strays, lost or abandoned pets, or pets with homes that are allowed to roam outside. Feral cats, in contrast, are not socialized to humans and are traditionally not kept as pets. The number of feral cats in New York is unknown. WS would coordinate with state and local authorities with jurisdiction over feral animal control in accordance with WS Directive 2.340.

Deliberately feeding free-ranging/feral cat communities have caused a perpetuating problem in the southern parts of New York by aiding in the continuation of the reproductive cycle and associated damage related with cats as well as by attracting large groups of black vultures (*Coragyps atratus*) to the area. Vultures will often scare the cats off of the food source and congregate in large numbers, inevitably causing damage to the surrounding area. Black vulture damage costs to property in New York are approximately $74,273 since 2005. The cause of this damage is due to their sharp beaks as well as their highly acidic stomach acid and urine.

Direct, Indirect, and Cumulative Effects:

Control efforts by WS would typically be limited to live-trapping, primarily using cage traps, with subsequent transport and transfer of custody to a local animal control officer or state licensed animal shelter. After relinquishing the feral cats to a local animal control officer or animal shelter, the care and the final disposition of the cat would be the responsibility of the animal control officer and/or animal shelter.

Based on previous requests for assistance received by WS and anticipated future requests, up to 50 feral/free-ranging cats could be trapped by WS personnel and transferred to an appropriate animal care facility such as a local humane society. Feral cats would be removed in projects aimed at protecting human safety and alleviating damage or threats of damage to agricultural resources, property, and natural

resources. The transfer of custody would have no significant adverse effects on local or statewide populations of these breeds in New York.

Miscellaneous Rodents

Rodents (mice, moles, voles, shrews, and rats) may be lethally removed by WS during wildlife hazard management, assessment, and monitoring at airports and airbases because these species serve as attractants to birds such as raptors and mammalian carnivores, which create direct hazards to aircraft. Additionally, these species may be lethally removed in or near rural parks and other structures to protect human health and safety or natural resources.

Large population fluctuations are characteristic of many small rodent populations and are highly prolific. For example, meadow voles may have up to 17 litters annually, typically with three to five young per litter, and deer mice have three to four litters with four to six young each (Burt and Grossenheider 1980, Merritt 1987).

The Allegheny woodrat (*Neotoma magister*) is the only rodent listed under the New York State endangered and threatened species list. Lethal take of this species is not permitted and take of this species is not proposed in this EA. Measures that will be taken to prevent incidental take of these species is discussed later in the EA.

Direct, Indirect, and Cumulative Effects:

The primary method of lethal removal for these species by WS would be trapping or toxicants. Removal of these species by WS would be done at specific isolated sites (*e.g.*, airports, parks, etc.). WS could lethally remove up to 200 small rodents annually, of any species composition except those species listed as threatened or endangered. Impacts from the level of removal to rodent and *Eulipotyphla* (moles and shrews) populations would be minimal due to the species' relatively high reproductive rates and because rodent/insectivore damage management recommended and conducted by WS would be at a limited number of specific local sites within the range of these species. Based upon the above information, WS limited lethal removal of these small rodents may cause temporary reductions at the specific local sites, but would have no adverse direct or cumulative impacts on overall populations of the species.

Norway rats are not native to North America and were accidentally released into this country. In the wild, the impacts of these species are seen by many as entirely detrimental (Burt and Grossenheider 1980). Executive Order 13112 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 associated damages, 2) monitor invasive species populations, 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 on invasive species. Although removal of these species up to and including extirpation could be seen as desirable, because of the productivity and distribution of the species and the limited nature of WS work, WS is unlikely to ever do more than limit populations at specific local sites. Based on the above information and WS' limited lethal removal of Norway rats, WS should have minimal effects on rat populations.

Other Target Species

Other target species, in addition to the mammals analyzed above, have been lethally removed in small numbers by WS or could be lethally removed when requested to resolve damage or threats of damage. Under the proposed action, WS could lethally remove up to 10 individuals each of the following species annually: bobcat, fisher, least weasel, long-tailed weasel, short-tailed weasel, American marten, river otter, and American bison. The removal of 10 individuals would not significantly impact the populations for any of these species as this level of removal is of considerably low magnitude. Additionally, WS anticipates the potential to remove up to 50 individuals each of the following species: red squirrel,

northern flying squirrel, southern flying squirrel, eastern gray squirrel, mink, and gray fox. The removal of 50 individuals would not significantly impact the populations for any of these species. Lastly, WS proposes the potential removal of up to 100 eastern chipmunks. Damage management activities would target single animals or local populations at sites where their presence was causing unacceptable damage to agriculture, natural resources, or property or poses a threat to human health or safety. Some local populations may be temporarily reduced as a result of removal activities to reduce damage at a local site. The estimated WS removal would be of low magnitude when compared to the number of those species harvested each year, and would be of extremely low magnitude when compared to the statewide population of these species. For example, black bear populations are increasing statewide and approximately 1,459 animals were harvested annually during the hunting seasons from 2011-2015. WS' proposed take of 10 bears annually would represent only 0.69% of the annual harvest during the hunting season.

WS will analyze the take of river otter as an indicator of no significant direct or cumulative adverse impacts. River otters represent the most sensitive species included in this group. Therefore, if otters are not adversely impacted by WS' removal, no other species in this group should suffer negative impacts to their statewide populations.

River Otter Population Information and Effects Analysis

The river otter has a range that stretches across most of Canada, Alaska, and the continental United States, except for desert regions and areas without trees. This species is associated with riparian habitats such as areas along streams, rivers, swamps, ponds, reservoirs, and lakes. Otters use pre-existing natural shelters such as beaver houses, beaver bank dens, muskrat houses, woodchuck dens, and hollow logs. Otters reach breeding maturity at two to three years of age. Breeding takes place from mid-winter to early spring with delayed implantation, meaning the embryo does not immediately implant to the uterus following sexual reproduction. This allows the gestation period to be extended for a specific time. Litter size ranges from one to six offspring, although most litters contain two or three offspring (Godin 1977).

River otters are classified as furbearers in New York, with a regulated trapping season. Otter population trends are stable across the state. Daily and annual take is dependent on location in the state. WS may be requested to address predation threats from river otters, but lethal removal would not exceed 10 animals annually. The average annual statewide fur harvest of river otters is 1,180 individuals between the 2011-2016 seasons. Using this five year annual harvest average, WS' lethal removal of 10 river otters per year would represent 0.85% of the average annual harvest of otters during the regular trapping season (Table 3.1). WS-NY average annual take from 2012-2016 has been 0.6 otters per year. Given that the otter population is much higher than the average annual season harvest, the lethal removal of river otters by WS would not have significant direct impacts to the river otter population and should not limit the ability to harvest river otters in the state during the regulated trapping season.

WS-NY Role with Bat Management

WS may receive requests to alleviate damage or threats of damage associated with bats. Aside from technical assistance, direct operational bat damage management by WS-NY is exclusively conducted at airports and involves reporting bat/aircraft strikes and post-strike sample collections. The majority of bat management (*i.e.*, removal from private residences) is left to the private sector.

Other WS mammal damage management may occur in areas that are adjacent to or in close proximity to habitats used by bats. These management activities are not expected to result in the removal of any trees or occur in any mines or caves, areas bats tend to occupy. Additionally, shooting and audio scaring devices are used almost exclusively at airports and in agricultural settings where habitat is primarily open

fields and noise levels are already elevated. There are currently two species of bats listed by the USFWS that occur in New York, the Indiana bat and the Northern long-eared bat. WS-NY made a "no effect" determination for these bat species based on the information above.

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 will facilitate planning and execution at regional and state levels, and coordination of surveillance data for risk assessment. It will 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. Data collected by organizations/agencies conducting research and monitoring will provide a broad species and geographic surveillance effort.

To provide the most useful information and a uniform structure for surveillance, strategies for collecting samples could be employed. Those strategies include:

Investigation of Illness/Death in Mammals: A systematic investigation of illness and death in mammals may be conducted to determine the cause of the illness or death. This strategy offers the best and earliest probability of detection if a disease is introduced into the United States. Illness and death involving wildlife are often detected by or reported to natural resource agencies and entities. This strategy capitalizes on existing situations of mammals without additional mammals being handled or killed.

Surveillance in Live Wild Mammals: This strategy involves sampling live-captured, apparently healthy mammals to detect the presence of a disease. Mammal species that represent the highest risk of being exposed to, or infected with, the disease because of their movement patterns, or mammals that may be in contact with species from areas with reported outbreaks would be targeted. Where possible, this sampling effort would be coordinated with local projects that already plan on capturing and handling the desired mammal species. Coordinating sampling with ongoing projects currently being conducted by state and federal agencies, universities, and others maximizes use of resources and minimizes the need for additional mammal capture and handling.

Surveillance in Harvested Mammals: Check stations for harvestable mammal species provide an opportunity to sample dead mammals to determine the presence of a disease, and could supplement data collected during surveillance of live mammals. Sampling of mammals harvested or lethally removed as part of damage management activities would focus on species that are most likely to be exposed to a disease.

Under the disease sampling strategies listed above that could be implemented to detect or monitor mammalian diseases, WS' implementation of those sampling strategies would not adversely affect mammal populations in the state. Sampling strategies that could be employed involve sampling live-captured mammals that could be released on site after sampling occurs. The sampling (*e.g.*, drawing blood, hair sample, fecal sample) and the subsequent release of live-captured mammals would not result in adverse effects since those mammals are released unharmed on site. In addition, sampling of sick, dying, or hunter harvested mammals would not result in the additive lethal take of mammals that would not have already occurred in the absence of a disease sampling program. Therefore, the sampling of mammals for diseases would not adversely affect the populations of any of the mammal species addressed in this EA and would not result in any take of mammals that would not have already occurred in the absence of disease sampling (*e.g.*, hunter harvest).

Summary

Evaluation of WS' activities relative to wildlife populations indicated that program activities will likely have no cumulative adverse effects on mammal populations. WS' actions would be occurring

simultaneously, over time, with other natural processes and human-generated changes that are currently taking place. Those activities include, but are not limited to:

- Natural mortality of wildlife
- Human-induced mortality through private damage management activities
- Human and naturally induced alterations of wildlife habitat and populations
- Annual and perennial cycles in population densities

All those factors play a role in the dynamics of wildlife 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. WS' actions taken to minimize or eliminate damage are constrained as to scope, duration and intensity, for the purpose of minimizing or avoiding impacts to the environment. WS evaluates damage occurring, including other affected elements and the dynamics of the damaging species; determines 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.

Alternative 2 - Non-lethal Mammal Damage Management Only by WS

Under this alternative, WS would not intentionally euthanize any target mammal species because no lethal methods would be used. Although, the methods employed by WS would not be intended to result in the death of an animal, some methods, such as live-capture and anesthesia (*i.e.* during trap and translocate), can result in injury or death of target animals despite the training and best efforts of management personnel. This type of removal is likely to be limited to a few individuals and would not adversely impact populations of any species.

Direct, Indirect, and Cumulative Effects:

Although WS lethal removal of mammals would not occur, it is likely that without WS conducting some level of lethal MDM activities for these species, private MDM efforts would increase. Cumulative impacts on target species populations would be variable depending upon actions taken by affected landowners/resource managers and the level of training and experience of the individuals conducting the MDM. Some individuals experiencing damage may take illegal or unsafe action against the problem species either unintentionally due to lack of training, or deliberately out of frustration of continued damage. In these instances, more target species may be lethally removed than with a professional MDM program (Alternative 1). Overall impacts on target species populations would be similar to or slightly more significant than Alternative 1 depending upon the extent to which resource managers use the assistance provided by WS. However, for the reasons presented in the population effects analysis in section 3.1, it is unlikely that target mammal populations would be adversely impacted by implementation of this alternative.

Alternative 3 - No Mammal Damage Management Conducted by WS

Under this alternative, WS would not conduct mammal damage management activities in the state. WS would have no direct involvement with any aspect of addressing damage caused by mammals and would provide no technical assistance. Mammals could continue to be lethally removed to resolve damage and/or threats occurring either through permits issued by the NYSDEC, during the regulated hunting or

trapping seasons, or without a permit as allowed in certain situations by state laws and regulations. Management actions taken by non-federal entities would be considered the *environmental status quo*.

Direct, Indirect, and Cumulative Effects:

Local mammal populations could decline, stay the same, or increase depending on actions taken by those persons experiencing mammal damage. Some resource/property owners may take illegal, unsafe, or environmentally harmful action against local populations of mammals out of frustration or ignorance. While WS would provide no assistance under this alternative, other individuals or entities could conduct lethal damage management resulting in impacts similar to the proposed action.

Since mammals would still be lethally removed under this alternative, the potential effects on the populations of those mammal species would be similar among all the alternatives for this issue. Any actions to resolve damage or reduce threats associated with mammals could occur by other entities despite WS' lack of involvement under this alternative. However, for the reasons presented in the population effects analysis in section 3.1, it is unlikely that target mammal populations would be adversely impacted by implementation of this alternative.

Issue 2 – Effects of Damage Management on Non-target 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 mammals. The potential effects on the populations of non-target wildlife species, including T&E species, are analyzed below.

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

The potential for adverse effects to non-targets occurs from the employment of methods to address mammal damage. Under the proposed action, WS could provide both technical assistance and direct operational assistance to those requesting assistance. The use of non-lethal methods as part of an integrated direct operational assistance program would be similar to those risks to non-targets discussed in the other alternatives.

WS personnel are experienced and trained in wildlife identification and to select the most appropriate methods for taking targeted animals and excluding non-target species. To reduce the likelihood of capturing non-target wildlife, WS would employ the most selective methods for the target species, would employ the use of attractants that are as specific to target species as possible, and determine placement of methods to avoid exposure to non-targets. Management actions are directed towards specific animals or groups of animals responsible for causing damage or posing threats. WS consults with the USFWS and the NYSDEC to determine the potential risks to federally- and state-listed threatened and endangered species in accordance with the ESA and state laws. Non-lethal methods are given priority when addressing requests for assistance (WS Directive 2.101). Non-target animals captured in traps are released unless it is determined by WS that the animal would not survive or that the animal cannot be safely released. When the appropriate situation arises and when permitted by the NYSDEC, WS can trap and translocate non-target species. WS would only employ methods in response to a request for assistance after the property owner or manager has signed a document agreeing to allow specific methods be used on property they own and/or manage. SOPs to prevent and reduce any potential adverse impacts on non-targets are discussed in Chapter 2. Despite the best efforts to minimize non-target lethal removal during program activities, the potential for adverse impacts to non-targets exists when applying both non-lethal and lethal methods to manage damage or reduce threats to safety.

Non-Lethal Methods

Non-lethal methods have the potential to cause adverse effects to non-targets primarily though physical exclusion, frightening devices or deterrents (see Appendix B). Any exclusionary device erected to prevent access to resources could also potentially exclude non-target species, therefore adversely impacting that species. The use of frightening devices or deterrents may also disperse non-target species from the immediate area where they are employed.

Other non-lethal methods available for use under any of the alternatives are live-capture traps (see Appendix B). WS would use and recommend the use of target-specific attractants and place them or recommend they be placed in areas where target species are active to reduce the risk of capturing non-targets. WS would monitor or recommend traps be monitored frequently so non-target species can be released unharmed.

Eagles may occur in or near areas where damage management activities are conducted. Routine activities conducted by WS' personnel under the proposed action/no action alternative could occur in areas where eagles are present, which could disrupt the current behavior of an eagle or eagles that are nearby during those activities. As discussed previously, "*take*" as defined by the Bald and Golden Eagle Protection Act, includes those actions that "*disturb*" eagles. Disturb has been defined under 50 CFR 22.3 as those actions that cause or are likely to cause injury to an eagle, a decrease in productivity, or nest abandonment by substantially interfering with their normal breeding, feeding, or sheltering behavior.

WS has reviewed those methods available under the proposed action/no action alternative and the use patterns of those methods. The routine measures that WS conducts would not meet the definition of disturb requiring a permit for the take of eagles. The USFWS states, *"Eagles are unlikely to be disturbed by routine use of roads, homes, or other facilities where such use was present before an eagle pair nesting in a given area. For instance, if eagles build a nest near your existing home, cabin, or place of business you do not need a permit."* (USFWS 2012). Therefore, activities that are species specific and are not of a duration and intensity that would result in disturbance as defined by the Act would not result in non-purposeful take (*e.g.*, unintentional disturbance of an eagle). Activities, such as walking to a site, discharging a firearm, riding an ATV or driving a boat, generally represent short-term disturbances to sites where those activities take place. WS would conduct activities that are located near eagle nests using the National Bald Eagle Management Guidelines (USFWS 2007). The categories that encompass most of these activities are Category D (off-road vehicle use), Category F (non-motorized recreation and human entry), and Category H (blasting and other loud, intermittent noises). These categories generally call for a buffer of 330 to 660 feet for Category D and F, and a ½-mile buffer for Category H. WS would take active measures to avoid disturbance of bald eagle nests by following the National Bald Eagle Management Guidelines. However, other routine activities conducted by WS do not meet the definition of "*disturb*" as defined under 50 CFR 22.3. Those methods and activities would not cause injuries to eagles and would not substantially interfere with the normal breeding, feeding, or sheltering behavior of eagles.

Lethal Methods

As previously mentioned, eagles may occur in or near areas where management activities are conducted under the proposed action/no action alternative. Non-purposeful lethal removal of a bald or golden eagle or their nests is considered a "*take*" as defined by the Bald and Golden Eagle Protection Act. WS has reviewed those methods available under the proposed action/no action alternative and the use patterns of those methods. WS determined that the SOPs that WS uses while conducting damage management activities reduces the likelihood that eagles would be lethally removed (*e.g.*, prohibiting placement of a cable restraint within 50 feet of a carcass which may attract eagles).

All of the lethal methods listed in Appendix B could be available under this alternative. Some of these methods include:

Shooting - In cases where shooting was selected as an appropriate method, identification of an individual target would occur prior to application, eliminating risks to non-targets. Additionally, suppressed firearms would be used when appropriate to minimize noise impacts to non-targets.

Euthanasia - Non-target species captured during the implementation of non-lethal capture methods can usually be released prior to euthanasia which occurs subsequent to live-capture.

Cable Restraints - WS would use cable restraints in compliance with applicable federal, state and local laws and regulations (WS Directive 2.210) as well as WS Directives to minimize risks to non-targets.

Bodygrip Trap (e.g., Conibear) - WS would use bodygrip traps in compliance with applicable federal, state and local laws and regulations (WS Directive 2.210) as well as WS Directives to minimize risks to non-targets.

Rodenticides - A common concern regarding the use of rodenticides is the potential risk to non-target animals, including threatened and endangered species. Rodenticides would be used by WS in accordance with their label and WS Directive 2.401 to minimize risks to non-targets. Rodenticides will not be used in a manner that would contaminate drinking water supplies.

Fumigants - Only fumigants and toxicants registered with the EPA and the NYSDEC Division of Materials Management pursuant to the FIFRA would be recommended and used by WS under this alternative. Fumigants and toxicants, including restricted use toxicants, could be used by licensed non-WS' pesticide applicators; therefore, WS' use of fumigants and toxicants would provide no additional negative impacts on non-target species as these substances could be used in the absence of WS' involvement. WS personnel are trained and licensed in the safe and effective use of fumigants and toxicants as well as the behavior and biology of both target and non-target wildlife species.

Direct, Indirect, and Cumulative Effects:

The persistent use of non-lethal methods would likely result in the dispersal or abandonment of those areas where non-lethal methods are employed of both target and non-target species. Therefore, any use of non-lethal methods has similar results on both non-target and target species. However, the potential impacts to non-targets, like the impacts to target species, are expected to be temporary. WS would not employ or recommend these methods be employed over large geographic areas or at such intensity that essential resources would be unavailable and that long term adverse impacts to non-target populations would occur. Non-lethal methods are generally regarded as having minimal impacts on populations because individuals are unharmed. Therefore, non-lethal methods would not have any significant adverse impacts on non-target populations of wildlife including threatened and endangered species under this alternative.

Only those repellents registered with the EPA and NYSDEC pursuant to the FIFRA would be recommended and used by WS under this alternative. Therefore, the use and recommendation of repellents would not have negative impacts on non-target species when used according to label requirements. Most repellents for mammals pose a very low risk to non-targets when exposed to or when ingested.

Mammals could still be lethally removed during the regulated harvest season, when causing damage, and through the issuance of permits by the NYSDEC under this alternative. WS would also employ and/or recommend lethal methods under the proposed action alternative to alleviate damage caused by target mammals. Lethal methods available for use to manage damage caused by mammals under this alternative would include shooting, body-gripping traps, cable restraints, snap traps, euthanasia after live-capture, and registered fumigants and toxicants.

The use of firearms is essentially selective for target species since animals are identified prior to application; therefore, no adverse impacts to non-targets are anticipated from use of this method.

WS personnel's pesticide training in combination with following label requirements presents a low risk of exposure of non-targets species to registered fumigants and toxicants. Additionally, WS personnel would follow all label directions during pesticide applications. As appropriate, WS would use signage and other means of notification to ensure the public is aware of fumigant or toxicant applications or applications sites, to ensure non-target domestic species such as dogs are not exposed.

While every precaution is taken to safeguard against taking non-targets during operational use of methods and techniques for resolving damage and reducing threats caused by mammals, the use of such methods can result in the incidental lethal removal of unintended species. Those occurrences are infrequent and should not affect the overall populations of any species under the proposed action. WS' lethal removal of non-target species during activities to reduce damage or threats to human safety associated with mammals is expected to be extremely low to non-existent. Between FY 2012 and FY 2016, only 12 non-target mammals were unintentionally lethally removed by WS-NY (one feral/free ranging cat, one Virginia opossum, one eastern cottontail, seven raccoons, and two striped skunks). WS would monitor the lethal removal of non-target species to ensure program activities or methodologies used in mammal damage management do not adversely impact non-targets. Methods available to resolve and prevent mammal damage or threats when employed by trained, knowledgeable personnel are selective for target species. WS would annually report to the NYSDEC any non-target lethal removal to ensure lethal removal by WS is considered as part of management objectives established. The potential impacts to non-targets are similar to the other alternatives and are considered to be minimal to non-existent.

The proposed MDM could benefit many other wildlife species that are impacted by predation, habitat modification or competition for resources. For example, fox often feed on the eggs, nestlings, and fledglings of ground nesting bird species. This alternative has the greatest possibility of successfully reducing mammal damage and conflicts to wildlife species since all available methods could possibly be implemented or recommended by WS.

T&E Species Effects

Special efforts are 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 T&E effects are described in Chapter 2 of this EA.

Federally Listed Species - The list of species federally designated as threatened and endangered in New York as determined by the USFWS and the National Marine Fisheries Service was obtained and reviewed during the development of this EA. After review of the T&E species listed in New York and the activities described in this EA, WS had determined that activities conducted pursuant to the proposed action would either have a "no effect" determination, or a "may affect but not likely to adversely affect" determination on T&E species listed in New York or their critical habitats (Appendix C).

State Listed Species - The current list of state listed species as determined by the NYSDEC was obtained and reviewed during the development of the EA (see Appendix D). WS has consulted with the NYSDEC to determine if the proposed activities would adversely affect those species currently listed by the state.

Bog Turtle Special Consideration in New York

WS considers the importance of avoiding disturbance and lethal take of all T&E species to be essential. Here we provide the example of the bog turtle as a species of special consideration in New York and how WS would employ professional knowledge and training experience to minimize the impacts that MDM has on this species.

The bog turtle is a federally threatened species that occurs mainly along Lake Ontario and in the lower Hudson Valley of New York. It is New York's smallest turtle species, can live up to 30 years, and has a slow reproductive rate, usually taking 8-11 years to reach sexual maturity (NYSDEC 2017). Beaver damage management by WS poses the greatest potential impact on bog turtles through alteration of the wetland habitat that they require. In general, trapping and removing beavers does not have the potential to alter bog turtle habitats and therefore hinder their population. The concern comes from the removal of beaver dams and subsequently changing the water levels in the wetland. WS' main motivation during beaver damage management is not driven by removing of dams but rather removing the beavers themselves. The manipulation of dams by WS is most often carried out by using hand tools rather than excavation; this allows for changes in the wetland water level to be gradual and less dramatic, therefore limiting the intensity of change and having less of an impact on T&E species, such as the bog turtle, that rely on that habitat.

Summary of Non-target Animal Impact Analysis

WS continually monitors, evaluates and makes modifications as necessary to methods or strategies when providing direct operational assistance, to not only reduce damage but also to minimize potentially harmful effects to non-targets. Additionally, WS consults as required with the USFWS and the NYSDEC to determine the potential risks to eagles and federally- and state-listed threatened and endangered species in accordance with the Bald and Golden Eagle Protection Act, ESA, and state laws. WS annually reports to these entities to ensure that any non-target lethal removal by WS is considered as part of management objectives. Furthermore, WS has partnered with NYSDEC and will provide biological samples or data for monitoring and research for both non-target and target species (*e.g.* New England cottontail). Potential direct and cumulative impacts to non-targets, including threatened and endangered species, from the recommendation of methods by WS under this alternative would be expected to be insignificant. No indirect effects were identified for this issue.

Alternative 2 - Non-lethal Mammal Damage Management Only by WS

Under this alternative, risks to non-target species from WS actions would likely be limited to the use of frightening devices, exclusionary devices, and the risks of unintentional capture of a non-target in a live-capture device as outlined under Alternative 1. Trap and translocation of non-target species can will be considered by WS when appropriate and when permitted by the NYSDEC. Although the availability of WS assistance with non-lethal MDM methods could decrease incentives for non-WS entities to use lethal MDM methods, non-WS efforts to reduce or prevent damage could result in less experienced persons implementing lethal MDM methods and lead to a greater removal of non-target wildlife.

Direct, Indirect, and Cumulative Effects:

Under this alternative, WS' efforts to protect rare, threatened or endangered species would not be as effective as the preferred alternative (Alternative 1) because WS would be unable to access lethal techniques if non-lethal techniques are ineffective. Lethal efforts to protect these species would have to be conducted by other natural resource management entities. Capture and release (*e.g.*, for disease monitoring) and capture and relocate would be allowed under this alternative. There is the remote chance that the capture devices could result in the death of a non-target animal. However, given that these devices would be applied with provisions to keep the target animal alive, the risks to non-target species are very low and would not result in adverse impacts on non-target species populations.

If mammal damage problems were not effectively resolved by non-lethal control methods, members of the public may resort to other means of lethal control such as the use of shooting or the use of pesticides. This could result in less experienced persons implementing control methods and could lead to greater risks to non-target wildlife than the proposed action. For example, shooting by persons not proficient at mammal identification could lead to killing of non-target mammals. It is hypothetically possible that frustration caused by the inability to reduce damage and associated losses could lead to illegal use of chemical toxicants which could lead to unknown effects on local non-target species populations, including T&E species. Hazards to raptors, including bald eagles, could therefore be greater under this alternative if chemicals that are less selective or that cause secondary poisoning are used by frustrated private individuals. While cumulative impacts would be variable, WS does not anticipate any significant cumulative impacts from this alternative.

T&E Species Effects

WS' impacts on T&E species would be similar to the non-lethal methods used under Alternative 1. Risks to T&E species from increased private efforts to address damage management problems will vary depending upon the training and level of experience of the individual conducting the MDM. As stated above, frustrated individuals may resort to use of unsafe or illegal methods like poisons which may increase risks to T&E species. Risks to T&E species may be lower with this alternative than with Alternative 3 because people would have ready access to assistance with non-lethal MDM techniques. WS, with the assistance of NYSDEC, could advise individuals as to the potential presence of state and federally listed species in their area.

Alternative 3 - No Mammal Damage Management Conducted by WS

Under this alternative, WS would not be directly involved with mammal damage management activities. Therefore, no direct impacts to non-targets or T&E species would occur by WS under this alternative. Mammals would continue to be lethally removed under permits issued by the NYSDEC, harvest would continue to occur during the regulated season, and non-native mammal species could continue to be lethally removed without the need for a permit.

Direct, Indirect, and Cumulative Effects:

The ability to reduce damage and threats of damage caused by mammals to other wildlife species, including T&E species, and their habitats would be variable based upon the skills and abilities of the person implementing damage management actions under this alternative. The risks to non-targets and T&E species would be similar across the alternatives since most of those methods described in Appendix B would be available across the alternatives. If those methods available were applied as intended, direct, indirect, and cumulative effects to non-targets would be minimal to non-existent. If methods available were applied incorrectly or applied without knowledge of mammal behavior, risks to non-target wildlife

would be higher under this alternative. If frustration from the lack of available assistance causes those persons experiencing mammal damage to use methods that were not legally available for use, direct, indirect, and cumulative effects on non-targets would be higher under this alternative. People have resorted to the use of illegal methods to resolve wildlife damage that have resulted in the lethal removal of non-target wildlife (*e.g.*, White et al. 1989, USFWS 2001, FDA 2003). Therefore, adverse direct, indirect, or cumulative impacts to non-targets, including T&E species, could occur under this alternative; however WS does not anticipate any significant cumulative impacts.

T&E Species Effects

WS will not have any direct impact on T&E species. Risks to T&E species from increased private efforts to address damage management problems will vary depending upon the training and level of experience of the individual conducting the MDM. As stated above, frustrated individuals may resort to use of unsafe or illegal methods like poisons which may increase risks to T&E species. Risks to T&E species may be higher with this alternative than with the other alternatives because WS would not have any opportunity to provide advice or assistance with the safe and effective use of MDM techniques or have the opportunity to advise individuals regarding the presence of T&E species.

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

A common concern is the potential adverse effects available methods could 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 Current Adaptive Integrated Mammal Damage Management Program (No Action/Proposed Action)

WS would use the Decision Model to determine the appropriate method or methods that would effectively resolve requests for assistance. The methods chosen would be continually evaluated for effectiveness and, if necessary, additional methods could be employed. Risks to human safety from technical assistance conducted by WS would be similar to those risks addressed under the other alternatives and minimal to non-existent. The use of non-lethal methods as part of an integrated approach to managing damage that would be employed as part of direct operational assistance by WS would be similar to those risks addressed by the other alternatives and also minimal.

WS' employees who conduct MDM activities would be knowledgeable in the use of methods, wildlife species responsible for causing damage or threats, 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 mammals. Prior to and during the utilization of lethal methods, WS' employees would consider risks to human safety based on location and method. Risks to human safety from the use of methods would likely be greater in urban areas when compared to 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. Activities would generally be conducted when human activity is minimal (*e.g.*, early mornings, at night) and/or in areas where human activities are minimal (*e.g.*, in areas closed to the public).

Lethal methods available under the proposed action would include the use of firearms, kill traps (*e.g.*, body-grip traps, snap traps, glue traps), live-capture followed by euthanasia, registered fumigants and toxicants, and the recommendation that mammals be harvested during the regulated hunting or trapping season established for those species by the NYSDEC.

Other live-capture devices, such as cannon nets, pose minor safety hazards since activation of the device occurs by trained personnel after target species are observed in the capture area of the net. Lasers also pose minimal risks to the public since application occurs directly to target species by trained personnel which limits the exposure of the public to misuse of the method.

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 drugs, reproductive inhibitors, fumigants, toxicants, and repellents (Appendix B). The use of immobilizing drugs under the identified alternatives would only be administered to mammals 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 are used to temporary handle and transport animals to lessen the distress of the animal from the experience. Drug delivery to immobilize mammals is likely to occur on site with close monitoring of the animal to ensure proper care of the animal. Immobilizing drugs are fully reversible with a full recovery of sedated animals occurring.

Euthanizing drugs would be administered under similar circumstances to immobilizing drugs under the relevant proposed alternatives. Euthanized animals would be disposed of in accordance with WS Directives and in accordance with label directions; therefore, would not be available for harvest and consumption. If mammals were immobilized for sampling or translocation and released, risks could occur to human safety if harvest and consumption occurred. SOPs employed by WS to reduce risks are discussed in Chapter 2.

The cooperator requesting assistance is made aware through a MOU, CSA, or a similar document that those methods agreed upon could potentially be used on property owned or managed by the cooperator; thereby, making the cooperator aware of the use of those methods on property they own or manage to identify any risks to human safety associated with the use of those methods.

Direct, Indirect, and Cumulative Effects:

To help ensure safe use and awareness, WS' employees who use firearms during official duties are required to attend an approved firearm safety training course and attend a safety training course in accordance with WS Directive 2.615 to remain certified for firearm use. 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 are deemed appropriate to alleviate or reduce damage and threats to human safety when conducting activities. WS and cooperating agencies would work closely with cooperators requesting assistance to ensure all safety issues are considered before firearms are deemed appropriate for use. The use of all methods, including firearms, must be agreed upon with the cooperator to ensure the safe use of those methods.

Restraining devices and body-gripping traps are typically set in situations where human activity is minimal to ensure public safety. Restraining devices and body-gripping traps rarely cause serious injury to humans and are triggered through direct activation of the device. Therefore, human safety concerns associated with restraining devices and body-gripping traps used to capture wildlife, including mammals, require direct contact to cause bodily harm. Again, restraining devices are not located in high-use areas to ensure the safety of the public and pets. Signs warning of the use of those tools in the area are posted for

public view at access points to increase awareness that those devices are being used and to avoid the area, especially pet owners.

All WS' personnel who handle and administer chemical methods would be properly trained in the use of those methods. Training and adherence to agency directives would ensure the safety of employees applying chemical methods. Mammals euthanized by WS or lethally removed using chemical methods would be disposed of in accordance with WS Directive 2.515. All euthanasia would occur in accordance with AVMA guidelines and in the absence of the public to further minimize risks, whenever possible. All WS' personnel who apply fumigants and toxicants registered with the EPA pursuant to the FIFRA are licensed as pesticide applicators by the NYSDEC Division of Materials Management. WS personnel are trained in the safe and effective use of fumigants and toxicants. Training and adherence to agency directives and label requirements would ensure the safety of both employees applying fumigants and toxicants and members of the public. To the extent possible, toxicants, treated baits, and/or mammals lethally removed with fumigants or toxicants by WS will be collected and/or disposed of in accordance with label requirements to reduce risk of secondary toxicity to people who may be exposed to them or attempt to consume them. WS would utilize locking bait stations to restrict access of children to rodenticides such as anticoagulants. As appropriate, WS would use signage and other means of notification to ensure the public is aware of fumigant or toxicant applications or applications sites, to ensure people, including children, are not exposed.

The recommendation of repellents or the use of those repellents registered for use to disperse mammals could occur under the proposed action as part of an integrated approach to managing mammal damage. Those chemical repellents that would be available to recommend for use or be directly used by WS under this alternative would also 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. WS' involvement, either through recommending the use of repellents or the direct use of repellents, would ensure that label requirements of those repellents are 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 could be lessened through WS' participation.

The recommendation by WS that mammals be harvested during the regulated hunting and/or trapping seasons which are established by the NYSDEC would not increase risks to human safety above those risks already inherent with hunting or trapping those species. Recommendations of allowing hunting and/or trapping on property owned or managed by a cooperator to reduce mammal populations which could then reduce damage or threats would not increase risks to human safety. Safety requirements established by the NYSDEC for the regulated hunting and trapping seasons would further minimize risks associated with hunting and trapping. Although hunting and trapping accidents do occur, the recommendation of allowing hunting and/or trapping to reduce localized populations of mammals would not increase those risks.

There are no known occurrences of adverse direct or indirect effects to human safety from WS' use of methods to alleviate mammal damage from FY 2003 through FY 2016. The risks to human safety from the use of non-lethal and lethal methods, when used appropriately and by trained personnel, are considered low. No adverse direct effects to human health and safety are expected through the use of live-capture traps and 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, WS personnel are properly trained on the safe storage, transportation, and use of 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. WS does not anticipate any additional adverse cumulative impacts to human safety from the use of firearms when recommending that mammals be harvested during regulated hunting seasons to help alleviate damage.

Alternative 2 - Non-lethal Mammal Damage Management Only by WS

Under this alternative, WS would not use lethal MDM methods. Concerns about human health risks from WS' use of lethal mammal damage management methods would be alleviated because no such use would occur. However, most lethal methods would still be available to licensed pest control operators. Benefits to the public from WS' MDM activities will depend on the ability of WS to resolve problems using non-lethal methods and the effectiveness of non-WS MDM efforts. In situations where risks to human health and safety from mammals cannot be resolved using non-lethal methods, benefits to the public will depend on the efficacy of non-WS use of lethal MDM methods. If lethal MDM programs are implemented by individuals with less experience than WS, they may not be able to safely and effectively resolve the problem or it may take longer to resolve the problem than with a WS program.

Direct, Indirect, and Cumulative Effects:

Since most methods available to resolve or prevent mammal 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 Mammal Damage Management Conducted by WS

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

Direct, Indirect, and Cumulative Effects:

Similar to Alternative 2, reproductive inhibitors, immobilizing drugs, and euthanasia chemicals would not be available under this alternative to those persons experiencing damage or threats from mammals unless proper training and certifications were obtained. However, fumigants, toxicants, and repellents would continue to be available to those persons with the appropriate pesticide applicators license. Since most methods available to resolve or prevent mammal damage or threats are available to anyone, the threats to human safety from the use of those methods are similar between the alternatives. Habitat modification and harassment methods are also generally regarded as posing minimal adverse direct and indirect effects to human safety. Although some risks to safety are likely to occur with the use of pyrotechnics, propane cannons, and exclusion devices, those risks are minimal when those methods are used appropriately and in consideration of human safety. However, methods employed by those not experienced in the use of methods or are not trained in their proper use, could increase threats to human safety. Overall, the

methods available to the public, when applied correctly and appropriately, pose minimal risks to human safety.

Issue 4 - Humaneness and Animal Welfare Concerns of Methods

The issues of method humaneness relating to the alternatives are discussed below.

Alternative 1 - Continue the Current Adaptive Integrated Mammal 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 could include non-lethal and lethal methods integrated into direct operational assistance. Under this alternative, non-lethal methods would be used by WS which are generally regarded as humane. Non-lethal methods would include resource management methods (*e.g.*, crop selection, habitat modification, modification of human behavior), exclusion devices, frightening devices, reproductive inhibitors, nets, repellents and live capture traps for trap and translocation.

WS may use EPA registered and approved chemicals to manage damage caused by some mammals. Some individuals consider the use of such chemicals to be inhumane. WS personnel are experienced, professional, and humane in their use of management methods and always follow label directions. Under this alternative, mammals would be removed by experienced WS personnel using the best and most appropriate method(s) available.

The AVMA states "...euthanasia is the act of inducing humane death in an animal" and "...that if an animal's life is to be taken, it is done with the highest degree of respect, and with an emphasis on making the death as painless and distress free as possible" (AVMA 2013). Additionally, euthanasia methods should minimize any stress and anxiety experienced by the animal prior to unconsciousness. Although use of euthanasia methods to end an animal's life is desirable, as noted by the AVMA, "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).

AVMA (2013) notes, "While recommendations are made, it is important for those utilizing these recommendations to understand that, in some instances, agents and methods of euthanasia identified as appropriate for a particular species may not be available or may become less than an ideal choice due to differences in circumstances. Conversely, when settings are atypical, methods normally not considered appropriate may become the method of choice. Under such conditions, the humaneness (or perceived lack thereof) of the method used to bring about the death of an animal may be distinguished from the intent or outcome associated with an act of killing. Following this reasoning, it may still be an act of euthanasia to kill an animal in a manner that is not perfectly humane or that would not be considered appropriate in other contexts. For example, due to lack of control over free-ranging wildlife and the stress associated with close human contact, use of a firearm may be the most appropriate means of euthanasia. Also, shooting a suffering animal that is in extremis, instead of catching and transporting it to a clinic to euthanize it using a method normally considered to be appropriate (*e.g.*, barbiturates), is consistent with one interpretation of a good death. The former method promotes the animal's overall interests by ending its misery quickly, even though the latter technique may be considered to be more acceptable under normal conditions (Yeates 2010). Neither of these examples, however, absolves the individual from his or her responsibility to ensure that recommended methods and agents of euthanasia are preferentially used."

AVMA (2013) recognizes that there is "an inherent lack of control over free-ranging wildlife, accepting that firearms may be the most appropriate approach to their euthanasia, and acknowledging that the quickest and most humane means of terminating the life of free-ranging wildlife in a given situation may not always meet all criteria established for euthanasia (*e.g*., distinguishes between euthanasia and methods that are more accurately characterized as humane killing). Because of the variety of situations that may be encountered, it is difficult to strictly classify methods for termination of free-ranging wildlife as acceptable, acceptable with conditions, or unacceptable. Furthermore, classification of a given method as a means of euthanasia or humane killing may vary by circumstances. These acknowledgments are not intended to condone a lower standard for the humane termination of wildlife. The best methods possible under the circumstances must be applied, and new technology and methods demonstrated to be superior to previously used methods must be embraced."

Direct, Indirect, and Cumulative Effects:

The challenge in coping with this issue is how to achieve the least amount of animal suffering with the constraints imposed by current technology. MDM methods viewed by some persons as inhumane would be employed by WS under this alternative. These methods would include shooting, trapping, toxicants/chemicals, and cable restraints. Despite SOPs and state trapping regulations designed to maximize humaneness, the perceived stress and trauma associated with being held in a trap or cable restraint until the WS employee arrives at the capture site to dispatch or release the animal, is unacceptable to some persons. Other MDM methods used to remove target animals including shooting and use of body-gripping traps (*i.e.*, conibear) result in a relatively humane death because the animals die instantly or within seconds to a few minutes. These methods however, are also considered inhumane by some individuals.

WS has improved the selectivity and humaneness of management techniques through research and development. 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 could occur when some MDM methods are used in situations where non-lethal damage management methods are not practical or effective. No indirect or cumulative adverse impacts were identified for this issue.

Alternative 2 - Non-lethal Mammal Damage Management Only by WS

The issues of humaneness of methods under this alternative are likely to be perceived to be similar to humaneness issues discussed under the proposed action. This perceived similarity is derived from WS' recommendation of methods that some consider inhumane. WS 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.

Direct, Indirect, and Cumulative Effects:

WS would instruct and demonstrate the proper use and placement of methodologies to increase effectiveness in capturing target mammal species and to ensure methods are 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 mammals or improperly identifying the damage caused by mammals along with inadequate knowledge and skill in using methodologies to resolve the damage or threat could lead to incidents with a greater probability of

being perceived as inhumane. In those situations, the pain and suffering are likely to be regarded as greater than those discussed in the proposed action.

Alternative 3 - No Mammal Damage Management Conducted by WS

Under this alternative, WS would have no involvement in any aspect of MDM in New York. Those persons experiencing damage or threats associated with mammals could 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 general public since methods are often labeled as inhumane by segments of society no matter the entity employing those methods.

Direct, Indirect, and Cumulative Effects:

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 could 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 general public to use to resolve damage and threats caused by mammals.

3.2 ISSUES NOT CONSIDERD FOR COMPARATIVE ANALYSIS

The following resource values 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 threatened and endangered species recovery plans or labeled as such by USFWS and/or NYSDEC), visual resources, air quality, prime and unique farmlands, aquatic resources, timber, and range. Therefore, these resources were not analyzed.

Additional issues were identified by WS during the scoping process of this EA that were considered but will not receive detailed analyses for the reasons provided. The following issues were considered but will not be analyzed in detail:

Appropriateness of Preparing an EA (Instead of an EIS) for New York State

WS has the discretion to determine the geographic scope of their analyses under the NEPA. The intent in developing this EA is to determine if the proposed action would potentially have significant individual and/or cumulative impacts on the quality of the human environment that would warrant the preparation of an EIS or a FONSI. This EA addresses impacts for managing damage and threats to human safety associated with mammals in New York to analyze individual and cumulative impacts, provide a thorough analysis of other issues relevant to MDM, and provides the public an opportunity to review and comment on the analysis and alternatives.

In terms of considering cumulative effects, one EA analyzing impacts for the entire state will provide a more comprehensive and less redundant analysis than multiple EAs covering smaller areas. As most mammals are regulated by the NYSDEC, the best available data for analysis is often based on statewide population dynamics. For example, an EA on county level may not have sufficient data for that area and have to rely on statewide analysis anyway. If a determination is 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.

WS' Impact on Biodiversity

The WS program does not attempt to eradicate any species of native wildlife. WS operates in accordance with federal and state laws and regulations enacted to ensure species viability. The methods available are employed to target individual mammals or groups of mammals 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. WS operates on a small percentage of the land area of New York and only targets those mammals identified as causing damage or posing a threat. Therefore, mammal damage management activities conducted pursuant to any of the alternatives would not adversely affect biodiversity.

A Loss Threshold Should Be Established Before Allowing Lethal Methods

One issue identified through WS' implementation of 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 can be tolerated by cooperators until it reaches a threshold where damage becomes an economic burden. That tolerance or threshold level before lethal methods are implemented would differ among cooperators and damage situations. In human health and safety situations establishing a threshold would be difficult or inappropriate because human lives and health could be at stake and attributing a cost to human life or health is unethical.

Mammal Damage Management Should Not Occur at Taxpayer Expense

Some individuals may believe that wildlife damage management should not be provided at the expense of the taxpayer or that activities should be fee-based. Funding for MDM activities is derived from federal appropriations and through cooperative funding. Activities conducted for the management of damage and threats to human safety from mammals would be funded through CSAs with individual property owners or associations. A minimal federal appropriation is allotted for the maintenance of the WS program in New York. The remainder of the WS program is mostly fee-based. Technical assistance is provided to requesters as part of the federally-funded activities, but the majority of direct assistance in which WS' employees perform damage management activities is funded through CSAs between the requester and WS.

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 mammals and that prove to be the most cost effective would receive the greatest application. As part of an integrated approach, evaluation of methods would continually occur to allow for those methods that are most effective at resolving damage or threats to be employed under similar circumstance where mammals are causing damage or pose 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 are linked.

Mammal Damage Should Be Managed By Private Nuisance Wildlife Control Agents

Private nuisance wildlife control agents could be contacted to reduce mammal damage for property owners or property managers when deemed appropriate by the resource owner. Some property owners would prefer to use a private nuisance wildlife control agent because the nuisance wildlife agent is located in closer proximity and thus could provide the service at less expense, or because they prefer to use a

private business rather than a government agency. However, some property owners would prefer to enter into an agreement with a government agency. In particular, large industrial businesses, airports, and cities and towns may prefer to use WS because of security and safety issues. The relationship between WS and private industry is addressed in WS Directive 3.101.

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 lethally remove mammals. As described in Appendix B, the lethal removal of mammals with firearms by WS to alleviate damage or threats would occur using a rifle, air 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 lethal removal of mammals by WS using firearms occurs primarily from the use of rifles. However, the use of shotguns could be employed to lethally remove some species. Mammals that are removed using rifles would occur within areas where retrieval of all mammal 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 (WS Directive 2.515) of mammal carcasses will 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 could occur if, during the use of a rifle, the projectile passes through a mammal, if misses occur, or if the mammal carcass is 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 exist that lead from bullets deposited in soil from shooting activities could lead to contamination of water, either ground water or surface water, from runoff. The amount of lead that becomes soluble in soil is usually very small (0.1-2.0%) (USEPA 2005). 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. 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 where it was believed the lead contamination was due to runoff from the parking lot, and not from the shooting range areas. The study also indicated that even when lead shot is highly accumulated in areas with permanent water bodies present, the lead does not necessarily cause elevated lead contamination of water further downstream (Stansley et al. 1992). Ingestion of lead shot, bullets or associated fragments is not considered a significant risk to fish and amphibians (The Wildlife Society 2008).

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). These studies suggest that the very low amounts of lead that could be deposited from damage management activities would have minimal effects on lead levels in soil and water.

Lead ammunition is only one of many sources of lead in the environment, including use of firearms for hunting and target shooting, lost fishing sinkers (an approximated 3,977 metric tons of lead fishing sinkers are sold in the United States annually; The Wildlife Society 2008), and airborne emissions from metals industries (such as lead smelters and iron and steel production), manufacturing industries, and waste incineration that can settle into soil and water (USEPA 2013). Since the lethal removal of mammals can occur during regulated hunting seasons or through the issuance of permits by the NYSDEC, WS' assistance with removing mammals would not be additive to the environmental status

quo since those mammals removed by WS using firearms could be lethally removed by the entities experiencing damage using the same method in the absence of WS' involvement. The amount of lead deposited into the environment may be lowered by WS' involvement in MDM activities. The proficiency training received by WS' employees in firearm use and accuracy increases the likelihood that mammals are lethally removed 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 mammal carcasses lethally removed using firearms would be retrieved and disposed of properly to limit the availability of lead in the environment and ensures mammal carcass are removed from the environment to prevent the ingestion of lead in carcasses by scavengers. Based on current information, the risks associated with lead bullets that are deposited into the environment from WS' activities due to misses, the bullet passing through the carcass, or from mammal carcasses that may be irretrievable would be below any level that would pose any risk from exposure or significant contamination of water.

Effects of Mammal Damage Management Activities on the Regulated Harvest of Mammals

Another issue commonly identified is a concern that mammal damage management activities conducted by WS would affect the opportunity for persons to harvest those species during the regulated hunting and trapping seasons either by reducing local populations through the lethal removal of mammals or by reducing the number of mammals present in an area through dispersal techniques. Those species that are addressed in this EA that also can be hunted or trapped during regulated seasons in New York include: American beaver, bobcat, black bear, coyote, red fox, gray fox, woodchuck, muskrat, Virginia opossum, eastern cottontail, raccoon, striped skunk, eastern gray squirrel, red squirrel, river otter, mink, least weasel, long-tailed weasel, and fisher.

Potential impacts could arise from the use of non-lethal or lethal damage management methods. Non-lethal methods used to reduce or alleviate damage, reduce mammal densities by dispersing animals from areas where damage or the threat of damage is occurring. Similarly, lethal methods used to reduce damage could locally lower target species densities in areas where damage is occurring, resulting in a reduction in the availability of those species during the regulated harvest season. WS' MDM activities would primarily be conducted in areas where hunting access is restricted (*e.g.*, airports, urban areas) or hunting has been ineffective. The use of non-lethal or lethal methods often disperses mammals from areas where damage is occurring to areas outside the damage area which could serve to move those mammal species from those less accessible areas to places more accessible to hunters and trappers. In addition, in appropriate situations, WS commonly recommends recreational hunting and trapping as a damage management alternative for many of the species listed in this EA.

Effects of Beaver Dam Removal on the Status of Wetlands

The issue of WS' potential impacts to wetlands stems from beaver damage management, primarily from the removal of beaver dams through a NYSDEC issued permit (Permit to Take or Harass Nuisance or Destructive Wildlife). Beaver dam removal during activities to manage damage caused by beaver sometimes occurs in areas inundated by water resulting from flooding. Beaver build dams primarily in smaller riverine systems (intermittent and perennial streams and creeks). Dam material usually consists of mud, sticks, and other vegetative material. Their dams obstruct the normal flow of water and can change the preexisting hydrology from flowing or circulating waters to slower, deeper, more expansive waters that accumulate bottom sediment. The depth of the bottom sediment depends on the length of time an area is covered by water and the amount of suspended sediment in the water.

Beaver dams, over time, can establish new wetlands. The regulatory definition of a wetland stated by the USACE and the EPA (40 CFR 232.2) is "Those areas that are inundated or saturated by surface or

groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas."

If a beaver dam is not removed and water is allowed to stand, hydric soils and hydrophytic vegetation eventually form. This process can take anywhere from several months to many years depending on preexisting conditions. Hydric soils are those soils that are saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions. In general, hydric soils form much easier where wetlands have preexisted. Hydrophytic vegetation includes those plants that grow in water or on a substrate that is at least periodically deficient in oxygen because of excessive water content. If those conditions are met, then a wetland has developed that would have different wildlife habitat values than an area that has been more recently impounded by beaver dam activity.

The intent of most dam removal operations is not to drain old established wetlands. With few exceptions, requests received by WS to remove beaver dams have involved the removal of the dam to return an area to the condition that existed before the dam had been built, or before it had been affecting the area for more than a few years. WS' beaver damage management activities are primarily conducted to address damage to agricultural crops, timber resources, public property such as roads and bridges, and water management structures. Beaver dam removal activities would primarily be conducted on small watershed streams, tributary drainages, and ditches. Those activities could be described as small, exclusive projects conducted to restore water flow through previously existing channels.

In the majority of instances, beaver dam removal would be accomplished by manual methods (*i.e.*, hand tools). WS' personnel do not utilize heavy equipment, such as excavators or backhoes, for beaver dam removal. Only the portion of the dam blocking the stream or ditch channel would be breached. In some instances, WS' activities involve the installation of structures to manage water levels at the site of a breached beaver dam.

If the area does not have hydric soils, it usually takes many years for them to develop and a wetland to become established; this often takes greater than five years as indicated by the Swampbuster provision of the Food Security Act. Most beaver dam removal by WS would be allowed under exemptions stated in 33 CFR parts 323 and 330 of Section 404 of the Clean Water Act or parts 3821 and 3822 of the Food Security Act. However, the removal of some beaver dams could trigger certain portions of Section 404 that require landowners to obtain permits in compliance with Articles 15 and 24 from the USACE and NYSDEC prior to removing a blockage. WS' personnel determine the proper course of action upon inspecting a beaver dam impoundment.

3.3 SUMMARY OF IMPACTS

No significant cumulative environmental impacts are expected from any of the three Alternatives. Under the Proposed Action, the lethal removal of mammals by WS would not have significant impacts on overall native mammal populations, but some short-term local reductions may occur. Some efforts to reduce damage caused by non-native species could result in elimination of the species from local areas or the state (*e.g.*, feral swine). 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 MDM 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 MDM activities, and when no WS assistance is provided as in Alternative 3. In all three Alternatives, however, the increase in risk would not be to the point that the impacts would be significant. Although some persons will likely be opposed to WS's participation in MDM activities on

public and private lands, the analysis in this EA indicates that WS Integrated MDM program will not result in significant cumulative adverse impacts on the quality of the human environment.

CHAPTER 4: LIST OF PREPARERS AND PERSONS CONSULTED

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United States Department of the Interior, National Park Service
New York State Department of Environmental Conservation
New York State Parks, Recreation, and Historic Preservation
New York State Department of Agriculture and Markets
New York City Department of Environmental Protection
New York City Department of Parks and Recreation

APPENDIX A: LITERATURE CITED

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APPENDIX B: METHODS AVAILABLE for RESOLVING or PREVENTING MAMMAL DAMAGE in the STATE of NEW YORK

The most effective approach to resolving wildlife damage problems is to integrate the use of several methods, either simultaneously or sequentially. An Integrated Wildlife Damage Management (IWDM) plan would integrate and apply practical methods of prevention and reduce damage by wildlife while minimizing harmful effects of damage reduction measures on humans, other species, and the environment. IWDM 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 is given to the responsible species and the magnitude, geographic extent, duration and frequency, and likelihood of wildlife damage. Consideration is also 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. These factors are evaluated in formulating damage management strategies that incorporate the application of one or more techniques.

A variety of methods are potentially available to the WS program relative to the management or reduction of damage from mammals. Various federal, state, and local statutes and regulations and WS Directives govern WS' use of damage management tools and substances. WS develops and recommends or implements IWDM strategies based on resource management, physical exclusion, and wildlife management approaches. Within each approach there may be available a number of specific methods or tactics. The following methods and materials may be recommended or used in technical assistance and direct damage management efforts of the WS program.

Non-Chemical Mammal 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, etc.) or lethal (*e.g.*, firearms, body gripping traps, cable restraints, etc.). If WS personnel apply these methods on private lands, a Work Initiation Document or 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 which cannot climb from entering areas of protected resources. Fencing, especially if it is installed with an underground skirt, can prevent access to areas for many mammal species which dig, including fox, coyote, and striped skunks. Areas such as airports, yards or hay meadows may be fenced. Hardware cloth or other metal barriers can sometimes be used to prevent girdling and gnawing of valuable trees and to prevent the entry of mammals into buildings through existing holes or gaps. Exclusion and one-way devices such as netting or nylon window screening can be used to exclude bats from a building or an enclosed structure (Greenhall and Frantz 1994). Electric fences of various constructions have been used effectively to reduce damage to various crops by deer, raccoons, and other species (Craven and Hygnstrom 1994, Boggess 1994).

Cultural methods and habitat management includes the application of practices which 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, herders,

shed lambing, carcass removal, or pasture selection. Strategies may also include minimizing cover where damaging mammals might hide, manipulating the surrounding environment through barriers to deter animals from entering a protected area, or planting lure crops on fringes of protected crops. Lure crops/alternate foods are crops planted or other food resources provided to mitigate the potential loss of higher value crops. Removal of trees from around buildings can sometimes reduce damage associated with raccoons.

Some mammals which cause damage in urban environments are attracted to homes by the presence of garbage, pet food or birdseed that is outside and unprotected. Removal or sealing of garbage in tight trash receptacles and elimination of all pet foods from outside areas can reduce the presence of unwanted mammals.

Animal behavior modification refers to tactics that deter or repel damaging mammals and thus, reduce damage to the protected resource. These 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 mammals include:

- electronic guards (siren strobe-light devices)
- propane exploders
- pyrotechnics
- laser lights
- human effigies
- harassment/shooting into groups

Beaver dam removal may be recommended or executed by WS. Dam removal can only be conducted after receiving an Article 24 wetland permit from NYSDEC. Removing beaver dams not only restores natural hydrology, but it also often alleviates the damage associated with flooding, which may impact roads and private property. The specific tools to remove beaver dams may include hand tools, heavy machinery, or binary explosives.

Live capture and relocation can be accomplished through the use of cage traps, species specific traps, live cable restraints, nets, foothold traps, and other methods to capture some species of mammals for the purpose of translocating them for release to wild sites. However, there are exceptions for the relocation of damaging mammals that might be a viable solution, such as when the mammals are considered to have high value such as T&E species. Under the right conditions, relocating wildlife can be a viable and effective wildlife management technique (Craven et al. 1998). WS-NY would only relocate wildlife at the direction of and only after consulting with the USFWS and/or NYSDEC to coordinate capture, transportation, and selection of suitable relocation sites, as well as compliance with all proper guidelines.

Trapping can utilize a number of devices, including footholds, species specific traps, cage-type traps, body gripping (conibear) traps, snaps traps, and glue traps. These techniques are implemented by WS personnel because of the technical training required to use such devices.

Foothold traps can be effectively used to capture a variety of mammals. Foothold traps are either placed beside, or in some situations, in travel ways being actively used by the target species. Placement of traps is contingent upon the habits of the respective target species, habitat conditions, and presence of non-target animals. Effective trap placement and adjustment and the use and placement of appropriate baits and lures by trained WS personnel also contribute to the

foothold trap's selectivity. The animal is captured when downward pressure (activated by the animal's foot) triggers the spring loaded jaws to clamps shut. An additional advantage is that foothold traps can allow for the on-site release of non-target animals. The use of foothold traps requires more skill than some methods, but they are indispensable in resolving many damage problems.

Species specific traps (*e.g.*, Dog-proof traps) can be effectively used specifically to capture raccoons and skunks. Species specific traps are either placed beside travel ways or foraging areas being actively used by the animal. These types of traps require bait to be placed inside the trap and the animal is required to reach in with its paw in an attempt to access the bait resulting in capture.

Cage traps are live capture traps used to trap a variety of small to medium sized mammals. Cage traps come in a variety of sizes and are made of galvanized wire mesh, and consist of a treadle in the middle of the cage that triggers the door to close behind the animal after it enters the trap.

Body-grip traps (*e.g.*, Conibear-type) are designed to cause the quick death of the animal that activates the trap. Placement is at travel corridors or burrow entrances created or used by the target species. The animal is captured as it travels through the trap and activates the triggering mechanism. Safety hazards and risks to humans are usually related to setting, placing, checking, or removing the traps. There is also a small risk to non-target/domestic species. To minimize non-target trapping, precautionary signage is placed at trapping locations to make aware those that pass by and thoughtful trapping placement/techniques are practiced.

Hancock traps (*e.g.*, suitcase/basket-type) are designed to live-capture beaver. This type of trap is constructed of a metal frame covered in chain-link fence that is hinged with springs. Trap appearance is similar to a large suitcase when closed. When set, the trap is opened to allow an animal to enter, and when tripped the sides close around the animal.

Colony traps are multi-catch traps used to either live-capture or drown muskrats. There are various types of colony traps. One common type of colony trap consists of a cylindrical tube of wire mesh with a one-way door on each end (Novak 1987). Colony traps are set at entrances to muskrat burrows or placed in muskrat travel lanes. Colony traps can be used pursuant to NYSDEC's Environmental Conservation Law § 11-0523(6).

Sherman box traps are small live traps used to capture small mammals such as rodents. These traps are often made of galvanized steel or aluminum and fold up for easy transport. Sherman box traps also consist of a treadle towards the back of the trap that triggers the door to close behind the animal being trapped.

Cable restraints are traps made of light cable with a locking device, and are used to catch small and medium sized mammals. The cable is placed in the path of an animal in the form of a loop. When the target species walks into the snare the loop becomes smaller in size, holding the animal as if it were on a leash. When used as a live capture device, cable restraints are equipped with integrated stops that permit snaring, but do not choke the animal and allows non-targets such as white-tailed deer to release itself.

Bow nets are small circular net traps used to live capture raptors and small/medium sized mammals. The nets are hinged and spring loaded so that when the trap is set it resembles a half moon. The net is set over a food source and it triggered by an observer using a pull cord.

Hand nets are used to catch small mammals in confined areas such as homes and businesses. These nets resemble fishing dip nets with the exception that they are larger and have long handles

Catch poles are devices that allow animals to be restrained while keeping them a safe distance away. The device consists of a noose that is usually plastic coated cable at the end of a long pole. The operator of the pole can place the noose over the head and around the neck of an animal and tighten the noose to prevent the animal's escape.

Net guns are devices that project a net over a target animal using a specialized gun.

Snap traps are similar to body-grip traps in that they are designed to cause the quick death of the animal that activates the trap. Placement is along travel corridors or they may be baited. The animal is captured as crosses over the triggering mechanism or while it feeds on the bait. Snap traps are small, designed for mice and rats, and safety hazards and risks to humans are usually low and are related to setting, placing, checking, or removing the traps.

Glue traps also called glue boards or sticky traps are designed to capture mice and rats that cross over them in an extremely sticky glue. Placement is along travel corridors used by the target species. They do not cause a quick death of the animal trapped which generally die from dehydration and may be considered inhumane if they are not checked regularly. Therefore WS would continue to employ the SOPs of checking frequently when setting glue traps. Trapped animals should be humanely euthanized or released (the glue can be deactivated with vegetable oil) immediately after capture.

Shooting is selective for target species and may involve the use of spotlights and either a handgun, shotgun, rifle, or air rifle. Shooting is an effective method to remove a small number of mammals in damage situations, especially where trapping is not feasible. Removal of specific animals in the problem area can sometimes provide immediate relief from a problem. Shooting is sometimes utilized as one of the first lethal damage management options because it offers the potential of resolving a problem more quickly and selectively than some other methods, but it is not always effective. Shooting may sometimes be one of the only damage management options available if other factors preclude setting of damage management equipment. WS personnel receive firearms safety training to use firearms that are necessary for performing their duties. Shooting may also require the use of artificial light, night vision and Forward Looking Infrared equipment when conducted at night.

Cervical dislocation is sometimes used to euthanize small rodents which are captured in live traps and when relocation is not a feasible option. The animal is stretched and the neck is hyper-extended and dorsally twisted to separate the first cervical vertebrae from the skull. When done properly, the AVMA approves this technique as humane method of euthanasia and states that cervical dislocation is a humane technique for euthanasia of small rodents (Beaver et al. 2001). Cervical dislocation is a technique that may induce rapid unconsciousness, does not chemically contaminate tissue, and is rapidly accomplished (Beaver et al. 2001).

Hunting/Trapping is sometimes recommended by WS for resource owners to consider as an option for reducing mammal damage. Although legal hunting/trapping is impractical and/or prohibited in many urban-suburban areas, it can be used to reduce some populations of mammals.

Chemical Mammal Damage Management Methods

All chemicals used by WS are registered by the EPA (under FIFRA) and NYSDEC Division of Materials Management. WS personnel that use restricted-use chemical methods are certified as pesticide

applicators by the Division of Materials Management and are required to adhere to all certification requirements set forth in FIFRA and New York pesticide control laws and regulations and have specific training by WS for MDM pesticide application. Chemicals are only used on private, public, or tribal property sites with authorization from the property owner/manager. Pharmaceutical drugs, including those used in wildlife capture and handling, are administrated by FDA and/or DEA.

No chemicals are 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 mammals.

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 (tiletamine) is another anesthetic used in wildlife capture. It is two-and-a-half to five times more potent than ketamine; therefore, it generally works faster and lasts longer. Currently, tiletamine can only be purchased as Telazol, which is a mixture of two drugs: tiletamine and zolazepam (a tranquilizer). Muscle tension varies with species. Telezol produces extensive muscle tension in dogs, but produces a more relaxed anesthesia in coyotes, wolves, and bears. It is often the drug of choice for these wild species (Fowler and Miller 1999).

BAM is a combination of Butorphanol tartrate, Azaperone tartrate, and Medetomidine hydrochloride used for a broad range of species. BAM provides smooth induction times, as well as quick reversal times. BAM is potent in small volume quantities, which make it effective for immobilizing wildlife remotely by a dart. Animals that are administered BAM have superior muscle relaxation and a good anesthetic plane which facilitates handling and data collection.

Medetomidine (Medetomidine HCI) is an alpha-2 adrenergic agonist with sedative and analgesic properties. Medetomidine calms the animal and provides pain relief. Medetomidine is routinely used in combination with ketamine or tiletamine-zolazepam, and when the combinations are administered produce an animal that is very manageable and in a good state of analgesia. Medetomidine sedative effects can be reversed by yohimbine, tolazoline, or atipamezole.

Atipamezole (Atipamezole HCL) is an alpha-2 antagonist used to reverse the sedative effects of medetomidine and xylazine. Absorption of atipamezole is rapid which produces quick recovery times. Atipamezole typically reverses the sedative effect of medetomidine in 5-10 minutes. Atipamezole is highly selective which minimizes undesirable effects.

Naltrexone (Naltrexone HCL) is an antagonism of any opiate sedation in any species. High doses of naltrexone are an effective tool in reducing or preventing renarcotization. Naltrexone is a pure opioid antagonists, therefore it has a high therapeutic indices.

Tolazoline (Tolazoline HCL) is a combination alpha-1 and alpha-2 antagonist used to reverse the sedative effects of xylazine. Tolazoline works well on white-tailed deer, black-tailed deer, mule deer, moose, and blackbuck antelope. Reversal is quick typically within two minutes.

Yohimbine (Yohimbine HCL) is an alpha-2 antagonist used to reverse the sedative effects of xylazine. Yohimbine quickly reverses the sedative effects of xylazine, typically 2-10 minutes. Additionally, cardiac side effects such as arrhythmia and bradycardia are reverse with yohimbine. Yohimbine is effective on a variety of carnivores and hoofstock, but not cervids.

Sodium pentobarbital with local anesthetic additives combines pentobarbital with another substance to hasten cardiac arrest. Specific drugs in this category include Beuthanasia –D Special® and Euthasol®. Sodium pentobarbital is a barbituric acid derivative, which are generally the preferred method to euthanize animals and work on almost all species and size of animals (Kreeger and Arnemo 2012). Intravenous and intracardiac are the only acceptable routes of injection. As with pure sodium pentobarbital, IC injections 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.

Gas cartridges are incendiary devices composed of carbon and sodium nitrate. When ignited and placed in the target animal's burrow, the resultant carbon monoxide and other gases cause asphyxiation. The only risks to non-target species are risks to rodents and other species found in burrows with the target species. WS will not use gas cartridges in areas where state and federally listed species may be in burrows with the target animal.

Zinc Phosphide is a toxicant used to kill rodents, lagomorphs and nutria. In New York, this pesticide will not be used on species that are protected, including T&E species. It is two to 15 times more toxic to rodents than to carnivores (Hill and Carpenter 1982). Secondary risks appear to be minimal to predators and scavengers that scavenge carcasses of animals killed with zinc phosphide (Hill and Carpenter 1982, Tietjen 1976, Hegdal and Gatz 1977, Hegdal et al. 1980, and Johnson and Fagerstone 1994). This is because: 1) 90% of the zinc phosphide ingested by rodents is detoxified in the digestive tract (Matschke unpubl. as cited in Hegdal et al. 1980), 2) 99% of the zinc phosphide residues occur in the digestive tracts, with none occurring in the muscle, 3) the amount of zinc phosphide required to kill target rodents is not enough to kill most other predatory animals that consume prairie dog tissue (Johnson and Fagerstone 1994).

Use of zinc phosphide on various types of fruit, vegetable, or cereal baits (*e.g.,* apples, carrots, sweet potatoes, oats, and barley) has proven to be effective at suppressing nutria populations. All chemicals used by WS are registered under FIFRA and administered by EPA and the NYSDEC Division of Materials Management. Zinc phosphide is federally registered for use by APHIS/WS. Specific bait applications are designed to minimize non-target hazards (Evans 1970). WS-NY personnel that use chemical methods are certified as pesticide applicators by the Division of Materials Management and are required to adhere to all certification requirements set forth in FIFRA and the New York pesticide control laws and regulations. No chemicals are used on federal or private lands without authorization from the land management agency or property owner/manager.

In addition, zinc phosphide has a strong emetic action (*i.e.,* causes vomiting) and most non-target animals in research tests regurgitated bait or tissues contaminated with zinc phosphide without

succumbing to the toxicant (Hegdal and Gatz 1977, Hegdal et al. 1980, Johnson and Fagerstone 1994). Furthermore, predators tend to eviscerate zinc phosphide-poisoned rodents before eating them or otherwise avoid the digestive tract and generally do not eat the stomach and intestines (Hegdal et al. 1980, Johnson and Fagerstone 1994). Although zinc phosphide baits have a strong, pungent, phosphorous-like odor (garlic like), this characteristic seems to attract rodents, particularly rats, and apparently makes the bait unattractive to some other animals. Many birds appear capable of distinguishing treated from untreated baits and they prefer untreated grain when given a choice (Siefried 1968, Johnson and Fagerstone 1994). Birds appear particularly susceptible to the emetic effects of zinc phosphide, which would tend to offer an extra degree of protection against bird species dying from zinc phosphide grain bait consumption or, for scavenging bird species, from eating poisoned rodents. Use of rolled oats instead of whole grain also appears to reduce bird acceptance of bait. Uresk et al. (1988) reported on the effects of zinc phosphide on 6 non-target rodent populations. They determined that no differences were observed from pretreatment until after treatment in populations of Eastern cottontail rabbits (*Sylvilagus floridanus*) and white-tailed jackrabbits (*Lepus townsendii*). However, primary consumption of bait by non-target wildlife can occur and potentially cause mortality. Uresk et al. (1988) reported a 79% reduction in deer mouse (*Peromyscus maniculatus*) populations in areas treated with zinc phosphide, however the effect was not statistically significant because of high variability in densities and the reduction was not long-term (Deisch et al. 1990).

Ramey et al. (2000) reported that five weeks after treatment, no ring-necked pheasants (*Phasianus colchicus*) had been killed as a result of zinc phosphide baiting. In addition, Hegdal and Gatz (1977) determined that zinc phosphide did not affect non-target populations and more radio-tracked animals were killed by predators than died from zinc phosphide intoxication (Hegdal and Gatz 1977, Ramey et al. 2000). Tietjen (1976) observed horned larks (*Eremophila alpestris*) and mourning doves (*Zenaida macroura*) on zinc phosphide-treated prairie dog colonies, but observations after treatment did not locate any sick or dead birds, a finding similar to Apa et al. (1991). Uresk et al. (1988) reported that ground feeding birds showed no difference in numbers between control and treated sites. Apa et al. (1991) further states that zinc phosphide was not consumed by horned larks because: 1) poison grain remaining for their consumption was low (*i.e.,* bait was accepted by prairie dogs before larks could consume it), 2) birds have an aversion to black-colored foods, and 3) birds have a negative sensory response to zinc phosphide. Reduced impacts on birds have also been reported by Tietjen and Matschke (1982). Deisch et al. (1989) reported on the effect zinc phosphide has on invertebrates. They determined that zinc phosphide bait reduced ant densities, however, spider mites, crickets, wolf spiders, ground beetles, darkling beetles and dung beetles were not affected. Wolf spiders and ground beetles showed increases after one year on zinc phosphide treated areas (Desich 1986). Generally, direct long-term impacts from rodenticide treatments were minimal for the insect populations sampled (Deisch et al. 1989). Long-term effects were not directly related to rodenticides, but more to habitat changes (Deisch 1986) as vegetative cover and prey diversity increased without prairie dogs grazing and clipping the vegetation (Deisch et al. 1989).

Carbon Dioxide (CO_2) is sometimes used to euthanize mammals which are captured in live traps and when relocation is not a feasible option. Live mammals are placed in a sealed chamber. CO_2 gas is released into the chamber and the animal quickly dies after inhaling the gas. This method is approved as a euthanizing agent by the AVMA. CO_2 gas is a byproduct of animal respiration, is common in the atmosphere, and is required by plants for photosynthesis. It is used to carbonate beverages for human consumption and is also the gas released by dry ice. The use of CO_2 by WS for euthanasia purposes is exceedingly minor and inconsequential to the amounts used for other purposes by society.

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 mammals, and are registered for use on only a few species. Repellents are not available for many species which may present damage problems, such as some predators or furbearing species. Repellents are variably effective and depend to a great extent 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.

APPENDIX C: FEDERALLY LISTED THREATENED and ENDANGERED SPECIES

Species	Counties	Habitat Characteristics	Relevant Information	Methods for Resolving Mammal Damage	Determination
Bog Turtle (T) *Clemmys [=Glyptemys] muhlenbergii*	Cayuga, Columbia, Dutchess, Genesee Onondaga, Orange, Oswego, Putnam, Rockland, Sullivan, Ulster, Wayne, Westchester	• Winters in muskrat lodges or in burrows communally with other bog turtles or spotted turtles. • Prefers cool, shallow slow moving water with deep soft muck soils and tussock type vegetation. • Found in emergent and scrub/shrub wetlands such as shallow spring-fed fens, sphagnum bogs, swamps, marshy meadows, and wet pastures.	• Mammal management activities may take place in wetlands. Wildlife Services will consult USFWS iPaC and/or the NYSDEC mapper at to identify locations of turtles. • Management actions in wetlands are typically concluded in a few hours, with minimal disturbance. • Occurrences of working in these habitats are so rare that they are insignificant.	• Audio scaring devices • Shooting • Physical exclusion • Habitat modification • Paintball guns • Recommendation of the use of legal hunting/trapping • Live capture and euthanasia • Visual scaring techniques • Chemical repellents • Lasers • Live traps	• May affect, but not likely to adversely affect
Indiana Bat (E) *Myotis sodalis*	Albany, Cayuga, Columbia, Dutchess Essex, Jefferson, Onondaga, Orange, Oswego, Rockland, Seneca, Ulster, Warren, Westchester	• 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.	• Management activities for mammals are not expected to result in the removal of any trees or occur in any mines or caves.	• Audio scaring devices • Shooting • Physical exclusion • Habitat modification • Paintball guns • Recommendation of the use of legal hunting/trapping • Live capture and euthanasia • Visual scaring techniques • Chemical repellents • Lasers • Live traps	• No effect
Karner Blue Butterfly (E) *Lycaeides melissa samuelis*	Albany, Saratoga, Schenectady, Warren	• Dependent on wild blue 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.	• Management actions for mammals are not expected to occur in uplands or barrens. • Discountable likelihood of activities that may cause impacts intersecting with the known populations.	• Audio scaring devices • Shooting • Physical exclusion • Habitat modification • Paintball guns • Recommendation of the use of legal hunting • Live capture and euthanasia • Visual scaring techniques • Chemical repellents • Lasers • Live traps	• May affect, but not likely to adversely affect

Species	Counties	Habitat Characteristics	Relevant Information	Methods for Resolving Mammal Damage	Determination
Clubshell (E) (mussel) *Pleurobuema clava*	Cattaraugus, Chautauqua	• Prefers clean, loose sand and gravel in medium to small rivers and streams. • Will bury itself in substrate up to 4 inches. • Requires s stable, undisturbed habitat with fish hosts to complete its life stages. • May live up to 50 years.	• Typically, Wildlife Services is on location for a short duration of time (less than an hour) and accesses water via paddle craft. • Wildlife Services personnel are not walking across the bottom of rivers, streams, or creeks in a substantial way. • Wildlife Services will coordinate with USFWS New York Field Office for any projects anticipated to impact this species or their habitat. • Wildlife Services will consult USFWS iPaC and/or the NYSDEC mapper at to identify locations of clubshell.	• Audio scaring devices • Shooting • Physical exclusion • Habitat modification • Paintball guns • Recommendation of the use of legal hunting/trapping • Live capture and euthanasia • Visual scaring techniques • Chemical repellents • Lasers • Live traps	• May affect, but not likely to adversely affect
Rayed Bean (E) (mussel) *Villosa fabalis*	Cattaraugus, Chautauqua	• The rayed bean generally lives in smaller, headwater creeks, but it is sometimes found in large rivers and wave-washed areas of glacial lakes. It prefers gravel or sand substrates, and is often found in and around roots of aquatic vegetation. Adults spend their entire lives partially or completely buried in substrate.	• Typically, Wildlife Services is on location for a short duration of time (less than an hour) and accesses water via paddle craft. • Wildlife Services personnel are not walking across the bottom of rivers, streams, or creaks in a substantial way. • Wildlife Services will coordinate with USFWS New York Field Office for any projects anticipated to impact this species or their habitat. • Wildlife Services will consult USFWS iPaC and/or the NYSDEC mapper at to identify locations of rayed bean.	• Audio scaring devices • Shooting • Physical exclusion • Habitat modification • Paintball guns • Recommendation of the use of legal hunting/trapping • Live capture and euthanasia • Visual scaring techniques • Chemical repellents • Lasers • Live traps	• May affect, but not likely to adversely affect
Houghton's Goldenrod (T) *Solidago houghtonii*	Genesee	• Grows only along the Great Lakes shoreline. It grows primarily along the northern shores of Lakes Michigan and Huron. • Typically grows on moist sandy beaches and shallow depressions between low sand ridges along the shoreline. Fluctuating water levels of the Great Lakes play a role in maintaining this unique goldenrod.	• Wildlife Services will coordinate with U.S. Fish and Wildlife Service New York Field Office for any projects anticipated to impact this species or their habitat. • Wildlife Services will consult USFWS iPaC and/or the NYSDEC mapper at to identify locations of Houghton's goldenrod. • Wildlife Services does not foresee working on federal properties where Houghton's Goldenrod would exist.	• Audio scaring devices • Shooting • Physical exclusion • Habitat modification • Paintball guns • Recommendation of the use of legal hunting/trapping • Live capture and euthanasia • Visual scaring techniques • Chemical repellents • Lasers • Live traps	• May affect, but not likely to adversely affect

Species	Counties	Habitat Characteristics	Relevant Information	Methods for Resolving Mammal Damage	Determination
Northern Wild Monkshood (T) *Aconitum noveboracense*	Delaware, Sullivan, Ulster	• 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.	• Occurrence of working in these habitats would be unlikely and therefore impacts would be insignificant, discountable, and/or beneficial. • Wildlife Services will consult USFWS iPaC and/or the NYSDEC mapper at to identify locations of monkshood.	• Audio scaring devices • Shooting • Physical exclusion • Habitat modification • Paintball guns • Recommendation of the use of legal hunting/trapping • Live capture and euthanasia • Visual scaring techniques • Chemical repellents • Lasers • Live traps	• May affect, but not likely to adversely affect
Dwarf Wedgemussel (E) *Alasmidonta heterodon*	Delaware, Dutchess, Orange, Sullivan	• Habitat consists of sand, firm muddy sand, 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. • Threats to the dwarf wedgemussel include direct habitat destruction from damming and channelizing of rivers, and indirect degradation of habitat due to pollution, sedimentation, invasion by exotic species, and fluctuations in water level or temperature.	• Typically, Wildlife Services is on location for a short duration of time (less than an hour) and accesses water via paddle craft. • Wildlife Services personnel are not walking across the bottom of rivers or creeks in a substantial way. • Wildlife Services will coordinate with U.S. Fish and Wildlife Service New York Field Office for any projects anticipated to impact this species or their habitat. • Wildlife Services will consult USFWS iPaC and/or the NYSDEC mapper at to identify locations of dwarf wedgemussel.	• Audio scaring devices • Shooting • Physical exclusion • Habitat modification • Paintball guns • Recommendation of the use of legal hunting/trapping • Live capture and euthanasia • Visual scaring techniques • Chemical repellents • Lasers • Live traps	• May affect, but not likely to adversely affect
Eastern prairie fringed orchid (T) (Historic) *Plantanthera leucophaea*	This plant is considered extirpated in New York.	• 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.	• This plant is considered extirpated in New York.	• Audio scaring devices • Shooting • Physical exclusion • Habitat modification • Paintball guns • Recommendation of the use of legal hunting/trapping • Live capture and euthanasia • Visual scaring techniques • Chemical repellents • Lasers • Live traps	• No effect

Species	Counties	Habitat Characteristics	Relevant Information	Methods for Resolving Mammal Damage	Determination
Roseate Tern (E) *Sterna dougallii*	Suffolk	• 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.	• Wildlife Services biologists are trained in bird identification and are aware of locations where the species breeds. • Management activities are not expected to occur in habitats occupied by Roseate Tern. Wildlife Services will coordinate with U.S. Fish and Wildlife Service Long Island Field Office for any projects anticipated to impact this species or their habitat prior to implementation. • Wildlife Services will consult USFWS iPaC and/or the NYSDEC mapper at to identify locations of terns.	• Audio scaring devices • Shooting • Physical exclusion • Habitat modification • Paintball guns • Recommendation of the use of legal hunting/trapping • Live capture and euthanasia • Visual scaring techniques • Chemical repellents • Lasers • Live traps	• May affect, but not likely to adversely affect
Piping Plover (T) *Charadrius melodus* (Recognized as endangered in the Great Lakes watershed)	Bronx, Nassau, Queens, Suffolk	• 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.	• Wildlife Services biologists are trained in bird identification and are aware of locations where this species breeds. • Management activities are not expected to occur in habitats occupied by Piping Plover. Wildlife Services will coordinate with U.S. Fish and Wildlife Service Long Island Field Office for any projects anticipated to impact this species or their habitat prior to implementation. • Wildlife Services will consult USFWS iPaC and/or the NYSDEC mapper at to identify locations of plovers. • If management does occur in plover habitat, driving should not take place near potential breeding sites. If driving does occur it should follow the guidelines in Appendix G of the revised piping plover recovery plan.	• Audio scaring devices • Shooting • Physical exclusion • Habitat modification • Paintball guns • Recommendation of the use of legal hunting/trapping • Live capture and euthanasia • Visual scaring techniques • Chemical repellents • Lasers • Live traps	• May affect, but not likely to adversely affect
American hart's-tongue fern (T) *Asplenium scolopendrium var. americana*	Madison, Onondaga	• 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.	• Management activities are not expected to occur in habitats occupied by these plants. • Wildlife Services will consult USFWS iPaC and/or the NYSDEC mapper at to identify locations of ferns.	• Audio scaring devices • Shooting • Physical exclusion • Habitat modification • Paintball guns • Recommendation of the use of legal hunting/trapping • Live capture and euthanasia • Visual scaring techniques • Chemical repellents • Lasers • Live traps	• May affect, but not likely to adversely affect.

Species	Counties	Habitat Characteristics	Relevant Information	Methods for Resolving Mammal Damage	Determination
Chittenango ovate amber snail (T) *Novisuccinea chittenangoensis*	Madison	• Occurs only along a 100 foot high waterfall within Chittenango State Park.	• Management activities will not occur on the vegetated slopes adjacent to the waterfall.	• Audio scaring devices • Shooting • Physical exclusion • Habitat modification • Paintball guns • Recommendation of the use of legal hunting • Live capture and euthanasia/trapping • Visual scaring techniques • Chemical repellents • Lasers • Live traps	• No effect
Sandplain gerardia (E) *Agalinis acuta*	Nassau, Suffolk	• This plant prefers native grasslands on sandy loam soils. It occurs mostly within 10 miles of the coast. • In New York, plants are found along the coastline where it grows on the shifting sands between the dunes and the high tide mark.	• Management activities for mammals could occur on and around sand beaches and dunes. • Wildlife Services will consult USFWS iPaC and/or the NYSDEC mapper at to identify locations of Sandplain gerardia. • Wildlife Services would also contact the USFWS environmental staff for projects within Sandplain gerardia habitat.	• Audio scaring devices • Shooting • Physical exclusion • Habitat modification • Paintball guns • Recommendation of the use of legal hunting/trapping • Live capture and euthanasia • Visual scaring techniques • Chemical repellents • Lasers • Live traps	• May affect, but not likely to adversely affect
Small whorled pogonia (T) *Isotria medeoloides*	Orange	• Small whorled pogonia is found in older hardwood stands of beech, birch, maple, oak, and hickory that have an open understory, or at times in hemlock stands or stands of other soft woods. • Populations are frequently associated with dead wood.	• Management activities will not occur in habitats occupied by small whorled pogonia. • Discountable likelihood of activities that may cause impacts intersecting with low potential for additional locations.	• Audio scaring devices • Shooting • Physical exclusion • Habitat modification • Paintball guns • Recommendation of the use of legal hunting/trapping • Live capture and euthanasia • Visual scaring techniques • Chemical repellents • Lasers • Live traps	• May affect, but not likely to adversely affect

Species	Counties	Habitat Characteristics	Relevant Information	Methods for Resolving Mammal Damage	Determination
Seabeach amaranth (T) *Amaranthus pumilus*	Nassau, Suffolk, Queens	• Plants are found along the coastline where it grows on the shifting sands between the dunes and the high tide mark.	• Wildlife Services does not have a history of conducting work in coastal beach environments, but it is not outside the realm of possibility (i.e. Piping Plover conservation efforts). Wildlife Services will coordinate with U.S. Fish and Wildlife Service Long Island Field Office for any projects anticipated to impact this species or their habitat prior to implementation. • Wildlife Services will consult USFWS iPaC and/or the NYSDEC mapper at to identify locations of seabeach amaranth.	• Audio scaring devices • Shooting • Physical exclusion • Habitat modification • Paintball guns • Recommendation of the use of legal hunting/trapping • Live capture and euthanasia • Visual scaring techniques • Chemical repellents • Lasers • Live traps	• May affect, but not likely to adversely affect
Leedy's roseroot (T) *Rhodiola integrifolia* spp. *leedyi*	Schuyler, Seneca, Yates	• Grows on cool cliffs along the west shore of Seneca Lake. • Prefers areas where cool air from caves comes to cliff surfaces through cracks.	• Management activities are not expected to occur on cliff surfaces.	• Audio scaring devices • Shooting • Physical exclusion • Habitat modification • Paintball guns • Recommendation of the use of legal hunting/trapping • Live capture and euthanasia • Visual scaring techniques • Chemical repellents • Lasers • Live traps	• No effect
Northeastern bulrush (E) *Scirpus ancistrochaetus*	Steuben	• 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.	• Discountable likelihood of activities that may cause impacts intersecting with the known population that is protected in an easement. • Wildlife Services does not anticipate conducting mammal management in forested areas where northeastern bulrush exists.	• Audio scaring devices • Shooting • Physical exclusion • Habitat modification • Paintball guns • Recommendation of the use of legal hunting/trapping • Live capture and euthanasia • Visual scaring techniques • Chemical repellents • Lasers • Live traps	• May affect, but not likely to adversely affect

Species	Counties	Habitat Characteristics	Relevant Information	Methods for Resolving Mammal Damage	Determination
Kemp's [=Atlantic] Ridley Sea Turtle (E) *Lepidochelys kempi*	Currently not believed to occur in New York	• Primarily occupy "neritic" habitats. Neritic zones typically contain muddy or sandy bottoms where prey can be found.	• Management activities for mammals are not expected to occur in habitats used by Kemp's ridley sea turtles.	• Audio scaring devices • Shooting • Physical exclusion • Habitat modification • Paintball guns • Recommendation of the use of legal hunting/trapping • Live capture and euthanasia • Visual scaring techniques • Chemical repellents • Lasers • Live traps	• No effect
Green Sea Turtle (T) *Chelonia mydas*	Currently not believed to occur in New York	• Uses beaches for nesting. • Open ocean convergence zones. • Coastal areas for feeding.	• Management activities for mammals are not expected to occur in habitats used by green sea turtles.	• Audio scaring devices • Shooting • Physical exclusion • Habitat modification • Paintball guns • Recommendation of the use of legal hunting/trapping • Live capture and euthanasia • Visual scaring techniques • Chemical repellents • Lasers • Live traps	• No effect
Hawksbill Sea Turtle (E) *Eretmochelys imbricate*	Kings, Nassau, Queens, Richmond, Suffolk	• Ledges and caves of coral reefs.	• Management activities for mammals are not expected to occur in habitats used by hawksbill sea turtle.	• Audio scaring devices • Shooting • Physical exclusion • Habitat modification • Paintball guns • Recommendation of the use of legal hunting/trapping • Live capture and euthanasia • Visual scaring techniques • Chemical repellents • Lasers • Live traps	• No effect

Species	Counties	Habitat Characteristics	Relevant Information	Methods for Resolving Mammal Damage	Determination
Leatherback Sea Turtle (E) *Dermochelys coriacea*	Kings, Nassau, Queens, Richmond, Suffolk	• Primarily open ocean, but does forage in coastal waters.	• Management activities for mammals are not expected to occur in habitat used by leatherback sea turtles.	• Audio scaring devices • Shooting • Physical exclusion • Habitat modification • Paintball guns • Recommendation of the use of legal hunting/trapping • Live capture and euthanasia • Visual scaring techniques • Chemical repellents • Lasers • Live traps	• No effect
Loggerhead Sea Turtle (T) *Caretta caretta*	Currently not believed to occur in New York	• Nests on beaches. • Forages in coastal waters.	• Management activities for mammals are not expected to occur in habitat used by loggerhead sea turtles.	• Audio scaring devices • Shooting • Physical exclusion • Habitat modification • Paintball guns • Recommendation of the use of legal hunting/trapping • Live capture and euthanasia • Visual scaring techniques • Chemical repellents • Lasers • Live traps	• No effect

Species	Counties	Habitat Characteristics	Relevant Information	Methods for Resolving Mammal Damage	Determination
Eastern massasauga rattlesnake (T) *Sistrurus catenatus catenatus*	Genesee, Onondaga	• Wet prairie, bogs, and swamps. • Marshes and floodplain open areas in wetlands with elevated hummocks for basking.	• Occurrences of working in these habitats would be unlikely and therefore impacts would be insignificant, discountable and/or beneficial. • Wildlife Services will consult USFWS iPaC and/or the NYSDEC mapper to identify locations of eastern massasauga rattlesnakes.	• Audio scaring devices • Shooting • Physical exclusion • Habitat modification • Paintball guns • Recommendation of the use of legal hunting/trapping • Live capture and euthanasia • Visual scaring techniques • Chemical repellents • Lasers • Live traps	• May affect, but not likely to adversely affect
Northern Long-Eared Bat (T) *Myotis septentrionalis*	Albany, Allegany, Bronx, Broome, Cattaraugus, Cayuga, Chautauqua, Chemung, Chenango, Clinton, Columbia, Cortland, Delaware, Dutchess, Erie, Essex, Franklin, Fulton, Genesee, Greene, Hamilton, Herkimer, Jefferson, Kings, 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	• 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.	• Occurrences of working in these habitats would be unlikely; however, work may occur in areas that are adjacent to or in close proximity to habitats used by bats. • Management activities for mammals are not expected to result in the removal of any trees or occur in any mines or caves. • Shooting and audio scaring devices are used almost exclusively at airports and in agricultural settings where habitat is primarily open fields and noise levels are already elevated.	• Audio scaring devices • Shooting • Physical exclusion • Habitat modification • Paintball guns • Recommendation of the use of legal hunting/trapping • Live capture and euthanasia • Visual scaring techniques • Chemical repellents • Lasers • Live traps	• No effect

Species	Counties	Habitat Characteristics	Relevant Information	Methods for Resolving Mammal Damage	Determination
Red Knot (T) *Calidris canutus*	Kings, Nassau, Queens, Suffolk	• 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.	• Discountable likelihood that activity's short duration at any given location will intersect with red knot transient stopovers. • Wildlife Services does not have a history of conducting work in coastal beach environments but it is not outside the realm of possibility (i.e. Piping Plover conservation efforts). Wildlife Services will coordinate with U.S. Fish and Wildlife Service Long Island Field Office for any projects anticipated to impact this species or their habitat prior to implementation.	• Audio scaring devices • Shooting • Physical exclusion • Habitat modification • Paintball guns • Recommendation of the use of legal hunting/trapping • Live capture and euthanasia • Visual scaring techniques • Chemical repellents • Lasers • Live traps	• May affect, but not likely to adversely affect
Swamp Pink (T) (historic) *Helonias bullata*	Currently not believed to occur in New York	• Obligate wetland species. • Occur along seepage areas and streams. • Limited to areas that are perennially saturated but not inundated by floodwater.	• This species is not currently believed to occur in New York so no impacts are expected.	• Audio scaring devices • Shooting • Physical exclusion • Habitat modification • Paintball guns • Recommendation of the use of legal hunting/trapping • Live capture and euthanasia • Visual scaring techniques • Chemical repellents • Lasers • Live traps	• No effect
Rusty Patched Bumble Bee (E) (historic) *Bombus affinis*	Currently not believed to occur in New York	• Grasslands and prairies with undisturbed soils.	• This species is not currently believed to occur in New York so no impacts are expected.	• Audio scaring devices • Nest or egg destruction • Shooting • Physical exclusion • Habitat modification • Paintball guns • Recommendation of the use of legal hunting/trapping • Live capture and euthanasia • Visual scaring techniques • Chemical repellents • Lasers • Overhead wires • Live traps	• No effect

APPENDIX D: STATE LISTED THREATENED and ENDANGERED SPECIES in the STATE of NEW YORK

State Endangered Mollusks

Dwarf Wedgemussel - *Alasmidonta heterodon*

Pink Mucket - *Lampsilis abrupta*

Clubshell - *Pleurobema clava*

Fat Pocketbook - *Potamilus capax*

Rayed Bean - *Villosa fabalis*

Chittenango Ovate Amber Snail - *Novisuccinea chittenangoensis*

State Threatened Mollusks

Brook Floater - *Alasmidonta varicose*

Wavy-rayed Lampmussel - *Lampsilis fasciola*

Green Floater - *Lasmigona subviridis*

State Endangered Insects

Tomah Mayfly - *Siphlonisca aerodromia*

American Burying Beetle - *Siphlonisca aerodromia*

Hessel's Hairstreak - *Callophrys hesseli*

Karner Blue Butterfly - *Lycaeides melissa samuelis*

Regal Fritillary - *Speyeria idalia*

Persius Duskywing - *Erynnis persius*

Grizzled Skipper - *Pyrgus centaureae wyandot*

Arogos Skipper - *Atrytone arogos arogos*

Bog Buckmoth - *Hemileuca sp.*

Pine Pinion Moth - *Lithophane lepida lepida*

State Threatened Insects

Pine Barrens Bluet - *Enallagma recurvatum*

Scarlet Bluet - *Enallagma pictum*

Little Bluet- *Enallagma minisculum*

Northeastern Beach Tiger Beetle - *Cicindela dorsalis dorsalis*

Frosted Elfin - *Callophrys irus*

State Endangered Fishes

Shortnose Sturgeon - *Acipenser brevirostrum*

Silver Chub - *Macrhybopsis storeriana*

Pugnose Shiner - *Notropis anogenus*

Round Whitefish - *Prosopium cylindraceum*

Bluebreast Darter - *Etheostoma camurum*

Gilt Darter - *Percina evides*

Spoonhead Sculpin - *Cottus ricei*

Deepwater Sculpin - *Myoxocephalus thompsoni*

State Threatened Fishes

Lake Sturgeon - *Acipenser fulvescens*

Mooneye - *Hiodon tergisus*

Lake Chubsucker - *Erimyzon sucetta*

Gravel Chub - *Erimystax x-punctata*

Mud Sunfish - *Acantharchus pomotis*

Banded Sunfish - *Enneacanthus obesus*

Longear Sunfish - *Lepomis megalotis*

Longhead Darter - *Percina macrocephala*

Eastern Sand Darter - *Ammocrypta pellucida*

Swamp Darter - *Etheostoma fusiforme*

Spotted Darter - *Etheostoma maculatum*

State Endangered Amphibians

Tiger Salamander - *Ambystoma tigrinum*

Northern Cricket Frog - *Acris crepitans*

State Endangered Reptiles

Mud Turtle - *Kinosternon subrubrum*

Bog Turtle - *Clemmys muhlenbergii*

Atlantic Hawksbill Sea Turtle - *Eretmochelys imbricate*

Atlantic Ridley Sea Turtle - *Lepidochelys kempii*

Leatherback Sea Turtle - *Dermochelys coriacea*

Queen Snake - *Regina septemvittata*

Massasauga - *Sistrurus catenatus*

State Threatened Reptiles

Blanding's Turtle - *Emydoidea blandingii*

Green Sea Turtle - *Chelonia mydas*

Loggerhead Sea Turtle - *Caretta caretta*

Fence Lizard - *Sceloporus undulates*

Timber Rattlesnake - *Crotalus horridus*

State Endangered Birds

Spruce Grouse - *Falcipennis canadensis*

Golden Eagle - *Aquila chrysaetos*

Peregrine Falcon - *Falco peregrinus*

Black Rail - *Laterallus jamaicensis*

Piping Plover - *Charadrius melodus*

Eskimo Curlew - *Numenius borealis*

Roseate Tern - *Sterna dougallii dougallii*

Black Tern - *Chlidonias niger*

Short-eared Owl - *Asio flammeus*

Loggerhead Shrike - *Lanius ludovicianus*

State Threatened Birds

Pied-billed Grebe - *Podilymbus podiceps*

Least Bittern - *Ixobrychus exilis*

Bald Eagle - *Haliaeetus leucocephalus*

Northern Harrier - *Circus cyaneus*

King Rail - *Rallus elegans*

Upland Sandpiper - *Bartramia longicauda*

Common Tern - *Sterna hirundo*

Least Tern - *Sterna antillarum*

Sedge Wren - *Cistothorus platensis*

Henslow's Sparrow - *Ammodramus henslowii*

State Endangered Mammals

Indiana Bat - *Myotis sodalis*

Allegheny Woodrat - *Neotoma magister*

Sperm Whale - *Physeter catodon*

Sei Whale - *Balaenoptera borealis*

Blue Whale - *Balaenoptera musculus*

Finback Whale - *Balaenoptera physalus*

Humpback Whale - *Megaptera novaeangliae*

Right Whale - *Eubalaena glacialis*

Gray Wolf - *Canis lupus*

Cougar - *Felis concolor*

State Threatened Mammals

Canada Lynx - *Lynx canadensis*

Northern Long-eared Bat - *Myotis septentrionalis*

APPENDIX E: STATE of NEW YORK DEPARTMENT of STATE CONCURRENCE LETTER REGARDING COASTAL ZONE RESOURCES

STATE OF NEW YORK
DEPARTMENT OF STATE
ONE COMMERCE PLAZA
99 WASHINGTON AVENUE
ALBANY, NY 12231-0001
WWW.DOS.NY.GOV

ANDREW M. CUOMO
GOVERNOR

ROSSANA ROSADO
SECRETARY OF STATE

October 11, 2017

Allen Gosser
State Director - New York
USDA, APHIS, Wildlife Services
572 Third Avenue Extension, Suite 2
Rensselaer, New York 12144

Re: F-2017-0880(DA)
USDA
Mammal Damage Management in NYS
Negative Determination

Dear Mr. Gosser:

On September 15, 2017, the Department of State received the USDA's negative determination and supporting information for the above referenced activity. Based on the information provided, the Department concurs with your determination that mammal damage management in NYS will not result in any reasonably foreseeable effects to land and water uses or natural resources of the coastal area. Further review of this activity by the Department of State is not necessary.

Thank you for providing this information to the Department of State. If you have any questions regarding this matter, please contact us at (518) 474-6000 and refer to our file # F-2017-0880(DA).

Sincerely,

Jeffrey Zappieri
Supervisor, Consistency Review Unit
Office of Planning, Development and
Community Infrastructure

JZ/mm/dc

NEW YORK STATE OF OPPORTUNITY. | Department of State

APPENDIX F: NYSDEC CONCURRENCE LETTER REGARDING STATE-LISTED THREATENED and ENDANGERED SPECIES

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Fish and Wildlife, Bureau of Wildlife
625 Broadway, 5th Floor, Albany, NY 12233-4754
P: (518) 402-8883 F: (518) 402-8925
www.dec.ny.gov

Mr. Allen Gosser, State Director
USDA, APHIS, Wildlife Services
572 Third Ave. Extension, Suite 2
Rensselaer, NY 12144

November 15, 2017

Dear Director Gosser:

This letter is in response to your September 11, 2017 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 titled *Mammal Damage Management in the State of New York*. With the exceptions outlined in the paragraph below, we concur that the actions outlined in the EA are not anticipated to have adverse impacts to any state-listed threatened or endangered species.

The potential area of concern to state-listed species is when habitat management is recommended. In general, the actions proposed are unlikely to be recommended in areas that may contain listed species. However, without knowing the full geographic scope of the areas that may fall under habitat management recommendations, it is possible that some sites may include habitat occupied by state-listed species. A general provision to review the known locations of listed species (available in the New York State Natural Heritage Program Element Occurrence database) prior to recommending habitat management actions would help address this concern. If any habitat management is proposed within an area known to be used by state-listed species, we recommend contacting the local regional NYSDEC wildlife office for guidance. The Department is happy to work with USDA-APHIS-WS to address any issues that may arise. For example, the species most likely to occur in proximity to developed areas where actions are most likely to be implemented is the northern long-eared bat. In general, the removal of trees greater than 3" dbh may result in adverse impacts to roosting bats. In the event that tree removal is a desired course of action and a review of the database indicates roosting bats may be present, this potential impact can be avoided through the removal of trees during the hibernation period (November 1 – April 1).

For all areas outside of the documented occurrence of state-listed species, we concur that all proposed actions outlined in the EA will have no adverse impacts to listed species. Within areas that are identified as serving as habitat for listed species, we concur that the proposed actions will have no effect when implemented as proposed, when the provisions recommended above for habitat

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

management are incorporated.

Sincerely,

Dan Rosenblatt
Wildlife Diversity Section Head

APPENDIX G: USFWS CONCURRENCE LETTER REGARDING FEDERALLY-LISTED THREATENED and ENDANGERED SPECIES

United States Department of the Interior

FISH AND WILDLIFE SERVICE
3817 Luker Road
Cortland, NY 13045

December 21, 2017

Mr. Allen Gosser
State Director – New York
USDA, APHIS, Wildlife Services
572 Third Avenue Extension, Suite 2
Rensselaer, NY 12144

Dear Mr. Gosser:

This responds to your December 6, 2017, letter regarding the U.S. Department of Agriculture, Animal and Plant Health Inspection Service, Wildlife Services (APHIS) management of mammals (excluding white-tailed deer) causing damage in the State of New York (Program).

As you are aware, Federal agencies have responsibilities under section 7 of the Endangered Species Act (ESA) (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) to consult with the U.S. Fish and Wildlife Service (Service) regarding projects that may affect federally listed species or designated critical habitat, and confer with the Service regarding projects that are likely to jeopardize federally proposed species and/or adversely modify proposed critical habitat. Staff from this office worked with you and your staff to assess potential impacts of activities associated with this Program on all currently federally-listed species and critical habitat in New York. Details and full rationale for the following determination can be found in the table from your December 2017 letter. The APHIS has determined that the Program will result in no effects to the following species under Service jurisdiction:

- Chittenango ovate amber snail (*Novisuccinea chittenangoensis*) (T[1])
- Leedy's roseroot (*Rhodiola integrifolia ssp. leedyi*) (T)
- Indiana bat (*Myotis sodalis*) (E[2])
- Northern long-eared bat (*Myotis septentrionalis*) (T)
- Swamp pink (*Helonias bullata*) (T) (historic)
- Rusty patched bumble bee (*Bombus affinis*) (E) (historic)
- Eastern prairie fringed orchid (*Platanthera leucophaea*) (T) (historic)

We have no further comments on these species.

[1] T = threatened
[2] E = endangered

The APHIS has determined that the Program may affect, but is not likely to adversely affect the following species under Service jurisdiction:

- Bog turtle (*Clemmys [=Glyptemys] muhlenbergii*) (T)
- Piping plover (*Charadrius melodus*) (T/E) or critical habitat
- Red knot (*Calidris canutus rufa*) (T)
- Roseate tern (*Sterna dougallii*) (E)
- Northern wild monkshood (*Aconitum noveboracense*) (T)
- Karner blue butterfly (*Lycaeides melissa samuelis*) (E)
- Clubshell (*Pleurobema clava*) (E)
- Dwarf wedgemussel (*Alasmidonta heterodon*) (E)
- Eastern massasauga rattlesnake (*Sistrurus catenatus catenatus*) (T)
- Houghton's goldenrod (*Solidago houghtonii*) (T)
- Northeastern bulrush (*Scirpus ancistrochaetus*) (E)
- American hart's tongue fern (*Asplenuim scolopendrium* var. *americana*) (T)
- Rayed bean (*Villosa fabalis*) (E)
- Sandplain gerardia (*Agalinus acuta*) (E)
- Seabeach amaranth (*Amaranthus pumilus*) (T)
- Small whorled pogonia (*Isotria medeoloides*) (T)

Given the extremely low likelihood of Program activities occurring when and where these species are likely to be present, we concur with your determinations.

No further coordination or consultation pursuant to the ESA is required with the Service at this time. Should the Program 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. We recommend that you check our website regularly to ensure that listed species presence/absence information for projects associated with the Program is current.*

Any new information regarding the Program 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 coordinating with us. We appreciate the opportunity to review this Program. If you require additional information or assistance please contact Robyn Niver or Noelle Rayman at (607) 753-9334. Future correspondence with us on this Program should reference project file 173358.

Sincerely,

David A. Stilwell

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 (Permits)
USFWS, Long Island, NY