ENVIRONMENTAL ASSESSMENT

REDUCING BIRD DAMAGE

IN THE STATE OF NEW YORK

In cooperation with:

United States Department of the Interior, Fish and Wildlife Service

New York State Department of Environmental Conservation,
Bureau of Wildlife

New York State Office of Parks, Recreation and Historic Preservation

City of New York, Department of Environmental Protection

Port Authority of New York and New Jersey

Prepared by:

UNITED STATES DEPARTMENT OF AGRICULTURE
ANIMAL AND PLANT HEALTH INSPECTION SERVICE
WILDLIFE SERVICES

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Executive Summary

The United States Department of Agriculture, Animal and Plant Health Inspection Service, Wildlife Services (WS) prepared this Environmental Assessment (EA) to facilitate planning, interagency coordination and the streamlining of program management, and to clearly communicate with the public the analysis of individual and cumulative impacts in managing bird damage across the State of New York. The EA describes the need for bird damage management to reduce and prevent damage associated with birds in New York, including damage to property, agriculture, and natural resources, and risks to human health and safety. The proposed bird damage management activities could be conducted on public and private property when the property owner or manager requests assistance and/or when assistance is requested by an appropriate state, federal, tribal or local government agency.

This EA analyzes the potential environmental impacts of three alternatives for WS' response to bird damage. Actions proposed in the EA could be conducted on public and private property when the resource owner (property owner) or manager requests assistance, a need for action is confirmed, and agreements specifying the nature and duration of the bird damage management activities to be conducted are completed. This analysis is prepared in cooperation with the New York State Department of Environmental Conservation; the U.S. Department of the Interior, Fish and Wildlife Service; New York State Office of Parks, Recreation and Historic Preservation; City of New York, Department of Environmental Protection; and the Port Authority of New York and New Jersey.

Alternatives examined in the EA include an alternative in which WS continues the current bird damage management approach (the "no action" alternative and proposed action alternative); an alternative in which WS provides nonlethal bird damage management only; and an alternative in which no bird damage management is conducted by WS. The first alternative, the preferred alternative, evaluates continuation of an integrated bird damage management approach that includes use of the full range of nonlethal and lethal bird damage management techniques (Appendix B). WS would use an Integrated Wildlife Damage Management approach including the WS Decision Model to select and apply these techniques, singly or in combination, to meet requester needs to reduce conflicts with birds. Cooperators requesting assistance would be provided with recommendations and information regarding the use of effective nonlethal and lethal techniques.

Nonlethal methods recommended and used by WS may include resource management, physical exclusion, human behavior modification, habitat modification, repellents, reproductive control, frightening devices, lure crops, trap and translocation, and other deterrents. Lethal methods recommended and used by WS may include the use of shooting, live capture and euthanasia, avicides, the recommendation of permitted hunter harvest during hunting seasons, and nest/egg destruction (see Appendix B for a complete list and description of potential methods). All WS activities would continue to be conducted in accordance with applicable state, federal, and local laws and regulations. The EA provides a detailed analysis of the impacts of each alternative on target bird populations; non-target species including state and federally threatened and endangered species; human health and safety; and the aesthetic value of birds.

An overview of the purpose and need for action related to damage birds could cause to New York's resources are described in Chapter 1. Issues which may affect the implementation of a management approach involving federal resources, as well as detailed descriptions of the specific management alternatives are provided in Chapter 2. Environmental consequences for issues analyzed in detail, including direct, indirect, and cumulative impacts, are provided in Chapter 3.

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ACRONYMS

APHIS	Animal and Plant Health Inspection Service
AVMA	American Veterinary Medical Association
BBS	Breeding Bird Survey
BDM	Bird Damage Management
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
DSNY	New York City Department of Sanitation
EA	Environmental Assessment
ECOFRAM	Ecological Committee on FIFRA Risk Assessment
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FDA	Food and Drug Administration
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FONSI	Finding of No Significant Impact
FY	Fiscal Year
MBTA	Migratory Bird Treaty Act
MOU	Memorandum of Understanding
NAS	National Audubon Society
NASS	National Agricultural Statistics Service
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NPS	National Park Service
NWRC	National Wildlife Research Center
NYCDOC	New York City Department of Correction
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
NYSDOS	New York State Department of State
OPRHP	New York State Office of Parks, Recreation, and Historic Preservation
PANYNJ	Port Authority of New York and New Jersey
SOP	Standard Operating Procedure
T&E	Threatened and Endangered
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, wildlife 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 wildlife, which increases the potential for conflicting human/wildlife interactions. Human/wildlife conflict issues are complicated by the wide range of public responses to wildlife and wildlife damage. What may be unacceptable damage to one person may be a normal cost of living with nature to someone else. Wildlife damage management (WDM) is the science of reducing damage or other problems associated with wildlife and is recognized as an integral part of wildlife management (The Wildlife Society 2010). The relationship in American culture of wildlife values and wildlife 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.*

This Environmental Assessment (EA) evaluates the potential environmental effects of alternatives for WS' involvement in bird damage management (BDM) 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)). WS is a cooperatively funded, service-oriented program that receives requests for assistance with wildlife damage management from private and public entities, including tribes and other governmental agencies. These entities are henceforth known as cooperators. As requested, WS cooperates with land and wildlife management agencies to reduce wildlife damage effectively and efficiently in accordance with applicable federal, state, and local laws and Memoranda of Understanding (MOUs) between WS and other agencies. Federal agencies, including the United States Fish and Wildlife Service (USFWS), recognize the expertise of WS in addressing wildlife damage issues.

WS' activities are conducted to prevent or reduce wildlife damage to agricultural, industrial and natural resources, 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 wildlife damage management (IWDM) approach (WS Directive 2.105[1]) in which a combination of methods may be used or recommended to reduce wildlife damage. Management activities are not based on punishing offending animals but are conducted to reduce damage and risks to human and livestock health and safety, and they are used in conjunction with the WS Decision Model (Slate et al. 1992).

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 and cumulative impacts. This coordination may also allow cooperating agencies to initiate funding mechanisms under grant programs administered by the USFWS. In addition, this EA has been prepared to evaluate and determine if there are any potentially significant or cumulative impacts from the proposed damage management approach.

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 in New York associated with American black duck (*Anas rubripes*), American coot (*Fulica americana*), American golden plover (*Pluvialis dominica*), American goldfinch (*Spinus tristis*),

[1]The WS Policy Manual (https://www.aphis.usda.gov/aphis/ourfocus/wildlifedamage/SA_WS_Program_Directives) provides guidance for WS personnel to conduct wildlife damage management activities through Program Directives. WS Directives referenced in this EA can be found in the manual but will not be referenced in the Literature Cited Appendix.

American kestrel (*Falco sparverius*), American oystercatcher (*Haematopus palliates*), American robin (*Turdus migratorius*), American wigeon (*Anas americana*), American woodcock (*Scolopax minor*), Atlantic brant (*Branta bernicla*), bald eagle (*Haliaeetus leucocephalus*), barn owl (*Tyto alba*), barn swallow (*Hirundo rustica*), barred owl (*Strix varia*), belted kingfisher (*Megaceryle alcyon*), black-bellied plover (*Pluvialis squatarola*), black-crowned night-heron (*Nycticorax nycticorax*), black tern (*Chlidonias niger*), black vulture (*Coragyps atratus*), blue jay (*Cyanocitta cristata*), blue-winged teal (*Anas discors*), boat-tailed grackle (*Quiscalus major*), Boneparte's gull (*Chroicocephalus philadelphia*), brown-headed cowbird (*Molothrus ater*), budgerigar (*Melopsittacus undulates*), bufflehead (*Bucephala albeola*), canvasback (*Aythya valisineria*), caspian tern (*Hydroprogne caspia*), cattle egret (*Bubulcus ibis*), chimney swift (*Chaetura pelagica*), chipping sparrow (*Spizella passerine*), clapper rail (*Rallus crepitans*), cliff swallow (*Petrochelidon pyrrhonota*), common goldeneye (*Bucephala clangula*), common grackle (*Quiscalus quiscula*), common loon (*Gavia immer*), common merganser (*Mergus merganser*), common raven (*Corvus corax*), common tern (*Sterna hirundo*), Cooper's hawk (*Accipiter cooperii*), crow (American or fish) (*Corvus brachyrhynchos* or *Corvus ossifragus*), dark-eye junco (*Junco hyemalis*), double-crested cormorant (*Phalacrocorax auritus*), downy woodpecker (*Picoides pubescens*), dunlin (*Calidris alpine*), eastern kingbird (*Tyrannus tyrannus*), eastern meadowlark (*Sturnella magna*), eastern screech owl (*Megascops asio*), eastern towhee (*Pipilo erythrophthalmus*), eskimo curlew (*Numenius borealis*), European starling (*Sturnus vulgaris*), feral chicken (*Gallus domesticus*), feral waterfowl, field sparrow (*Spizella pusilla*), Forester's tern (*Sterna forsteri*), gadwall (*Mareca strepera*), glossy ibis (*Plegadis falcinellus*), grasshopper sparrow (*Ammodramus savannarum*), gray catbird (*Dumetella carolinensis*), great black-backed gull (*Larus marinus*), great blue heron (*Ardea herodias*), great egret (*Ardea alba*), great horned owl (*Bubo virginianus*), greater scaup (*Aythya marila*), greater snow goose (*Chen caerulescens*), greater yellowleg (*Tringa melanoleuca*), green heron (*Butorides virescens*), green-winged teal (*Anas carolinensis*), gull-billed tern (*Gelochelidon nilotica*), hairy woodpecker (*Leuconotopicus villosus*), Henslow's sparrow (*Ammodramus henslowii*), hermit thrush (*Catharus guttatus*), herring gull (*Larus argentatus*), hooded merganser (*Lophodytes cucullatus*), horned grebe (*Podiceps auritus*), horned lark (*Eremophila alpestris*), house sparrow (*Passer domesticus*), Indian peafowl (*Pavo cristatus*), killdeer (*Charadrius vociferous*), king rail (*Rallus elegans*), Lapland longspur (*Calcarius lapponicus*), laughing gull (*Leucophaeus atricilla*), least bittern (*Ixobrychus exilis*), least sandpiper (*Calidris minutilla*), lesser scaup (*Aythya affinis*), least tern (*Sternula antillarum*), lesser yellowleg (*Tringa flavipes*), loggerhead shrike (*Lanius ludovicianus*), long-eared owl (*Asio otus*), long-tailed duck (*Clangula hyemalis*), mallard (*Anas platyrhynchos*), merlin (*Falco columbarius*), monk parakeet (*Myiopsitta monachus*), mourning dove (*Zenaida macroura*), mute swan (*Cygnus olor*), northern cardinal (*Cardinalis cardinalis*), northern flicker (*Colaptes auratus*), northern goshawk (*Accipiter gentilis*), northern harrier (*Circus hudsonius*), northern mockingbird (*Mimus polyglottos*), northern pintail (*Anas acuta*), northern rough-winged swallow (*Stelgidopteryx serripennis*), northern shoveler (*Anas clypeata*), northern saw-whet owl (*Aegolius acadicus*), osprey (*Pandion haliaetus*), palm warbler (*Setophaga palmarum*), peregrine falcon (*Falco peregrinus*), pied-billed grebe (*Podilymbus podiceps*), pileated woodpecker (*Dryocopus pileatus*), purple martin (*Progne subis*), red-bellied woodpecker (*Melanerpes carolinus*), red-breasted merganser (*Mergus serrator*), redhead (*Aythya americana*), red-headed woodpecker (*Melanerpes erythrocephalus*), red-shouldered hawk (*Buteo lineatus*), red-tailed hawk (*Buteo jamaicensis*), red-throated loon (*Gavia stellate*), red-winged blackbird (*Agelaius phoeniceus*), ring-billed gull (*Larus delawarensis*), ring-necked duck (*Aythya collaris*), ring-necked pheasant (*Phasianus colchicus*), rock pigeon (*Columba livia*), rough-legged hawk (*Buteo lagopus*), royal tern (*Thalasseus maximus*), ruddy duck (*Oxyura jamaicensis*), sanderling (*Calidris alba*), savannah sparrow (*Passerculus sandwichensis*), sedge wren (*Cistothorus platensis*), semipalmated plover (*Charadrius semipalmatus*), semipalmated sandpiper (*Calidris pusilla*), sharp-shinned hawk (*Accipiter striatus*), short-eared owl (*Asio flammeus*), snow bunting (*Plectrophenax nivalis*), snowy egret (*Egretta thula*), snowy owl (*Bubo scandiacus*), song sparrow (*Melospiza melodia*), spotted sandpiper (*Actitis macularius*), spruce grouse (*Falcipennis canadensis*), Swainson's thrush (*Catharus ustulatus*), tree swallow (*Tachycineta bicolor*), turkey vulture (*Cathartes aura*), upland sandpiper (*Bartramia longicauda*), Virginia rail (*Rallus limicola*), whimbrel (*Numenius phaeopus*), white-throated sparrow (*Zonotrichia albicollis*), wild turkey (*Meleagris gallopavo*), willet (*Tringa semipalmata*), wood duck (*Aix sponsa*), yellow-bellied sapsucker (*Sphyrapicus varius*), and yellow-crowned night-heron (*Nyctanassa violacea*), yellow-rumped warbler (*Setophaga coronate*). Canada geese (*Branta canadensis*) are covered in a separate EA (USDA 2017*b*), and are therefore not addressed in this EA.

1.2 NEED FOR ACTION

Some species of wildlife have adapted to and have thrived in human-altered habitats. Those species, in particular, are often responsible for the majority of conflicts between humans and wildlife that lead to requests for assistance to reduce damage to resources and to reduce threats to human safety. This EA evaluates the individual projects conducted by WS in New York to manage damage and threats to agricultural resources, property, natural resources, and threats to humans associated with the bird species listed in this EA.

Both sociological and biological carrying capacities must be applied when resolving 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. 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). Those phenomena are especially important because they define the sensitivity of a person or community to a wildlife species. For any given damage situation, there are varying thresholds of tolerance exhibited by those people directly and indirectly affected by the species and any associated damage. This damage threshold determines the wildlife acceptance capacity. While the habitat might have a biological carrying capacity to support higher populations of wildlife, in many cases, the wildlife acceptance capacity is lower (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, The Wildlife Society 2010, Berryman 1991). The imminent threat of damage or loss of resources is often sufficient for individual actions to be initiated and the need for damage management is derived from the specific threats to resources. Wildlife species have no intent to do harm. They utilize habitats (e.g., feeding, roosting and/or nesting) where they can find a niche. If their activities result in lost economic value of resources or threaten human safety, people characterize this as damage. When damage exceeds or threatens to exceed an economic threshold and/or poses a threat to human safety, people often seek assistance. The threshold triggering a request for assistance is often unique to the individual person requesting assistance and can be based on many factors (e.g., economic, social, aesthetics). Therefore, how damage is defined is often unique to the individual person, and damage occurring to one individual may not be considered damage by another individual. However, the use of the term "*damage*" is consistently used to describe situations where the individual person has determined the loss associated with wildlife is actual damage requiring assistance (i.e., has reached an individual threshold). The term "*damage*" is most often defined as economic losses to resources or threats to human safety, but the term "*damage*" could also include a loss in aesthetic value and other situations where the actions of wildlife are no longer tolerable to an individual person.

Wildlife management is often based on harmonizing wildlife populations and human perceptions, in a struggle to preserve rare species, regulate species populations, oversee consumptive uses of wildlife, and conserve the environment that provides habitat for wildlife resources. Increasingly, cities, towns, parks, airports, and private properties have become sites of some of the greatest challenges for wildlife management (Adams et al. 2006). When the presence of a prolific, adaptable species is combined with human expansion, land management conflicts often develop. Birds are generally regarded as providing ecological, educational, economic, recreational, and aesthetic benefits (Decker and Goff 1987), and there is enjoyment in knowing wildlife exists and contributes to natural ecosystems (Decker and Goff 1987).

Birds add an aesthetic component to the environment, sometimes provide opportunities for recreational hunting and bird watching, and like all wildlife, provide people with valued close contact with nature. Many people, even those people experiencing damage, consider those species of birds addressed in this EA to be a charismatic and valuable component of their environment; however, tolerance differs among individuals. Because of their prolific nature, site tenacity, longevity, size, and tolerance of human activity, many bird species are often associated with situations where damage or threats can occur. For example, free-ranging waterfowl are extremely adaptable and may use the resources provided by humans in urban landscapes for nesting, raising young, molting, feeding, and loafing.

Birds are difficult to manage because they are highly mobile, able to exploit a variety of habitat types within a given area, and cannot be permanently excluded from large areas. It is rarely desirable or possible to remove or disperse all problem birds from an area, but with a proper management scheme, the number of birds and associated problems may be reduced to a level that can be tolerated. Additionally, management of bird-related problems often exceeds the capabilities of individual people to reduce damage to tolerable levels. Problem situations associated with birds typically involve, but are not limited to, unacceptable accumulations of feces in public-use areas, damage to agricultural and natural resources, damage to private property, water contamination, and unacceptable safety hazards (e.g., aircraft striking birds). Those problems frequently occur on private properties, natural/habitat restoration sites, corporate and industrial sites, airports, in residential communities, apartment/condominium complexes, municipal parks, schools, hospitals, office complexes, roadways, and other areas.

The need for action to manage damage and threats associated with birds arises from requests for assistance[2] received by WS and the USFWS to reduce and prevent damage associated with birds from occurring to four major categories. Those four major categories include agricultural resources, natural resources, property, and threats to human health and safety. WS has identified those bird species most likely to be responsible for causing damage to those four categories based on previous requests for assistance and assessments of the threat of bird strike hazards at airports. Table 1.1 lists the number of technical assistance and direct control projects involving bird damage or threats of bird damage by the four major resource types in New York from the federal fiscal year[3] (FY) 2013 through FY 2017. Many of the technical assistance and direct control projects are related to more than one resource type. For example, many projects that are listed as impacting property are also listed as impacting human health and safety. As a reference, there were 33,436 unique work tasks related to birds entered for this five-year time frame. Technical assistance was provided by WS to those persons requesting assistance in order to resolve damage or the threat of damage. WS provided information and recommendations on methods and techniques to reduce damage that could be conducted by the requestor without WS' direct involvement in managing or preventing the damage. Direct control includes damage management activities that are directly conducted by or supervised by personnel of WS. WS' technical assistance and direct control activities will be discussed further in Chapter 2 of this EA.

Many of the bird species addressed in this EA can cause damage to or pose threats to a variety of resources. Most requests for bird damage management assistance received by WS in New York are related to threats to property and human health and safety. Large flocks of birds increase risks of disease transmission and unsafe working conditions from fecal matter being deposited. Bird strikes can also cause substantial damage to aircraft, which could require costly repairs. In some cases, bird strikes can lead to the catastrophic failure of the aircraft, which can threaten passenger and crew safety. Many of the species addressed in this assessment are gregarious (i.e., form large flocks) species especially during the fall and spring migration periods. Although damage and threats can occur throughout the year, damage or the threat of damage is highest during those periods when birds are concentrated into large flocks, such as migration periods and during winter months when food sources are limited. For some bird species, high concentrations of birds can be found during the breeding season where suitable nesting habitat exists. The flocking behavior of many bird species during migration periods can pose increased risks when those species occur near or on airport properties. An aircraft striking multiple birds not only can increase the damage to the aircraft, but also increases the risk that a catastrophic failure of the aircraft might occur, especially if multiple birds are ingested into aircraft engines.

Table 1.1 Number of technical assistance and direct control projects involving bird damage in New York listed by species and broken down into four major resource types from FY 2013 to FY 2017.
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
American black ducks	-	2	348	319	House sparrow	-	-	2057	1411

[2]WS only conducts bird damage management after receiving a request for assistance. Before initiating bird 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.

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

American coot	-	-	5	11	Indian peafowl	1	-	-	-
American crow	6	2	2949	981	Killdeer	-	-	218	232
American goldfinch	-	-	2	2	Laughing gull	-	-	1619	1711
American kestrel (falcon)	-	-	661	682	Least sandpiper	-	-	28	29
American oystercatcher	-	-	56	56	Lesser scaup (duck)	-	1	120	120
American robin	-	-	207	220	Lesser yellowlegs	-	-	14	14
American wigeon (duck)	-	-	14	14	Long-tailed duck	-	-	1	1
American woodcock	-	-	5	5	Mallard (duck)	2	12	1305	1634
Atlantic brant (goose)	-	-	919	-	Merlin (falcon)	-	-	9	9
Bald eagle	1	-	14	14	Monk parakeet	-	-	4	6
Barn swallow	4	3	358	420	Mourning dove	-	-	1887	1885
Belted kingfisher	-	3	9	8	Mute swan	-	165	490	570
Black vulture	3	-	23	8	Nightjars (all)	-	-	1	1
Black-bellied plover	-	-	5	5	Northern cardinal	-	-	2	3
Blackbirds (mixed species)	3	-	936	124	Northern flicker	-	-	19	19
Black-crowned night-heron	-	-	38	37	Northern goshawk	-	-	1	1
Blue jay	-	-	23	22	Northern harrier (hawk)	1	-	71	72
Blue-winged teal (duck)	-	-	3	3	Northern mockingbird	-	-	160	160
Boat-tailed grackle	-	-	18	17	Northern pintail (duck)	-	-	3	4
Bonaparte's gull	1	-	-	1	Northern rough-winged swallow	-	-	1	1
Brown-headed cowbird	1	-	816	826	Northern shoveler (duck)	-	-	42	42
Bufflehead (duck)	-	1	218	219	Osprey	-	3	718	717
Canvasback (duck)	-	-	8	8	Peregrine falcon	-	-	277	277
Cattle egret	-	-	3	3	Pied-billed grebe	-	-	2	2
Cedar waxwing	4	-	-	-	Pileated woodpecker	-	-	8	-
Chipping sparrow	-	-	3	3	Purple martin	-	-	1	1
Cliff swallow	4	3	19	19	Red-bellied woodpecker	-	-	1	-
Common goldeneye (duck)	-	-	1	1	Red-breasted merganser (duck)	-	-	19	19
Common grackle	-	-	230	233	Redhead (duck)	-	-	1	1
Common loon	-	-	2	2	Red-headed woodpecker	-	-	1	-
Common merganser (duck)	1	-	6	6	Red-tailed hawk	1	-	960	1438
Common raven	-	-	566	5	Red-throated loon	-	-	1	1
Common tern	-	-	24	24	Ring-billed gull	1	20	6092	3794
Cooper's hawk	-	-	52	53	Ring-necked duck	-	-	68	69
Dark-eyed junco	-	-	11	11	Ring-necked pheasant	-	-	7	8
Double-crested cormorant	4	19	974	988	Rock pigeon	37	-	4157	3605
Downy woodpecker	-	-	72	-	Rough-legged hawk	-	-	5	5
Eastern kingbird	-	-	22	22	Royal tern	-	-	1	1
Eastern meadowlark	-	-	19	19	Ruddy duck	-	3	128	161
Eastern phoebe	-	-	-	1	Sanderling	-	-	6	6
Eastern towhee	-	-	2	2	Savannah sparrow	-	-	17	19

European starling	339	-	7010	5713	Semipalmated plover	-	-	22	22
Feral chicken	-	-	2	5	Semipalmated sandpiper	-	-	6	6
Feral waterfowl	-	-	1	1	Sharp-shinned hawk	1	-	5	5
Fish crow	-	-	89	89	Snow bunting			28	30
Forster's tern	-	-	2	2	Snowy egret	-	-	16	16
Gadwall (duck)	-	-	47	47	Snowy owl	-	-	199	352
Glossy ibis	-	-	70	70	Song sparrow	-	-	23	23
Grasshopper sparrow	-	-	-	1	Spotted sandpiper	-	-	1	1
Gray catbird	-	-	21	21	Tree swallow	-		35	31
Great black-backed gull	-	7	1818	961	Turkey vulture	2	-	1894	264
Great blue heron	17	6	134	285	Unidentifiable birds	-	-	45	46
Great egret	-	-	65	67	Upland sandpiper	-	-	1	1
Great horned owl	-	5	-	-	Whimbrel	-	-	4	4
Greater scaup (duck)	-	1	12	13	White-breasted nuthatch	-	-	1	1
Greater snow goose	-	-	12	12	White-throated sparrow	-	-	1	1
Green heron	-	-	2	2	Wild turkey	-	-	324	330
Green-winged teal (duck)	-	-	87	86	Willet	-	-	-	33
Gull-billed tern	-	-	2	2	Wood duck	-	-	36	36
Hairy woodpecker	-	-	70	-	Yellow-bellied Sapsucker (woodpecker)	-	-	1	1
Herring gull	-	10	6290	4222	Yellow-crowned night-heron	-	-	10	10
Hooded merganser (duck)	-	-	22	23	Yellow-rumped warbler	-	-	2	2
Horned grebe	-	-	1	1	TOTAL	435	266	49433	38039
Horned lark	-	-	40	41	AVERAGE PER YEAR	87	53	9887	7608

During requests for assistance received by WS, cooperators report or WS verifies (through site visits) damage associated with various species of birds. Between FY 2013 and FY 2017, average yearly bird damage has been reported to WS or has been verified to be $729,405 (see Table 1.2). The majority of reported or verified damages occurred to agricultural resources, which included one case in 2017 of a reported loss of 2,000 acres of corn valued at 1,249,520 due to consumption and/or contamination by blackbirds.

Table 1.2 Reported or WS-verified monetary damage by resource caused by birds in New York.

Resource Type	Year					Total Five Year Damage	Average Yearly Cost of Damage
	2013	2014	2015	2016	2017		
Agriculture	$183,934	$29,838	$572,914	$101,316	$1,461,241	$2,349,243	$469,849
Property	$600,176	$358,950	$137,100	$31,051	$88,517	$1,215,794	$243,159
Natural Resources	$24,340	$800	$500	$50	$100	$25,790	$5,158

Human Health and Safety	$33,800	$0	$22,400	$0	$0	$56,200	$11,240
Total	$842,250	$389,588	$732,914	$132,417	$1,549,858	3,647,027	$729,405

Table 1.2 only reflects damage that has been reported to or verified by WS based on requests received for assistance. Monetary damage for natural resources was not reported or verified by WS; however, assigned monetary damage to natural resources can be difficult, especially when factoring in the lost aesthetic value when natural resources are damaged by birds. Similarly, placing a monetary value on threats to human safety can be difficult. Therefore, these values do not represent the true value of damage caused by birds to these resources. Monetary damage reported in Table 1.2 reflects damage that has occurred and that has been reported to WS, but is not reflective of all bird damage occurring in the state, since not all bird damage or threats are reported to WS in New York. Information regarding bird damage to agricultural resources, property, natural resources, and threats to human safety are discussed in the following subsections of the EA.

Need to Resolve Bird Damage to Agricultural Resources

According to the National Agricultural Statistics Service (NASS), New York had approximately 7.2 million acres of farm land in 2012 with a market value of agricultural products sold estimated at about $54.2 billion (NASS 2014). A total of 41.5% of these sales were in crops and 58.5% were in livestock (NASS 2014). The top grossing crop industries in 2012 included field corn ($620.8 million), soybeans ($171.3 billion), and vegetables, melons, potatoes, and sweet potatoes ($364.1 million) (NASS 2014).

New York is currently ranked number one nationally in yogurt production (NASS 2017), number two in apple production (US Apple Association 2018), and number four in milk production (NASS 2018). Livestock and dairy production contributes substantially to the state's economy with milk production alone valuing at an estimated $3.49 billion in 2014 (NASS 2015). There were an estimated 615,000 milk cows, 115,000 beef cows, 70,000 pigs and hogs, 80,000 sheep and lambs, and 6,509,000 chickens in New York in 2014 (NASS 2015).

A variety of bird species can cause damage to agricultural resources. Damage and threats of damage to agricultural resources is often associated with bird species that exhibit flocking behaviors (e.g., house sparrows, European starlings) or colonial nesting behavior (e.g., pigeons and gulls). Damage occurs through direct consumption of agricultural resources, the contamination of resources from fecal droppings, or the threat of disease transmission to livestock from contact with fecal matter. As shown in Table 1.1, many of the bird species addressed have been identified as causing or posing threats to agricultural resources.

Damage and Threats to Livestock Operations

Damage to livestock operations can occur from several bird species. Economic damage can occur from bird consumption of livestock feed, from birds feeding on livestock, and from the increased risks of disease transmission associated with large concentrations of birds. Although damage and disease threats to livestock operations can occur throughout the year, damage is highest during those periods when birds are concentrated into large flocks, such as migration periods and during winter months when food sources are limited. For some bird species, high concentrations of birds can be found during the breeding season where suitable nesting habitat exists, such as barn swallows. Of primary concern to livestock operations are European starlings and, to a lesser extent, American crows, rock pigeons, and black vultures. Starlings have been reported by cooperators or verified by WS as being responsible for causing approximately $185,882 in loss between FY 2013 and FY 2017 due to contamination and consumption of livestock feed at dairy and feedlot operations throughout New York. American crows were reported as causing $115,346 in damage in 2017.

The flocking behavior of European starlings, house sparrows, and rock pigeons either from feeding, roosting and/or nesting behavior can lead to economic losses to agricultural producers from the consumption of livestock feed. Economic damages associated with starlings and blackbirds feeding on livestock rations has been documented in France and Great

Britain (Feare 1984), and in the United States (Besser et al. 1968, Dolbeer et al. 1978, Glahn and Otis 1981, Glahn 1983, Glahn and Otis 1986). Most recently, Carlson et al. 2017, found that flocks of starlings may consume the high-energy portion of mixed cattle rations on dairy farms, creating the potential to reduce commercial milk production. Starlings damage an estimated $800 million worth of agricultural resources per year across the United States (Pimentel et al. 2000). Diet rations for cattle contain all of the nutrients and fiber that cattle need, and are so thoroughly mixed that cattle are unable to select any single component over others. Livestock feed and rations are often formulated to ensure proper health of the animal. Higher fiber roughage in livestock feed is often supplemented with corn, barley, and other grains to ensure weight gain and in the case of dairies to produce milk. Livestock are unable to select for certain ingredients in livestock feed, while birds often can selectively choose to feed on the corn, barley, and other grains formulated in livestock feed. Livestock feed provided in open troughs is most vulnerable to feeding by birds. Birds often select for those components of feed that are most beneficial to the desired outcome of livestock. When large flocks of birds selectively forage for components in livestock feeds, the composition and the energy value of the feed can be altered, which can negatively affect the health and production of livestock. The removal of this high-energy source by birds, is believed to reduce milk yields, weight gains, and is economically critical (Feare 1984). Glahn and Otis (1986) reported that starling damage was also associated with proximity to roosts, snow, and freezing temperatures and the number of livestock on feed.

Forbes (1995) reported European starlings consumed up to 50% of their body weight in feed each day. Glahn and Otis (1981) reported losses of 4.8 kg of pelletized feed consumed per 1,000 bird per minute. Glahn (1983) reported that 25.8% of farms in Tennessee experienced starling depredation problems of which 6.3% experienced considerable economic loss.

Economic losses can also result from raptors, particularly red-tailed hawks and northern harriers, feeding on domestic fowl such as chickens and waterfowl. Free-ranging fowl or fowl allowed to range outside of confinement for a period are particularly vulnerable to predation by raptors. Additionally, vulture depredation on livestock, including calves, sheep, and farm-raised deer, has been shown to occur throughout the United States. Survey results of a 2014 study showed that 50 of 56 responding counties experienced calf mortality due to vultures in Tennessee (Spires 2014).

Threats of Disease Transmission to Livestock

Large concentrations of birds feeding, roosting, and/or loafing at livestock operations increase risks of disease transmission from fecal matter being deposited in areas where livestock are fed, watered, and housed. Birds feeding in open troughs on livestock feed can leave fecal deposits, which can be consumed by livestock. Fecal matter can also be deposited in sources of water for livestock, which increases the likelihood of disease transmission and can contaminate other surface areas where livestock can encounter fecal matter deposited by birds. Many bird species, especially those encountered at livestock operations, are known to carry infectious pathogens which can be excreted in fecal matter and pose not only a risk to individual livestock operations, but can be a source of transmission to other livestock operations as birds move from one area to another. A number of diseases that could affect livestock have been associated with pigeons, European starlings, blackbirds, and house sparrows and are described in Table 1.3 (Weber 1979).

Table 1.3 Diseases of livestock that have been linked to feral domestic pigeons, domestic gamebirds, European starlings, blackbirds, and/or English sparrows. Information from Weber (1979).

Disease	Livestock affected	Symptoms	Comments
Bacterial:			
Erysipeloid	cattle, swine, horses, sheep, goats, chickens, turkeys, ducks	arthritis, skin lesions, necrosis, septicemia, lameness	serious hazard for the swine industry, rejection of swine meat at slaughter due to septicemia, also affects dogs
Salmonellosis	all domestic animals	abortions, mortality in young, decrease in milk production, colitis	over 1700 serotypes
Pasteurellosis	cattle, swine, horses, rabbits, chickens, turkey	sudden death without illness, pneumonia, mastitis, abortions, septicemia, abscesses	also affects cats and dogs
Avian tuberculosis	chickens, turkeys, swine, cattle, horses, sheep	emaciation, decrease in egg production, death, mastitis	also affects cats and dogs
Streptococcosis	cattle, swine, sheep, horses,	emaciation, death, mastitis, abscesses,	Rock pigeons are susceptible

	chickens, turkeys, geese, ducks, rabbits	inflammation of the heart	and aid in transmission
Yersinosis	cattle, sheep, goats, horses, turkeys, chickens, ducks	abortion	also affects dogs and cats
Vibriosis	cattle and sheep	infertility or early embryonic death, abortion in late pregnancy	of great economic importance
Listeriosis	chickens, ducks, geese, cattle, horses, swine, sheep, goat	difficulty swallowing, nasal discharge, paralysis of throat and facial muscles	also affects cats and dogs
Viral:			
Meningitis	cattle, sheep, swine, poultry	inflammation of the brain, newborns unable to suckle	associated with listeriosis, salmonellosis, cryptococcosis
Encephalitis (7 forms)	horses, turkeys, ducks	drowsiness, inflammation of the brain	mosquitos serve as vectors
Mycotic (fungal):			
Aspergillosis	cattle, chickens, turkeys, and ducks	difficulty breathing, death, abortions	common in turkey poults
Blastomycosis	cattle, sheep, swine	weight loss, fever, cough, bloody sputum and chest pains.	rarely affects horses, dogs, and cats
Candidiasis	cattle, swine, sheep, horses, chickens, turkeys	mastitis, diarrhea, vaginal discharge, aborted fetuses	causes unsatisfactory growth in chickens
Cryptococcosis	cattle, swine, horses	chronic mastitis, decreased milk flow and appetite loss	also affects dogs and cats
Histoplasmosis	horses cattle and swine	chronic cough, loss of appetite, weakness, depression, diarrhea, extreme weight loss	also affects dogs; actively grows and multiplies in soil and remains active long after birds have departed
Coccidiosis	poultry, cattle, and sheep	bloody diarrhea, dehydration, retardation of growth	almost always present in house sparrows; also found in pigeons and European starlings
Protozoal:			
American trypanosomiasis	horses cattle and swine	infection of mucous membranes of eyes or nose, swelling, possible death in 2-4 weeks	caused by the conenose bug found on pigeons
Toxoplasmosis	cattle, swine, horses, sheep, chickens, turkeys	muscular tremors, coughing, sneezing, nasal discharge, frothing at the mouth, prostration, and abortion	also affects dogs and cats
Rickettsial/Chlamydial:			
Chlamydiosis	cattle, horses, swine, sheep, goats, chickens, turkeys, ducks, geese	abortion, arthritis, conjunctivitis, enteritis	also affects dogs and cats and many wild birds and mammals
Q fever	affects cattle, sheep, goats, and poultry	abortion	can be transmitted by infected ticks

Although birds are known to be carriers of pathogens (vectors) that are transmissible to livestock, the rate that transmission occurs is unknown, but is likely to be low. Since many sources of disease transmission exist, identifying a specific source can be difficult. Because birds are known to be vectors of pathogens, the threat of transmission increases when large numbers of birds are defecating and contacting surfaces and areas used by livestock.

Carlson et al. (2011) reported that European starlings have the potential to transmit *salmonella* to livestock through droppings in feed troughs and contaminating drinking water troughs; they found that the probability of *salmonella* contamination of feed and water troughs increased as the presence of starlings increased. Birds also cause damage by defecating on fences, shade canopies, and other structures, which can accelerate corrosion of metal components and can be aesthetically displeasing. Large concentrations of birds at livestock feeding operations can also pose potential health hazards to feedlot/dairy operators and their personnel through directly contacting fecal droppings or by droppings creating unsafe working conditions.

Wild and domestic waterfowl are the acknowledged natural reservoirs for a variety of avian influenza viruses (Davidson and Nettles 1997, Alexander 2000, Stallknecht 2003, Pedersen et al. 2010). Avian influenza typically circulates among

those birds without clinical signs and is not an important mortality factor in wild waterfowl (Davidson and Nettles 1997, Stallknecht 2003, Clark and Hall 2006). However, the potential for avian influenza to produce devastating disease in poultry makes its occurrence in waterfowl an important concern (Davidson and Nettles 1997, USDA 2005*b*, Clark and Hall 2006, Gauthier-Clerc et al. 2007). Between December 2014 and June 2015, several states within the United States experienced a widespread outbreak of highly pathogenic avian influenza among poultry farms (https://www.aphis.usda.gov/aphis/ourfocus/animalhealth/animal-disease-information/avian-influenza-disease/defend-the-flock/2014-2015-hpai-outbreak).

Damage to Agricultural Crops

Besser (1985) estimated damage to agricultural crops associated with birds exceeded $100 million (over $223 million in today's dollar value) annually in the United States. Bird damage to agricultural crops occurs primarily from the consumption of sprouting crops (*i.e*., loss of the crop and revenue), but also consists of trampling of emerging crops by waterfowl, damage to fruits associated with feeding, and fecal contamination. In 2012, the sale of all crops totaled $2.2 billion in New York (NASS 2014). Over the five fiscal years examined, the average amount of monetary damage to all agricultural resources for one year reported or verified by WS in New York State was 475,006.60 (see table 1.2). Waterfowl can graze and trample a variety of crops, including alfalfa, barley, corn, soybeans, wheat, rye, and oats (Cleary 1994). Since 1985, agricultural practices have changed resulting in intensive wheat growing methods with much higher yields of approximately 100 bushels per acre, but these crops are unable to sustain even light grazing pressure without losing yield. Associated costs with agricultural damage involving waterfowl include costs to replant grazed crops, implement nonlethal wildlife management practices, purchase replacement hay, and decreased yields.

Bird damage to sweet corn can also result in economic losses to producers with damage often amplified since even minor damage to sweet corn makes the entire ear of corn unmarketable because damage is unsightly to the consumer (Besser 1985). Large flocks of red-winged blackbirds are responsible for most of the damage reported to sweet corn with damage also occurring from grackles and starlings within the United States (Besser 1985). Damage occurs when birds rip or pull back the husk exposing the ear for consumption. Most bird damage occurs during the development stage known as the milk and dough stage (when the kernels are soft and filled with a milky liquid), which the birds puncture to ingest the contents. Once punctured, the area of the ear damaged often discolors and is susceptible to pathogens introduction into the ear (Besser 1985). Damage usually begins at the tip of the ear as the husk is ripped and pulled back, but can occur anywhere on the ear (Besser 1985).

Damage can also occur to sprouting corn as birds pull out the sprout or dig the sprout up to feed on the seed kernel (Besser 1985). Damage to sprouting corn occurs primarily from crows but red-winged blackbirds, grackles, common ravens, and starlings are known to cause damage to sprouting corn (Mott and Stone 1973, Johnson and Glahn 1994). Damage to sprouting corn is likely localized and highest in areas where breeding colonies exist in close proximity to agricultural fields planted with corn (Mott and Stone 1973, Rogers and Linehan 1977). Rogers and Linehan (1977) found that grackles damaged two corn sprouts per minute on average when present at a field planted near a breeding colony.

Birds have been known to feed upon grapes in vineyards on Long Island and in western New York, reducing crop yield and thereby impacting revenue. New York is the third highest producing state in grapes and the effects that birds can have on vineyard production could potentially be seen nationwide. The destruction that a large flock of birds, such as European starlings, can have on a crop can be seen in a matter of days (Carroll and Weigle 2016).

Need to Resolve Threats that Birds Pose to Human Health and Safety

Several bird species listed in Table 1.1 can be closely associated with human habitation and often exhibit gregarious roosting behavior, such as vultures, waterfowl, crows, starlings, and pigeons. The close association of those bird species with human activity can pose threats to human safety from disease transmission, threaten the safety of air passengers if birds are struck by aircraft, excessive droppings can be aesthetically displeasing, and aggressive behavior, primarily from waterfowl, can pose risks to human safety. Birds have been attributed with $56,200 of monetary damage to human health and safety that was reported to or verified by WS in New York from FY 2013 to FY 2017, which is an average of

$11,240.00 per year. However, it is extremely difficult to place a monetary value on human lives and their safety, and monetary damage numbers relating to human health and safety are difficult to come by.

Threat of Disease Transmission to Humans

Birds can play an important role in the transmission of zoonotic diseases (i.e., animal diseases transmissible to humans) where humans may encounter fecal droppings. As many as 65 different diseases transmittable to humans or domestic animals have been associated with pigeons, European starlings, and house sparrows; the more common zoonotic diseases affecting humans are described in Table 1.4 (Weber 1979). Few studies are available on the occurrence and transmission of zoonotic diseases in wild birds. Study of this issue is complicated by the fact that some disease-causing agents associated with birds may also be contracted from other sources. The risk of disease transmission from birds to humans is likely very low. The presence of disease causing organisms in bird feces is a result of the pathogens being present in the environment in which birds live. Birds likely acquire disease-causing organisms through ingestion of pathogens that originated in the environment. Disease-causing organisms do not originate within birds (i.e., birds do not produce disease-causing organisms), but those birds can act as reservoirs and vectors for disease causing organisms that are of concern to human safety.

Of concern is the ability of birds to obtain disease causing organisms and transport those organisms to other areas, especially to areas with high amounts of human activity. With the ability to fly and move from one location to another, birds can obtain a disease causing organism at one location and transfer the disease causing organism from that location to another location. Human exposure to fecal droppings through contact or through the disturbance of accumulations of fecal droppings where pathogens are known to occur increases the likelihood of disease transmission. Birds can be closely associated with human habitation where interaction with birds or fecal droppings can occur. Many bird species often exhibit gregarious behavior, which can lead to accumulations of fecal droppings in areas where those species forage or loaf. Accumulations of feces can be considered a threat to human health and safety due to the close association of those species of birds with human activity. Accumulations of bird droppings in public areas are aesthetically displeasing and are often found in areas where humans may be exposed.

In most cases in which human health concerns are a major reason for requesting assistance, no actual cases of bird transmission of pathogens to humans have been proven to occur. Thus, the primary reason for requesting assistance is the risk of disease transmission.

The most common strains of avian influenza found in wild birds are low pathogenic strains (Stallknecht 2003, Pedersen et al. 2010), but high pathogenic strains have also been found to exist in wild waterfowl species (Brown et al. 2006, Keawcharoen et al. 2008). Although avian influenza is primarily a disease of birds, there are concerns over the spread of the Asian H5N1 highly pathogenic strain that has shown transmission to humans with potential for mortalities (Gauthier-Clerc et al. 2007, Peiris et al. 2007). Outbreaks of other avian influenza strains have also shown potential to be transmissible to humans during severe outbreaks when people handle infected poultry (Koopmans et al. 2004, Tweed et al. 2004). A pandemic outbreak of avian influenza among birds could have important impacts on human health and economics (World Health Organization 2005, Peiris et al. 2007).

Escherichia coli are fecal coliform bacteria associated with fecal material of warm-blooded animals. There are over 200 specific serological types of *E. coli* with the majority of serological types being harmless (Sterritt and Lester 1988). Probably the best-known serological type of *E. coli* is *E. coli* O157:H7, which can adversely affect human health. This serotype is usually associated with cattle (Gallien and Hartung 1994) but can be moved and transmitted by birds. Many communities monitor drinking water quality for this pathogen, and WS has responded to requests from New York City to manage birds on drinking water reservoirs. Ruddy ducks occasionally inhabit the Hillview Reservoir in Yonkers, and have been known to maintain a seasonal residency. This species has been identified as the most commonly observed duck species throughout the year and has proved to be the most difficult to eliminate using numerous nonlethal techniques. Although the New York City Department of Environmental Protection (NYCDEP) has not been able to detect any direct deterioration in water quality conditions from ducks at Hillview, the presence of ducks may contribute to fecal coliform bacteria and other pathogens in the reservoir through their feces. Because of this risk to human health and safety, WS and the NYCDEP initiated a three-year lethal management project on May 1, 2011 to eliminate the presence of

ruddy ducks from the Hillview Reservoir. WS performed lethal control with shotguns and precision air rifles. During the three-year period, WS sharpshooters successfully removed 82 ruddy ducks and were able to maintain a zero presence of ruddy ducks at the reservoir, excluding the spring and fall migration periods, thereby reducing this risk to human health and safety.

Potential impact on water quality by birds is seasonal in nature and is addressed through integrated damage management discussed in Chapter 2.

Table 1.4 Diseases transmissible to humans that are associated with feral domestic pigeons, European starlings, and house sparrows. Information from Weber (1979).

Disease	Human Symptoms	Potential for Human Fatality
Bacterial:		
Erysipeloid	skin eruption with pain, itching; headaches, chills, joint pain, prostration, fever, vomiting	sometimes - particularly to young children, elderly or immunocompromised people
Salmonellosis	gastroenteritis, septicemia, persistent infection	possible, especially in individuals weakened by other disease or old age
Pasteurellosis	respiratory infection, nasal discharge, conjunctivitis, bronchitis, pneumonia, appendicitis, urinary bladder inflammation, abscessed wound infections	rarely
Listeriosis	conjunctivitis, skin infections, meningitis in newborns, abortions, premature delivery, stillbirth	sometimes - particularly with newborns
Viral:		
Meningitis	inflammation of membranes covering the brain , dizziness, and nervous movements	possible - can also result as a secondary infection with listeriosis, salmonellosis, cryptococcosis
Encephalitis (7 forms)	headache, fever, stiff neck, vomiting, nausea, drowsiness, disorientation	mortality rate for eastern equine encephalitis may be around 60%
Mycotic (fungal):		
Aspergillosis	affects lungs and broken skin, toxins poison blood, nerves, and body cells	rarely
Blastomycosis	weight loss, fever, cough, bloody sputum and chest pains.	rarely
Candidiasis	infection of skin, fingernails, mouth, respiratory system, intestines, and urogenital tract	rarely
Cryptococcosis	lung infection, cough, chest pain, weight loss, fever or dizziness, also causes meningitis	Possible - especially with meningitis
Histoplasmosis	pulmonary or respiratory disease, may affect vision	Possible - especially in infants and young children or if disease disseminates to the blood and bone marrow
Protozoal:		
American trypanosomiasis	infection of mucous membranes of eyes or nose, swelling	possible death in 2-4 weeks
Toxoplasmosis	inflammation of the retina, headaches, fever, drowsiness, pneumonia, strabismus, blindness, hydrocephalus, epilepsy, and deafness	possible
Rickettsial /Chlamydial:		
Chlamydiosis	pneumonia, flu-like respiratory infection, high fever, chills, loss of appetite, cough, severe headaches, generalized aches and pains, vomiting, diarrhea, hepatitis, insomnia, restlessness, low pulse rate	occasionally, restricted to old, weak or those with concurrent diseases
Q fever	sudden pneumonitis, chills, fever, weakness, severe sweating, chest pain, severe headaches and sore eyes	possible

While transmission of pathogens or parasites from birds to humans has not been well documented, the potential exists (Luechtefeld et al. 1980, Wobeser and Brand 1982, Hill and Grimes 1984, Pacha et al. 1988, Blankespoor and Reimink 1991, Graczyk et al. 1997, Saltoun et al. 2000, Kassa et al. 2001). In some cases, infections may even be life threatening, especially for immunocompromised and immunosuppressed people (Roffe 1987, Graczyk et al. 1998). Even though many people are concerned about disease transmission from feces, the probability of contracting a pathogen from feces is believed to be small.

Financial costs related to human health threats involving birds may include testing of water for *coliform* bacteria, cleaning and sanitizing public-use areas, contacting and obtaining assistance from public health officials, and implementing nonlethal and lethal methods of wildlife damage management to reduce risks. WS recognizes and defers to the authority and expertise of local and state officials in determining what does or does not constitute a threat to public health.

Threat of Aircraft Striking Wildlife at Airports and Military Installations

Birds also pose a threat to human safety from being struck by aircraft. Birds struck by aircraft, especially when ingested into engines, can lead to structural damage to the aircraft and can cause catastrophic engine failure. The civil and military aviation communities have acknowledged that the threat to human health and safety from aircraft collisions with wildlife is increasing (Dolbeer 2000, MacKinnon et al. 2004). Collisions between aircraft and wildlife are a concern throughout the world because bird strikes threaten passenger and crew 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 transportation industry as a whole (Conover et al. 1995).

When birds enter or exit a roost in flight lines at or near airports or when present in large flocks foraging on or near an airport, those bird species represent a safety threat to aviation. Generally, bird collisions occur when aircraft are near the ground either taking off or landing (Dolbeer and Wright 2008). During an 18-year period, approximately 60% of reported bird strikes to United States to civil aviation occurred when the aircraft was at an altitude of 100 feet above ground level or less (Dolbeer and Wright 2008). Additionally, 73% occurred less than 500 feet above ground level and about 92% occurred under 3,000 feet above ground level (Dolbeer and Wright 2008). Waterfowl (geese and ducks) were involved in the greatest number of damaging strikes (31%) in which the bird species was identified when compared to all other bird groups (Dolbeer and Wright 2008).

Gulls, raptors, waterfowl, shorebirds, and pigeons/doves are the bird groups most frequently struck by aircraft in the United States (Dolbeer et al. 2015). When struck, 29% of the reported waterfowl strikes resulted in damage, compared to 21% of strikes involving raptors, 21% of the reported gull strikes, 7% of strikes associated with pigeons and doves, and 2% of strikes involving shorebirds (Dolbeer et al. 2015). Since 1990, in the United States, aircraft strikes involving birds have resulted in $631.8 million in reported damages to aircraft and $76.4 million in other monetary losses, including lost revenue, cost of passengers lodged in hotels, re-scheduling flights, and flight cancellations (Dolbeer et al 2015). From 2000 through 2015, over $4.4 million in damage to aircraft has been reported as a results of bird strikes in New York (FAA 2016).

From October 1, 2012 through April 29, 2018 (the most current information available) 3,103 bird strikes were reported by airports in New York. Of the identifiable bird species, the most common strikes were associated with barn swallows (193), American kestrels (170), and mourning doves (116), (FAA Wildlife Strike Database 2018). The number of actual bird strikes is likely to be much greater since an estimated 80% of civil bird strikes may go unreported (Linnell et al. 1999, Cleary et al. 2005, Wright and Dolbeer 2005).

Birds being struck by aircraft can cause substantial damage. Bird strikes can cause catastrophic failure of aircraft systems (e.g., ingesting birds into engines), which can cause the plane to become uncontrollable and can lead to crashes. Injuries also occur from bird strikes to pilots and passengers. In April 2015, an aircraft leaving LaGuardia Airport declared an emergency landing after the aircraft struck a gull, and the flight was subsequently cancelled. On October 24, 2017, an aircraft struck multiple mourning doves along the route to LaGuardia Airport damaging three outer fan blades and 50 inner fan blades in one engine. The engine needed to be replaced and the aircraft was out of service for approximately four days. On November 1, 2017, an aircraft on route to LaGuardia Airport struck a wood duck and the aircraft was subsequently out of service for 23 hours. On November 15, 2017, a military aircraft struck a flock of mourning doves while landing at Schenectady County Airport, and 51 mourning dove carcasses were removed from the runway. On November 27, 2017, an aircraft struck at least three snow geese on approach to JFK Airport, and the aircraft was out of service for 30 hours. The departure flight was cancelled and 260 passengers and crew needed to rebook flights and were provided with hotel accommodations (L. Francoeur, Port Authority, personal communication, 2018).

Additional Human Safety Concerns Associated with Birds

As wildlife species begin to habituate to the presence of people and human activity, a loss of apprehension occurs that can cause those species to exhibit threatening behavior toward people. This threatening behavior continues to increase as human populations expand and the populations of those species that adapt to human activity increase. Threatening behavior can be in the form of aggressive posturing, a general lack of apprehension toward people, or even physical attacking. Although birds attacking people occurs rarely, aggressive behavior by birds does occur, especially during nesting and the rearing of eggs and chicks. Raptors can aggressively defend their nests, nesting areas, and young, and may swoop and strike at pets, children, and adults.

In addition to raptors, waterfowl can also aggressively defend their nests and nestlings during the nesting season and may attack or threaten pets, children, and adults. Feral waterfowl often nest in high densities in areas used by humans for recreational purposes such as industrial areas, parks, beaches, and sports fields. If people unknowingly approach waterfowl or their nests at those locations, injuries could occur if waterfowl react aggressively to the presence of those people.

Additionally, slipping hazards can be created by the buildup of feces from birds on docks, walkways, and other foot traffic areas. WS conducts work at a paper mill in New York that has large numbers of barn swallows and sparrows, as well as many nests from these birds, in the spring and summer time. These birds enter buildings and their feces can cover the docks and the equipment used in paper production. This causes slip hazards, can contaminate or ruin the paper products, and can increase risks to employees from birds exhibiting aggressive behavior when people come close to their nests. To avoid those conditions, WS implements several BDM methods, and regular cleanup is often required to alleviate threats of slipping on fecal matter.

Need to Resolve Bird Damage Occurring to Property

As shown in Table 1.1, some of the bird species addressed in this assessment are known to cause damage to property in New York. Property damage can occur in a variety of ways and can result in costly repairs and clean-up. Bird damage to property occurs through direct damage to structures, through roosting behavior, and through their nesting activities. One example of direct damage to property occurs when vultures tear roofing shingles. Accumulations of fecal droppings can cause damage to buildings and statues. Woodpeckers also cause direct damage to property through excavating holes in buildings, either for nesting purposes or to locate food; this can remove insulation and allows water and other wildlife to enter the building. Aircraft striking birds can also cause substantial damage requiring costly repairs and aircraft downtime. Direct damage can also result from birds that act aggressively toward their reflection in mirrors and windows, which can scratch the glass and surrounding paint and siding.

Birds frequently damage structures on private property and public facilities with fecal contamination. Accumulated bird droppings can reduce the functional life of some building roofs by 50% (Weber 1979). Corrosion damage to metal structures and painted finishes, including those on automobiles, can occur because of uric acid from bird droppings. Electrical utility companies frequently have problems with birds and bird droppings causing power outages by shorting out transformers and substations. This has resulted in hundreds of thousands of dollars of outage time for power companies. In addition to causing power outages noted above, property damage from vultures can include tearing and consuming latex window caulking or rubber gaskets sealing window panes, asphalt and cedar roof shingles, vinyl seat covers from boats, patio furniture, and ATV seats. Vultures and raptors also cause damage to cell phone and radio towers by roosting and nesting on critical tower infrastructure. At JFK airport, rock pigeon and European starling droppings have caused damage to the hangar where 9/11 artifacts are stored. The droppings were eating through the metal and paint of the artifacts and had to be cleaned as 9/11 families were frequently touring the hangar. JFK has also experienced malfunctions in light poles and navigational aids due to ospreys nesting on top of them, which can also pose as a fire hazard.

Damage to property associated with large concentrations of roosting birds occurs primarily from accumulations of droppings and feather debris. Birds that routinely roost and loaf in the same areas often leave large accumulations of droppings and feather debris, which is aesthetically displeasing and can cause damage to property. The recurring presence

of fecal droppings under bird roosts can lead to repeated cleaning costs for property owners. Fecal accumulation from birds roosting at power plants, industrial parks, and ethanol plants can lead to property damage to the facility, as well as become a health hazard for workers. Costs associated with property damage include labor and disinfectants to clean and sanitize fecal droppings, implementation of nonlethal wildlife management methods, loss of property use, and loss of aesthetic value of flowers and gardens.

The attraction of landfills as a food source for gulls and starlings has been well-documented (Patton 1988, Belant et al. 1995, Gabrey 1997, Belant et al. 1998). Large numbers of gulls are attracted to landfills as feeding and loafing areas throughout North America. Landfills have even been suggested as contributing to the increase in gull populations (Verbeek 1977, Patton 1988, Belant and Dolbeer 1993*a*, Belant and Dolbeer 1993*b*, Belant et al. 1993). Gulls that visit landfills may loaf and nest on nearby rooftops, causing health concerns and structural damage to buildings and equipment. Bird conflicts associated with landfills include accumulation of feces on equipment and buildings, distraction of heavy machinery operators, and the potential for birds to transmit pathogens to workers on the site. The tendency for gulls to carry waste off site results in the deposition of garbage on surrounding industrial and residential areas, which creates a nuisance, as well as increases the risks of disease transmission.

Need to Resolve Bird Damage Occurring to Natural Resources

Natural resources may be described as those assets belonging to the public and often managed and held in trust by government agencies as representatives of the people. Such resources may be plants or animals, including threatened and endangered (T&E) species or habitats in general. Examples of natural resources include nesting habitats and native bird species on New York lakes and waterways, parks, forest preserves, wildlife management areas, 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.

An average of $5,158 annually in natural resource damage was reported or verified between FY 2013 and FY2017 in New York; however, assigning a value of damage to natural resources is difficult. Birds can negatively affect natural resources through habitat degradation, competition with other wildlife, and through direct depredation on natural resources.

Habitat degradation occurs when large concentrations of birds in a localized area negatively affect characteristics of the surrounding habitat, which can then adversely affect other wildlife species and become aesthetically displeasing. For example, gulls have been increasing in numbers over recent years, partly due to the reduction of environmental contaminants, increase in availability of anthropogenic food sources, and the ability for gulls to adapt to living in human-altered environments (Belant 1997). These gregarious birds have the ability to form flocks that number in the hundreds, enabling them to cause substantial damage to public lands and residences by defecating in large amounts. Waterfowl and gulls at times cause unsanitary, aesthetically unpleasing fecal accumulations in natural areas, such as state and federal parks and recreational areas. Similarly, cormorant nesting on Lake Champlain islands has resulted in the destruction of vegetation and the displacement of other species of birds (Duerr et al. 2007). Loss of vegetation has caused colony abandonment of colonial waterbirds in other locations where research on co-nesting species has been conducted (Shiedcastle and Martin 1999, Cuthbert et al. 2002). Abandonment of a nesting colony has been documented on Lake Champlain at Four Brothers Islands; cormorant damage to the trees reduced the ideal nesting habitat and caused herons and egrets to relocate (Capen and Bryant 2012).

Competition can occur when two species compete (usually to the detriment of one species) for available resources, such as food or nesting sites. European starlings were first introduced in New York City around 1890 and have since become one of the most abundant birds in the United States, with population estimates around 93 million (Partners in Flight 2019). Starlings will aggressively compete with native birds (such as bluebirds, woodpeckers, and swallows) for nest cavities and food sources. Using Breeding Bird Survey and Christmas Bird Count data, one study showed that starlings had little effects on the population size of 27 cavity-nesting species; however, two species, yellow-bellied sapsuckers and red-cockaded woodpeckers, seemingly suffered from starling competition for nesting sites (Koenig 2003). In addition, another study looked at the competition between starlings and two native woodpeckers in Mississippi, the red-bellied and red-headed woodpecker. Starlings and red-bellied woodpeckers initiate nesting around the same time and this report showed that 52% of red-bellied woodpecker nests were usurped by starlings. Red-headed woodpeckers mostly avoid

initial starling competition by starting the nesting process later and thus showed only 7% of nests being usurped. The pairs of red-bellied woodpeckers that suffered nest cavity losses due to starling competition seemed to also undergo losses in fecundity during that breeding season (Ingold 1989). Ring-billed gulls can compete with other species for nesting spaces. In 2014, 1,400 pairs of common terns nested on the Lake Erie short break wall site. As of 2016, the New York State Department of Environmental Conservation (NYSDEC) estimated that 200 pairs of ring-billed gulls usurped a common tern nesting site. In addition to the direct competition, the gull guano creates a cementing effect on the gravel, which alters the habit and deters common terns as they require loose gravel to build scrape nests. Additionally, nesting colonies of cormorants located on Motor Island are competing with several heron species that utilize critical waterbird nesting habitat (woody island vegetation). In 2008, these sites supported nesting populations of approximately 98 pairs of black-crowned night herons (*Nycticorax nycticorax*), as well as 20 pairs of great egrets (*Ardea alba*), and 61 pairs of great blue heron (*Ardea herodias*). In 2015, black-crowned night heron numbers decreased to 30 nesting pairs.

Direct depredation occurs when predatory bird species feed on other wildlife species, which can negatively influence those species' populations, especially when depredation occurs on threatened and endangered (T&E) species. Great black-backed, herring gulls, crows, and ravens play an important role in the predation of common and roseate terns, which are listed as threatened and endangered, respectively, in New York. These birds will prey upon adults, chicks, and eggs of these terns with one study showing that 23% of common and 6% of roseate tern nests were depredated by gulls during the study period (Donehower et al. 2007). Additionally, avian predators constituted approximately 14% of predation events that led to piping plover nest failure on Assateague Island, Maryland/Virginia (Patterson et al. 1991).

1.3 NATIONAL ENVIRONMENTAL POLICY ACT AND WS DECISION-MAKING

All federal actions are subject to the National Environmental Policy Act (NEPA) (Public Law 9-190, 42 USC 4321 et seq.), including the actions of WS. The WS program follows the Council on Environmental Quality (CEQ) regulations implementing the NEPA (40 CFR 1500 et seq.) along with USDA (7 CFR 1b) and APHIS Implementing Guidelines (7 CFR 372) as part of the decision-making process. The NEPA sets forth the requirement that all 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. In part, the CEQ regulates federal activities affecting the physical and biological environment through regulations in 40 CFR 1500-1508. The NEPA and the CEQ guidelines generally outline five broad types of activities that a federal agency must accomplish as part of projects they conduct. Those five types of activities are public involvement, analysis, documentation, implementation, and monitoring.

Pursuant to the NEPA and the CEQ regulations, WS is preparing this EA to document the analyses associated with proposed federal actions and to inform decision-makers and the public of reasonable alternatives capable of avoiding or minimizing adverse effects.

This EA will serve as a decision-aiding mechanism to ensure that WS infuses the policies and goals of the NEPA and the CEQ into the actions of each agency. This EA will also aid WS with clearly communicating the analysis of individual and cumulative impacts of proposed activities to the public. In addition, the EA will facilitate planning, promote interagency coordination, and streamline program management analyses between WS and its interagency partners. Section 1.6 discusses the roles of each agency. 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.

WS initially developed the issues and alternatives associated with bird damage management in consultation with agency partners. To assist with identifying additional issues and alternatives to managing damage, WS will make this EA available to the public for review and comment prior to the issuance of a Decision (either a Finding of No Significant Impact (FONSI) or a Notice of Intent to prepare and Environmental Impact Statement).

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. Management of migratory birds is the responsibility of the USFWS. As the authority for the overall management of bird populations, the USFWS was involved in the development of the EA and provided 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 of New York, including birds. The NYSDEC establishes and enforces regulations regarding the take and management of wildlife, including the establishment of hunting seasons for some of the bird species addressed in this environmental assessment.

For migratory birds, the NYSDEC can establish hunting seasons for those species under frameworks determined by the USFWS. WS' activities to reduce and/or prevent bird damage would be coordinated with the USFWS and the NYSDEC, which would ensure WS' actions are incorporated into population objectives established by those agencies. The take of many of the bird species addressed in this EA can only occur when authorized by a depredation permit issued by the USFWS and/or the NYSDEC; therefore, the take of those bird species by WS to alleviate damage or reduce threats of damage would only occur at the discretion of those agencies. In addition, WS' annual take of birds to alleviate damage or threats of damage would only occur at levels authorized by those agencies as specified in depredation permits.

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

- How can WS best respond to the need to reduce bird damage in New York?
- Do the alternatives have significant cumulative impacts meriting an Environmental Impact Statement (EIS)?

1.5 SCOPE OF ANALYSIS

The State of New York has approximately four million acres of land available for public use, and these lands are managed by federal, state, and municipal entities (NYSDEC 2010). The rest of the roughly 30 million acres is held within a broad spectrum of private ownership. New York State ranks 27th among states in terms of size, and has the 3rd largest population in the United States (Census Bureau 2014). Bird damage or threats potentially occur statewide. Bird damage management would only be conducted by WS when requested by a landowner or manager and only on properties where a cooperative service agreement or other comparable document has been signed between WS and a cooperating agency, business, organization, or landowner.

Geographical Area and Types of Land Designations and Ownership Included in this EA

Federal, State, County, City, and Private Lands

Under two of the alternatives, WS could continue to provide bird damage management 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 order to reduce damages and threats associated with birds to agricultural resources, natural resources, property, and threats to human safety. The areas of the proposed action include (but are not limited to) property on or adjacent to airports, golf courses, athletic fields, agricultural fields, livestock operations, natural areas, communally–owned homeowner/property owner association properties, recreational areas, swimming beaches, parks, corporate complexes, subdivisions, businesses, industrial parks, military bases, fish hatcheries, government properties and facilities, schools, agricultural areas, landfills, wildlife sanctuaries, wetlands and other water bodies, restoration sites, cemeteries, and reservoirs. In those cases where a federal agency requests WS' assistance with managing damage caused by birds, 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 program in New York would only conduct damage management activities on tribal lands when requested by a Native American tribe. Activities would only be conducted after a MOU or cooperative service agreement had been signed between WS and the tribe requesting assistance. Therefore, the tribe would determine when WS' assistance is 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 birds 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 has been approved by the tribe requesting WS' assistance. Therefore, the activities and methods addressed under the alternatives would include those methods that could be employed on Native American lands, when requested and agreed upon between the tribe and WS.

Affected Environment and Site-Specificity

This EA analyzes the potential impacts of bird damage management based on previous activities conducted on private and public lands in New York where WS and the appropriate entities have entered into a MOU, cooperative service agreement, or other comparable document. This EA also addresses the potential impacts of bird damage management on areas where additional agreements may be signed in the future. It is conceivable that additional damage management efforts could occur while operating within the constraints of available funding and workforce. Thus, this EA anticipates the additional efforts and analyzes the impacts of such efforts as part of the alternatives.

Although some locations where bird damage would occur can be predicted, not all specific locations or times where such damage would occur in any given year can be predicted. In addition, the threshold triggering an entity to request assistance from WS to manage damage associated with birds is often unique to the individual; therefore, predicting where and when such a request for assistance would be received by WS is difficult. Many of the bird species addressed in this EA can be found statewide and throughout the year; therefore, damage or threats of damage can occur wherever those birds occur.

Chapter 2 of this EA identifies and discusses issues relating to bird damage management in New York. The standard WS Decision Model (Slate et al. 1992) would be the site-specific procedure for individual actions conducted by WS (see Chapter 2 for a description of the WS Decision Model and its application). Decisions made using the model would be in accordance with WS' directives[4] 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 the program's mission.

1.6 AUTHORITY AND ROLE OF FEDERAL AND STATE AGENCIES INVOLVED IN THIS EA

USDA APHIS Wildlife Services (WS)

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

[4]WS' Directives can be found at the following web address: https://www.aphis.usda.gov/aphis/ourfocus/wildlifedamage/SA_WS_Program_Directives.

United States Fish and Wildlife Service (USFWS)

The USFWS mission is to conserve, protect, and enhance fish and wildlife along with their habitats for the continuing benefit of the American people. Responsibilities are shared with other federal, state, tribal, and local entities; however, the USFWS has specific responsibilities for the protection of T&E species, migratory birds, inter-jurisdictional fish, and certain marine mammals, as well as for lands and waters that the USFWS administers for the management and protection of those resources. The USFWS also manages lands under the National Wildlife Refuge System.

The USFWS is responsible for managing and regulating take of bird species that are listed as migratory under the Migratory Bird Treaty Act (MBTA) and those that are listed as T&E under the Endangered Species Act (ESA). The take of migratory birds is prohibited by the MBTA. However, the USFWS can issue depredation permits for the take of migratory birds when certain criteria are met pursuant to the MBTA. Depredation permits are issued to take migratory birds to alleviate damage and threats of damage. Under the permitting application process, the USFWS requires applicants to describe prior nonlethal damage management techniques that have been used. In addition, the USFWS can establish orders that allow for the take of those migratory birds addressed in those orders without the need for a depredation permit.

The USFWS authority for migratory bird management is based on the MBTA of 1918 (as amended), which implements treaties with the United States, Great Britain (for Canada), Mexico, Japan, and Russia. Section 3 of this Act authorized the Secretary of Agriculture:

> "From time to time, having due regard to the zones of temperature and distribution, abundance, economic value, breeding habits, and times and lines of migratory flight of such birds, to determine when, to what extent, if at all, and by what means, it is compatible with the terms of the convention to allow hunting, taking, capture, killing, possession, sale, purchase, shipment, transportation, carriage, or export of any such bird, or any part, nest, or egg thereof, and to adopt suitable regulations permitting and governing the same, in accordance with such determinations, which regulations shall become effective when approved by the President."

The authority of the Secretary of Agriculture, with respect to the MBTA, was transferred to the Secretary of the Interior in 1939 pursuant to Reorganization Plan No. II. Section 4(f), 4 FR 2731, 53 Stat. 1433.

Additionally, the 1988 amendment to the Fish and Wildlife Conservation Act mandates the USFWS to "identify species, subspecies, and populations of all migratory nongame birds that, without additional conservation actions, are likely to become candidates for listing under the Endangered Species Act (ESA) of 1973." Birds of Conservation Concern (BCC) 2008 is the most recent effort to carry out this mandate (USFWS 2008). Migratory bird species which are included on the BCC list for the Northeast Region can be found in Table 44 (page 62) of the report, available at: https://www.fws.gov/migratorybirds/pdf/management/BCC2008.pdf.

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 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 for dispersing birds and avicides for use to lethally remove birds.

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 regulates veterinary drugs that may be used to immobilize and/or euthanize birds.

New York State 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 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).

Birds are protected by federal and state laws and regulations. It is illegal to hunt, kill, sell, purchase, or possess migratory birds or their parts, except as permitted by regulations adopted by USFWS and NYSDEC.

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

The OPRHP is a state agency charged with the operation of over 280 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 2014). As of 2019, the OPRHP manages nearly 350,000 acres (142,000 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 State Department of Agriculture and Markets (NYSDAM)

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

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 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, NYCDEP oversees one of the largest capital construction programs in the region. As the agency responsible for NYC's environment, NYCDEP 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 State (NYSDOS)

New York State is required to ensure that federal activities (performed by or on behalf of a federal agency) are consistent with the State's Coastal Management Program. The New York State Department of State (NYSDOS) has been designated as the State's agency that is primarily responsible for assessing if federal agency activities are consistent with the Coastal Management Program.

New York City Department of Sanitation (DSNY)

The NYC Department of Sanitation is the world's largest sanitation department. DSNY collects more than 10,500 tons of residential and institutional garbage and 1,760 tons of the recyclables each day. While efficiently managing solid waste and clearing litter or snow from 6,300 miles of streets, the Department is also a leader in environmentalism, committing to sending zero waste to landfills by 2030. Its mission is to "keep New York City healthy, safe and clean".

New York City Department of Correction (NYCDOC)

The New York City Department of Correction (NYCDOC) is responsible for the custody, care, and control of persons accused of crimes or convicted and sentenced to one year or less of jail time. The Department manages 11 inmate facilities. Eight of those facilities are located on Rikers Island. In addition, the Department operates two hospital Prison Wards (Elmhurst and Bellevue hospitals) and court holding facilities in each borough.

1.7 DOCUMENTS RELATED TO THIS EA

Proposal to Permit Take as Provided Under the Final Programmatic Environmental Impact Statement for the Eagle Rule Revision

Developed by the USFWS, this EIS 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 EIS evaluated the management on an eagle management unit level

(similar to the migratory bird flyways) to establish limits on the amount of eagle take that the USFWS could authorize in order to maintain stable or increasing populations. This alternative further establishes a maximum duration for permits of 30 years with evaluations in five year increments (USFWS 2016). A Record of Decision was made for the preferred alternative in the EIS. The selected alternative revised the permit regulations for the "*take*" of eagles (see 50 CFR 22.26 as amended) and a provision to authorize the removal of eagle nests (see 50 CFR 22.27 as amended). The USFWS published a Final Rule on December 16, 2016 (81 FR 91551-91553).

Bird Hazard Reduction Program: John F. Kennedy International Airport

WS prepared a Supplemental Environmental Impact Statement (SEIS) entitled *Bird Hazard Reduction Program: John F. Kennedy International Airport* (USDA 2012). The SEIS updated and expanded upon the 1994 Final Environmental Impact Statement, *Gull Hazard Reduction Program: John F. Kennedy International Airport*. The SEIS provides information on the nature of the bird strike hazard program at JFK, reviewed six alternatives for reducing bird strikes, and evaluated environmental consequences of each alternative. The current management program at JFK, however, is under a revised evaluation via an Environmental Assessment to determine if a new EIS is warranted.

WS' Environmental Assessments

WS has previously developed EAs that analyzed the need for action to manage damage associated with pigeons, starlings, house sparrows, blackbirds, and crows (USDA 2005), as well as an EA that analyzed the need for action to manage damage associated with ring-billed gulls, herring gulls, great black-backed gulls, and double-crested cormorants (USDA 2003). These EAs identified the issues and analyzed alternative approaches to meet the specific needs identified in these documents. Since activities conducted under the previous EAs will be re-evaluated under this EA to address the current need for action (as described in section 1.2) and the associated affected environment, the previous EAs that addressed birds will be superseded by this analysis and the outcome of the Decision issued.

Mute Swans in New York: A Final Management Plan to Prevent Population Growth and Minimize Impacts of a Non-Native Invasive Species

In January of 2019, the NYSDEC adopted a management plan for mute swans entitled: *Mute Swans in New York: A Final Management Plan to Prevent Population Growth and Minimize Impacts of an Invasive Species*. This plan outlines a regional approach to contain and minimize the impacts of mute swans in the state with an emphasis on nonlethal control measures statewide. The plan contains three parts: the first focusing on education and outreach, the second focuses on responsible possession and care of mute swans, and the third involves the management of mute swans across the state (NYSDEC 2019).

1.8 SUMMARY OF PUBLIC INVOLVEMENT

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

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

1.9 RATIONALE FOR PREPARING AN EA RATHER THAN AN EIS

Wildlife damage management falls within the category of federal or other regulatory agency actions in which the exact timing or location of individual activities cannot usually be predicted well enough ahead of time to accurately describe such locations or times in an EA or EIS. Although WS can predict some of the possible locations or types of situations and sites where some kinds of wildlife damage would occur, WS cannot predict the specific locations or times at which affected resource owners would determine a damage problem has become intolerable to the point that they request assistance from WS. 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 finding of no significant impact (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.

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 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 would occur in the absence of the federal action. This concept is applicable to situations involving federal assistance in managing damage associated with resident wildlife species managed by the state natural resources agency, invasive species, or unprotected wildlife species.

Most native wildlife species are protected under state or federal law. For some bird species, harvest during the hunting season is regulated pursuant to the MBTA by the USFWS through the issuance of frameworks that include the allowable length of hunting seasons, methods of removal, and allowed harvest, which are implemented by the NYSDEC. Under the blackbird depredation order (50 CFR 21.43), blackbirds can be removed by any entity without a depredation permit when those species identified in the order are found committing or about to commit damage or posing a human safety threat. Pursuant to the MBTA, the USFWS can issue depredation permits to those entities experiencing damage associated with birds, when deemed appropriate. Free-ranging or feral domestic waterfowl, European starlings, rock pigeons, mute swans, ring-necked pheasants, wild turkeys, monk parakeets, Eurasian collared-doves, and house sparrows are not protected from removal under the MBTA and can be addressed without the need for a depredation permit from the USFWS.

When a non-federal entity (e.g., agricultural producers, health agencies, municipalities, counties, private companies, individuals) takes an action to alleviate bird damage, the action is typically not subject to compliance with the NEPA due to the lack of federal involvement[5] 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 birds should occur and even the particular methods that would be used, WS' involvement in the action would not affect the environmental status quo. WS' involvement would not change the environmental status quo if the requestor had conducted the action in the absence of WS' involvement in the action.

1.10 COMPLIANCE WITH LAWS AND STATUTES

Several laws or statutes authorize, regulate, or otherwise would affect WS' activities under the alternatives. WS complies with all applicable federal, state, and local laws and regulations in accordance with WS Directive 2.210. Those laws and regulations relevant to managing bird damage in the state are addressed below:

[5]If a federal permit is required to conduct damage management activities, the issuing federal agency would be responsible for compliance with the NEPA for issuing the permit.

Migratory Bird Treaty Act of 1918 (MBTA) (16 USC 703-711; 40 Stat. 755), as amended

The MBTA makes it unlawful to pursue, hunt, take, capture, kill, possess, import, export, transport, sell, purchase, barter, or offer for sale, purchase, or barter, any migratory bird, or their parts, nests, or eggs (16 USC 703-711). A list of bird species protected under the MBTA can be found in 50 CFR 10.13.

The MBTA also provides the USFWS regulatory authority to protect families of migratory birds. The law prohibits any "*take*" of migratory bird species by any entities, except as permitted by the USFWS. Under permitting guidelines in the Act, the USFWS may issue depredation permits to requesters experiencing damage caused by bird species protected under the Act. Information regarding migratory bird permits can be found in 50 CFR 13 and 50 CFR 21. All actions analyzed in this EA would be conducted in compliance with the regulations of the MBTA, as amended.

The law was further clarified to include only those birds afforded protection from take in the United States by the Migratory Bird Treaty Reform Act of 2004. Under the Reform Act, the USFWS published a list of bird species not protected under the MBTA (70 FR 12710-12716). Non-native bird species, such as free-ranging or feral domestic waterfowl, mute swans, ring-necked pheasants, monk parakeets, rock pigeons, Eurasian collared-doves, European starlings, and house sparrows are not protected from take under the MBTA. A permit from the USFWS to take those species is not required.

In addition to the issuance of depredation permits for the take of migratory birds, the Act allows for the establishment of depredation orders that allow migratory birds to be taken without a depredation permit when certain criteria are met.

Depredation Order for Blackbirds, Cowbirds, Grackles, Crows, and Magpies (50 CFR 21.43)

Pursuant to the MBTA under 50 CFR 21.43, a depredation permit is not required to lethally take blackbirds when those species are found committing or about to commit depredations upon ornamental or shade trees, agricultural crops, livestock, or wildlife, or when concentrated in such numbers and manner as to constitute a health hazard or other nuisance (Sobeck 2010). Those bird species that can be lethally taken under the blackbird depredation order that are addressed in the assessment include American crows, fish crows, red-winged blackbirds, yellow-headed blackbirds, common grackles, boat-tailed grackles, and brown-headed cowbirds.

Control Order for Muscovy Ducks (50 CFR 21.54)

Muscovy ducks are native to South America, Central America, and Mexico with a small naturally occurring population in southern Texas. Muscovy ducks have also been domesticated and have been sold and kept for food and as pets in the United States. In many states, Muscovy ducks have been released or escaped captivity and have formed feral populations, especially in urban areas, that are non-migratory. The USFWS has issued a Final Rule on the status of the Muscovy duck in the United States (75 FR 9316-9322). Since naturally occurring populations of Muscovy ducks are known to inhabit parts of south Texas, the USFWS has included the Muscovy duck on the list of bird species afforded protection under the MBTA at 50 CFR 10.13 (75 FR 9316-9322). To address damage and threats of damage associated with Muscovy ducks, the USFWS has also established a control order for Muscovy ducks under 50 CFR 21.54 (75 FR 9316-9322). Under 50 CFR 21.54, Muscovy ducks, and their nests and eggs, may be removed or destroyed without a depredation permit from the USFWS at any time in the United States, except in Hidalgo, Starr, and Zapata Counties in Texas (75 FR 9316-9322).

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 Endangered Species Act (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 bald 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 81 FR 91551-91553, 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.

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 as necessary 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 of 1966, and its implementing regulations (see 36 CFR 800), requires federal agencies to: 1) determine whether activities they propose constitute "undertakings" that have the potential to cause effects on historic properties and, 2) if so, to evaluate the effects of such undertakings on historic resources and consult with the Advisory Council on Historic Preservation, as appropriate. Actions on tribal lands are only conducted at the tribe's request and under signed agreement; thus, the tribes have control over any potential conflict with cultural resources on tribal properties.

Each method described in this EA that might be used operationally by WS does not cause major ground disturbance, does not cause any physical destruction or damage to property, does not cause any alterations of property, wildlife habitat, or landscapes, and does not involve 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 proposed action 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, then site-specific consultation as required by Section 106 of the NHPA would be conducted as necessary.

There is potential for audible effects on the use and enjoyment of a historic property when methods such as pyrotechnics, firearms, and other noise producing methods are used at or in close proximity to such sites for purposes of resolving damage caused by birds. 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 or nuisance problem, which means such uses would be to the benefit the historic property. A built-in mitigating factor for this issue is that virtually all of 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 Section 106 of the NHPA would be conducted as necessary in those types of situations.

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

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

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

Children may suffer disproportionately for many reasons from environmental health and safety risks, including the development of their physical and mental status. WS and cooperating agencies makes it a high priority to identify and assess environmental health and safety risks that may disproportionately affect children. WS and cooperating agencies have considered the impacts that this proposal might have on children. The proposed activities would occur by using only legally available and approved methods where it is highly unlikely that children would be adversely affected. For these reasons, WS concludes that it would not create an environmental health or safety risk to children from implementing this proposed action

Responsibilities of Federal Agencies to Protect Migratory Birds - Executive Order 13186

Migratory birds are of great ecological and economic value to this country and to other countries. They contribute to biological diversity and bring tremendous enjoyment to millions of Americans who study, watch, feed, or hunt these birds throughout the United States and other countries. The United States has recognized the critical importance of this shared resource by ratifying international, bilateral conventions for the conservation of migratory birds. Such conventions include the Convention for the Protection of Migratory Birds with Great Britain on behalf of Canada in 1916; the Convention for the Protection of Migratory Birds and Game Mammals with Mexico in 1936, the Convention for the Protection of Birds and Their Environment with Japan in 1972 and the Convention for the Conservation of Migratory Birds and Their Environment with the Union of Soviet Socialist Republics in 1978.

These migratory bird conventions impose substantive obligations on the United States for the conservation of migratory birds and their habitats, and through the Migratory Bird Treaty Act, the United States has implemented these migratory bird conventions with respect to the United States. Executive Order 13186 directs executive departments and federal agencies taking actions that have, or are likely to have, a measurable negative effect on migratory bird populations to develop and implement, within two years, a MOU with the USFWS that shall promote the conservation of migratory bird populations.

Invasive Species - Executive Order 13112

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

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 until a reasonable effort has been made to protect the items and the proper authority has been notified.

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

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

Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)

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.

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.

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

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

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

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

New Animal Drugs for Investigational Use

The FDA can grant permission to use investigational new animal drugs. An investigational new animal drug may be used by experts, qualified by scientific training and experience, to investigate their safety and effectiveness, if the requirements for the exemption set forth in 21 CFR part 511 are met.

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 birds that may cause safety and health concerns at workplaces.

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 (Article 11 of NYS Environmental Conservation Law)."

CHAPTER 2: ISSUES AND ALTERNATIVES

Chapter 2 contains a discussion of the issues that will receive detailed environmental impact analysis in Chapter 3 (Environmental Effects), a description of the damage management strategies available for inclusion in the alternatives, a discussion of the WS Decision model (Slate et al. 1992), and SOPs for bird damage management. Chapter 2 also discusses the alternatives that were developed to address the identified issues and the alternatives considered but not analyzed in detail, with rationale. This chapter also contains a description of the 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.

2.1 ISSUES USED TO DEVELOP 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 associated with birds were developed by WS in consultation with the USFWS and the NYSDEC. The issues analyzed in detail are the following:

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

A common issue when addressing damage caused by wildlife is the potential impact of management actions on the populations of target species. Methods available to resolve damage or threats to human safety are categorized into nonlethal and lethal methods. Available nonlethal 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 nonlethal methods were employed. Lethal methods would result in local reductions in the area where damage or threats were occurring. The number of individuals of target species that could be removed from the population using lethal methods under the alternatives would be dependent on the number of requests for assistance received, the number of individual birds involved with the associated damage or threat, and the efficacy of methods employed. Under certain alternatives, both nonlethal and lethal methods could be recommended, as governed by federal, state, and local laws and regulations.

The analysis for magnitude of impact on the populations of those species addressed in the EA would be based on a measure of the number of individuals lethally removed from each species in relation to that species' abundance and/or legal status. Magnitude may be determined either quantitatively or qualitatively. Quantitative determinations would be based on population estimates, allowable harvest levels, and actual harvest data. Qualitative determinations would be based on population trends and harvest trend data, when available. Generally, WS only conducts damage management on species whose population densities are high and usually only after they have caused damage. Management actions would be monitored by comparing the number removed with overall populations or trends in the population. All lethal removal of birds by WS would occur at the requests of a cooperator seeking assistance and only after the removal of birds has been permitted by the USFWS pursuant to the MBTA, when required.

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

A common issue when addressing damage caused by wildlife is the potential impacts of management actions on non-target species, including threatened and endangered species. Methods available to resolve damage or threats of damage can be categorized as lethal and nonlethal. Nonlethal methods disperse or otherwise make an area where damage is occurring unattractive to the species (target species) causing the damage, thereby reducing the presence of those species in the area. However, nonlethal methods also have the potential to inadvertently disperse non-target wildlife. Lethal methods remove individuals of the species (target species) causing the damage, thereby reducing the presence of those species in the area. However, lethal methods also have the potential to inadvertently capture, injure, or kill non-target wildlife.

The Endangered Species Act (ESA) makes it illegal for any person to '*take*' any federally listed endangered or threatened species or their critical habitat. 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 Act requires that federal agencies conduct their activities in a way to conserve species. It also requires that federal agencies consult with the appropriate implementing agency (either the USFWS or the National Marine Fisheries Service) 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 once were more prevalent in New York. Specifically, these species are listed as threatened and endangered under the NYS Endangered Species Law. The NYSDEC could issue limited permits for harassment and incidental take of listed species for the purposes of research and protection of property, human safety, and agriculture. WS-New York will work closely with NYSDEC to monitor listed species in the state. If there is a change in state-listed species, WS-New York will adjust management strategies accordingly and in consultation with NYSDEC.

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 Protection 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 discuss the potential for WS' activities to disturb eagles as defined by the Act.

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

An additional issue often raised is the potential risks to human health and safety associated with employing methods to manage damage caused by target species. Both chemical and non-chemical methods have the potential to have adverse effects on human safety. Risks can occur to persons employing methods and to persons coming into contact with methods. Risks can be inherent to the method itself or related to the misuse of the method. 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 may 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. 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.

Safety of Chemical Methods Employed

The issue of using chemical methods as part of managing damage associated with wildlife relates to the potential for human exposure either through direct contact with the chemical, or exposure to the chemical from wildlife that have been exposed. Under the alternatives identified, the use of chemical methods would include avicides, immobilizing drugs, reproductive inhibitors, and repellents. Avicides are those chemical methods used to lethally remove birds. DRC-1339 is an avicide currently being considered for use to manage damage in this assessment. DRC-1339 is registered for use by WS for management of damage associated with rock pigeons, red-winged blackbirds, brown-headed cowbirds, common grackles, boat-tailed grackles, European starlings, American crows, fish crows, common ravens, herring gulls, great black-backed gulls, laughing gulls, ring-billed gulls, and other birds. Use of this pesticide is limited to commercial animal operations, staging areas, gull colonies, and gull feeding or loafing sites.

Several avian repellents are commercially available to disperse birds from an area or discourage birds from feeding on desired resources. Avitrol is an avian frightening agent available for use to manage damage associated with rock pigeons, house sparrows, red-winged blackbirds, common grackles, boat-tailed grackles, brown-headed cowbirds, European starlings, and other birds. Other repellents are also available with the most common ingredients being polybutene and methyl anthranilate.

Chemical methods are further discussed in Appendix B of this EA. The use of chemical methods is regulated by the EPA through the FIFRA, by the NYSDEC, by the FDA, and by WS directives.

Safety of Non-Chemical Methods Employed

Most methods available to alleviate damage and threats associated with birds are considered non-chemical methods. Non-chemical methods employed to reduce damage and threats to safety caused by birds, if misused, could potentially be hazardous to human safety. Non-chemical methods are also discussed in detail in Appendix B. Many of the non-chemical methods are activated by attending personnel (e.g., cannon nets, firearms, pyrotechnics, lasers, remote control vehicles), are passive live-capture methods (e.g., walk-in style live-traps, mist nets), or are passive harassment methods (e.g., effigies, exclusion, anti-perching devices, electronic distress calls).

The primary safety risk of most non-chemical methods occurs directly to the applicator or those persons assisting the applicator. However, risks to others do exist when employing non-chemical methods, such as when using firearms, cannon nets, or pyrotechnics. Most of the non-chemical methods available to address bird damage would be available for use under any of the alternatives and could be employed by any entity, when permitted. Risks to human safety from the use of non-chemical methods will be further evaluated as this issue relates to the alternatives in Chapter 3.

Issue 4 - Effects of Damage Management Activities on the Aesthetic Value of Birds

Another issue is the concern that the proposed action or the other alternatives would result in the loss of aesthetic benefits of target birds to the public, resource owners, or residents in the area where damage management activities occur. Wildlife generally is regarded as providing utilitarian, monetary, recreational, scientific, ecological, economic, existence and historic values (Decker and Goff 1987, Conover 2002), and the mere knowledge that wildlife exists is a positive benefit to many people. Aesthetics is the philosophy dealing with the nature of beauty, or the appreciation of beauty. Therefore, aesthetics is truly subjective in nature, dependent on what an observer regards as beautiful.

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

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

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

Public attitudes toward wildlife vary considerably. Some people believe that all wildlife should be captured and translocated to another area to alleviate damage or threats to protected resources. Some people directly affected by the problems caused by wildlife strongly support removal. Individuals not directly affected by the harm or damage may be supportive, neutral, or totally opposed to any removal of wildlife from specific locations. Some people totally opposed to wildlife damage management want agencies to teach tolerance for damage and threats caused by wildlife, and that wildlife should never be killed or even harassed. Some of the people who oppose removal of wildlife do so because of human-affectionate bonds with individual wildlife. Those human-affectionate bonds are similar to attitudes of a pet owner and result in aesthetic enjoyment. The effects on the aesthetic value of birds from implementation of the identified alternatives, including the proposed action, are analyzed in Chapter 3.

2.2 DAMAGE MANAGEMENT STRATEGIES AVAILABLE FOR INCLUSION IN THE 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 modification of cultural practices (e.g., animal husbandry), habitat modification (e.g., exclusion), animal behavior modification (e.g., scaring), removal of individual offending animals, local reductions, elimination of invasive species (e.g., European starlings) or any combination of these, depending on the circumstances of the specific damage problem.

IWDM Strategies

Operational Damage Management Assistance (Direct Control)

Operational damage management assistance, otherwise referred to as direct control, includes damage management activities that are directly conducted by or supervised by personnel of WS. Operational damage management assistance may be initiated when the problem cannot effectively be resolved through technical assistance alone and there is a written MOU, cooperative service agreement, or other comparable document between WS and the entity requesting assistance. 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 resolve problems, especially if restricted-use chemicals are necessary or if the problems are complex.

To address the anticipated needs of property owners/managers with bird damage that may request WS' assistance with lethal methods to alleviate their damages, WS would submit an application for a one-year depredation permit to the USFWS estimating the maximum number of birds of each species to be lethally removed as part of an integrated approach. The USFWS would conduct an independent review of the application, and if acceptable, issue a permit as allowed under the depredation permit regulations. WS could request an amendment of their permit to increase the number of birds that could be removed to address unpredicted and emerging bird damages /conflicts. Each year, WS would submit an application for renewal of their permit, and using adaptive management principles, would adjust numbers of birds to meet anticipated needs, based upon management actions in the previous year and anticipated damages and conflicts in the next year. The USFWS would review these applications annually, and issue permits as allowed by regulations. All alterations in the number of birds to be removed would be checked against the impacts analyzed in this EA. All management actions by WS would comply with appropriate federal, state, and local laws.

Technical Assistance

The WS program regularly provides technical assistance to individuals, organizations, and other federal, state, and local government agencies for managing bird damage. Technical assistance includes collecting information about the species involved, the nature and extent of the damage, and previous methods that the cooperator has attempted to resolve the problem. WS then provides information on appropriate methods that the cooperator may consider to resolve the damage

themselves. Types of technical assistance projects may include a visit to the affected property, written communication, telephone conversations, or presentations to groups such as homeowner associations or civic leagues. 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 bird damage problems.

Education and Outreach

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. In addition to the routine dissemination of recommendations and information to individuals or organizations sustaining damage, WS provides lectures, courses, and demonstrations to producers, homeowners, state and county agents, colleges and universities, and other interested groups. Cooperating agencies frequently collaborate with other entities in education and public information efforts. Additionally, technical papers are presented at professional meetings and conferences so that other wildlife professionals and the public are periodically updated on recent developments in damage management technology, projects, laws and regulations, and agency policies.

Research and Development

The National Wildlife Research Center (NWRC) functions as the research unit of WS. NWRC uses scientific expertise to develop methods to resolve conflicts between humans and animals while maintaining the quality of the human environment. NWRC research biologists work closely with wildlife managers, researchers, and others to develop and evaluate damage management techniques. NWRC biologists have authored hundreds of scientific publications and reports, and are respected worldwide for their expertise.

WS' Decision Making Procedures

Decision Model

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

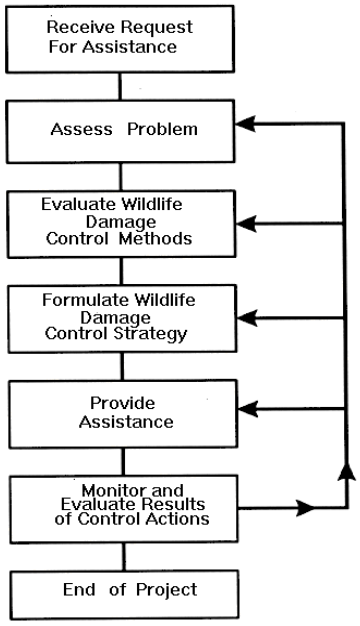

Figure 2.1 WS Decision Model as presented by Slate et al. (1992) for developing a strategy to respond to a request for assistance with human-wildlife conflicts.

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 birds and effective, practical, and reasonable methods available to the local decision-maker(s) to reduce damage or threats. This could include nonlethal and lethal methods. WS and other state and federal wildlife management agencies may facilitate discussions at local community meetings when resources are available. Resource owners and others directly affected by bird damage or conflicts have direct input into the resolution of such problems. They may implement management recommendations provided by WS or others, or may request management assistance from WS, other wildlife management agencies, local animal control agencies, or private businesses or organizations.

By involving decision-makers in the process, damage management actions can be presented to allow decisions to involve those individuals that the decision-maker(s) represents. Requests for assistance to manage birds often originate from the decision-maker(s) based on community feedback or from concerns about damage or threats to human safety. As representatives, the decision-maker(s) are able to provide the information to local interests either through technical assistance provided by WS or through demonstrations and presentations by WS on activities to manage damage. This process allows decisions on activities to be made based on local input.

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.

Tribal Property Decision Makers

The WS program in New York would only conduct damage management activities on Native American lands when requested by a Native American Tribe. Activities would only be conducted after a MOU, cooperative service agreement, or other agreement had been signed between WS and the Tribe requesting assistance. Therefore, the Tribe would determine when WS' assistance was required and what activities would be allowed. Because Tribal officials would be responsible for requesting assistance from WS and determining what methods would be available to alleviate damage, no conflict with traditional cultural properties or beliefs would be anticipated. Those methods available to alleviate damage associated with birds 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.

2.3 STANDARD OPERATING PROCEDURES FOR BIRD DAMAGE MANAGEMENT

SOPs improve the safety, selectivity, and efficacy of those methods available to resolve or prevent damage. The current WS program uses many such SOPs. Those SOPs would be incorporated into activities conducted by WS when addressing bird 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 consistently be used and applied when addressing bird 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.

- Applicable Safety Data Sheets and site safety protocols would be provided to all WS' personnel involved with specific damage management activities.

- Reasonable and prudent measures would be established through consultation when necessary with the USFWS and the NYSDEC and implemented to avoid adverse impacts to T&E species.

- Carcasses of birds retrieved after damage management activities have been conducted are disposed of in accordance with WS Directive 2.515.

- All personnel who would use chemicals are trained and certified to use such substances or would be supervised by trained or certified personnel.

- All personnel who use firearms would be trained according to WS' Directive 2.615.

- Management actions would be directed toward specific birds posing a threat to human safety or causing damage to agriculture, natural resources, or property.

- Personnel would be trained in the most humane and effective devices/methods for removing problem birds.

- WS' use of euthanasia methods would comply with WS Directive 2.505.

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

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

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

- Management actions would be directed toward specific birds that are causing or at risk of causing damage.

- The removal of birds would occur under conditions permitted or allowed by the USFWS, NYSDEC, and local ordinances.

- Lethal removal of birds by WS would be monitored by WS and reported to the USFWS to evaluate population trends and the magnitude of WS' removal of birds in the state.

- Preference would be given to nonlethal methods, when practical and effective. If practical and effective nonlethal control methods are not available and if lethal control methods are available and appropriate for WS to implement, WS may implement lethal methods.

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

- When conducting removal operations via shooting, identification of the target animal would occur prior to application.
- WS' personnel would use bait, trap placements, and capture devices that are strategically placed at locations likely to capture a target animal and minimize the potential of non-target wildlife captures.
- Personnel would be present during the use of live-capture methods, or live-traps would be checked in accordance to state and federal regulation or guidance to ensure non-target species are released in a timely manner or are prevented from being captured.
- The presence of non-target species would be monitored before using DRC-1339 to reduce the risk of mortality of non-target species' populations.
- Any non-target wildlife captured in traps, nets, or any other restraining device would be released whenever it is possible and safe to do so.
- WS would consult the USFWS iPaC website and the NYSDEC Environmental Resource mapper as necessary to check for indication or presence of threatened and endangered species.

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

- All personnel who use chemicals, firearms, or pyrotechnics would be trained according to WS Directives (2.430, 2.615, and 2.625).
- Damage management via shooting would be conducted during times when public activity and access to the control areas are reduced/restricted.
- WS employees who use immobilizing drugs would participate in approved training courses.
- WS would adhere to all established withdrawal times (the amount of time that must pass before an animal can enter the food supply) when using immobilizing drugs for the capture of waterfowl that are agreed upon by WS, the USFWS, and the NYSDEC. Although unlikely, in the event that WS is requested to immobilize waterfowl either during a period of time when harvest of waterfowl is occurring or during a time where the withdrawal period could overlap with the start of a harvest season, WS would euthanize the animal or mark the animal as not safe for human consumption.
- Damage management activities would be conducted professionally and in the safest manner possible to maintain a safe environment in and around human activity.
- All chemical methods used by WS or recommended by WS would be registered with the EPA, FDA, and the NYSDEC.

Issue 4 - Effects of Damage Management Activities on the Aesthetic Value of Birds

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

2.4 ALTERNATIVES CONSIDERED IN DETAIL

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 birds.

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

The proposed action/no action alternative would continue the current implementation of an adaptive integrated approach utilizing nonlethal and lethal techniques, as deemed appropriate to reduce damage and threats caused by birds. This approach would integrate the most practical and effective methods available to resolve bird damage. WS, in cooperation with the USFWS and 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. City/town managers, agricultural producers, property owners, and others requesting assistance would be provided information regarding the use of appropriate nonlethal and lethal techniques.

To be most effective, damage management activities should begin as soon as birds begin to cause damage. Bird damage that has been ongoing can be difficult to resolve using available methods since birds are conditioned to feed, roost, loaf, and are familiar with a particular location. Subsequently, making that area unattractive using available methods can be difficult to achieve when damage has been ongoing. WS would work closely with those entities requesting assistance to identify situations where damage could occur and 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 cooperator.

Nonlethal methods recommended and used by WS may include resource management, physical exclusion, human behavior modification, habitat modification, repellents, reproductive control, frightening devices, lure crops, trap and translocation, and other deterrents. Lethal methods recommended and used by WS may include the use of shooting, live capture and euthanasia, DRC-1339, the recommendation of harvest during hunting seasons, and nest/egg destruction (see Appendix B for a complete list and description of potential methods). WS would employ humane methods of euthanasia, such as those recommended by the American Veterinary Medical Association (AVMA). The AVMA acknowledges that the primary limitation on humaneness of methods for free-ranging wildlife is the lack of control over the animal; therefore, WS selects the best method given the circumstances encountered (AVMA 2013).

Lethal and nonlethal methods are intended to be short-term attempts at reducing damage occurring at the time those methods are employed. Long-term solutions to managing bird damage would include limited habitat manipulations and changes in cultural practices that are addressed further below and in Appendix B.

Under this alternative, WS would respond to requests for assistance in three ways: 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 birds, or 3) providing technical assistance and operational assistance to property owners or managers experiencing damage. Operational assistance may include work done under WS' permits or under cooperator permits.

Property owners or managers requesting assistance would be provided with information regarding both the use of effective and practical nonlethal as well as lethal techniques available to achieve their goals. Property owners or managers may choose to implement WS' recommendations themselves under a permit (i.e., technical assistance), use contractual services of private businesses, use volunteer services of private organizations, use the contractual services of WS (i.e., operational assistance), or take no action. The only method currently available that would not be available for use by those persons experiencing bird damage is the avicide DRC-1339, which can only be used by WS.

The removal of birds can only legally occur as authorized by the USFWS or NYSDEC through the issuance of a depredation permit, and only at levels specified in the permit. When applying for a depredation permit, the requesting entity submits with the application the number of birds requested to be taken to alleviate the damage. Therefore, under this alternative, the USFWS could: 1) deny an application for a depredation permit when requested to alleviate bird damage, 2) could issue a depredation permit at the removal levels requested, or 3) could issue permits at levels below those removal levels requested.

Alternative 2 - Bird Damage Management by WS using only Nonlethal Methods

Under this alternative, WS would be restricted to only using nonlethal methods to resolve damage caused by birds (Appendix B). Lethal methods could continue to be used under this alternative by those persons experiencing damage without involvement by WS. In situations where nonlethal methods were impractical or ineffective to alleviate damage, WS could refer requests for information regarding lethal methods to the state, local animal control agencies, or private businesses or organizations. Property owners or managers may choose to implement WS' nonlethal recommendations on their own or with the assistance of WS, implement lethal methods on their own via the permitting process through the USFWS or NYSDEC, or request assistance (nonlethal or lethal) from a private or public entity other than WS.

Alternative 3-No Bird Damage Management Conducted by WS

This alternative precludes any activities by WS to reduce threats to human health and safety, and alleviate damage to agricultural resources, property, and natural resources. WS would not be involved with any aspect of bird damage management. All requests for assistance received by WS to resolve damage caused by birds would be referred to the USFWS, the NYSDEC, and/or private entities. This alternative would not deny other federal, state, and/or local agencies, including private entities from conducting damage management activities directed at alleviating damage and threats associated with birds.

Despite no involvement by WS in resolving damage and threats associated with birds, those persons experiencing damage caused by birds could continue to resolve damage by employing those methods legally available. The removal of birds could occur either through: the issuance of depredation permits by the USFWS; harvest during the hunting seasons; a depredation order allowing blackbirds to be removed at any time when they are causing or about to cause damage, or posing a threat to human safety; a control order allowing Muscovy ducks could be removed. Additionally, non-native bird species could be removed without the need for a depredation permit issued by the USFWS. All methods described in Appendix B would be available for use by those persons experiencing damage or threats except for the use of DRC-1339 for rock pigeons, red-winged blackbirds, brown-headed cowbirds, common grackles, boat-tailed grackles, European starlings, American crows, fish crows, common ravens, herring gulls, great black-backed gulls, laughing gulls, ring-billed gulls, and other birds, which can only be used by WS.

2.5 ALTERNATIVES CONSIDERED BUT NOT ANALYZED IN DETAIL

In addition to those alternatives analyzed in detail, several other alternatives were identified; however, those alternatives will not receive detailed analyses in this EA for the reasons provided. Those alternatives considered, but not analyzed in detail include:

All Nonlethal Methods Implemented Before Lethal Methods

This alternative would require that all nonlethal methods or techniques described in Appendix B be applied to all requests for assistance to reduce damage and threats to safety from birds prior to applying lethal methods. If the use of all nonlethal 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. Nonlethal 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 bird damage.

Those persons experiencing damage often employ nonlethal 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 nonlethal applications are necessary before the initiation of lethal methods. Thus, only the presence or absence of nonlethal methods can be evaluated. The proposed action (Alternative 1) is therefore similar to an all nonlethal before lethal alternative because the use of nonlethal methods is considered before lethal methods by WS (WS Directive 2.101). Adding a nonlethal before lethal alternative and the associated analysis would not add additional information to the analyses in this EA.

Use of Only Lethal Methods by WS

This alternative would require the use of lethal methods only to reduce threats and damage associated with birds. However, nonlethal methods can be effective in preventing damage in certain instances. Under WS Directive 2.101, WS must consider the use of nonlethal methods before lethal methods. In those situations where damage could be alleviated using nonlethal methods, those methods would be employed or recommended as determined by the WS Decision Model. Therefore, this alternative was not analyzed in detail.

Trap and Translocate Only

Under this alternative, all requests for assistance would be addressed using live-capture methods or the recommendation of live-capture methods. Birds would be live-captured using live-traps, cannon nets, rocket nets, bow nets, or mist nets. All birds live-captured through direct operational assistance by WS would be translocated. Translocation is defined as moving an animal from its home range to an entirely new area. Prior to the live capture and translocation of these birds, translocation sites would be identified in consultation as necessary with the NYSDEC, New Jersey Department of Environmental Protection, the USFWS, and/or the property owner where the translocated birds would be placed.

Live-capture and translocation could be conducted as part of the alternatives analyzed in detail. However, the translocation of birds could only occur under the authority of the USFWS and/or NYSDEC. When requested by the USFWS and/or the NYSDEC, WS could translocate birds 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 birds unless authorized by the NYSDEC and/or the USFWS, this alternative was not considered in detail.

Compensation for Damage

The compensation only alternative would require WS to establish a system to reimburse persons impacted by bird damage. Reimbursement provides producers monetary compensation for losses; it does not remove the problem nor does it assist with reducing future losses. Under such an alternative, WS would continue to provide technical assistance to those persons seeking assistance with managing damage. In addition, WS would conduct site visits to verify damage. Aside from the lack of legal authority, examination of this alternative indicates that the concept has many drawbacks (Wagner et al. 1997):

- It would require large expenditures of money and labor to investigate and validate all damage claims, and to determine and administer appropriate compensation.
- Based on historical instances, compensation would most likely be below full market value.
- Compensation would give little incentive to resource owners to limit damage through improved cultural 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.

Technical Assistance Only

This alternative would restrict WS to only providing technical assistance (advice) on BDM. Producers, property owners, agency personnel, or others could obtain permits from the USFWS and/or the NYSDEC as needed and could conduct bird damage management using any of the legally available nonlethal and lethal techniques. Technical assistance information is also readily available from entities other than WS such as the USFWS, universities, extension agents, FAA, and private individual and organizations. Environmental impacts of this alternative are likely to be similar to Alternative 3. Consequently, the agencies have determined that detailed analysis of this alternative would not contribute substantive new information to the understanding of environmental impacts of damage management alternatives and have chosen to not analyze this alternative in detail.

CHAPTER 3: ENVIRONMENTAL EFFECTS

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 as those alternatives relate to the issues identified. Environmental consequences can be direct, indirect, and cumulative.

Direct Effects: These are 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 ISSUES CONSIDERED IN DETAIL AND THEIR ASSOCIATED IMPACTS BY ALTERNATIVE

The proposed action/no action alternative 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, the USFWS, and the NYSDEC.

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

Population Impact Analyses of the Alternatives

The alternatives were developed in response to the issues identified in Chapter 2. The issue of the potential impacts of conducting the alternatives on the populations of target bird species is analyzed for each alternative below.

Information on bird populations and trends can be difficult to acquire, and are often derived from several sources including the Breeding Bird Survey (BBS), Partners in Flight Landbird Population database, the Christmas Bird Count, harvest data, and published data. For the purposes of this document, WS first searched the Partners in Flight Landbird Population database for estimates and used this information when available. If no population estimate was available through this source, WS then looked to other sources, or contacted USFWS or NYSDEC directly to attain population estimates for those species. When using the Partners in Flight Landbird Population database, WS would use the New York State population estimate, when available, or would otherwise use the smallest scale population estimate that was available (e.g. continental population estimate, global population estimate). Further information on sources of population data is provided below.

Breeding Bird Survey (BBS)

Bird populations can be monitored by using trend data derived from data collected during the BBS. Under established guidelines, observers count birds at established survey points for a set duration along a pre-determined route, usually along a road. Routes are 24.5 miles long and are surveyed once per year with the observer stopping every 0.5 miles along the designated route. The numbers of birds observed and heard within 0.25 miles of each survey point during a 3-minute sampling period are recorded. Surveys were started in 1966 and are conducted in June, which is generally considered as the period of time when those birds present at a location are likely breeding in the immediate area. The BBS is conducted annually in the United States, across a large geographical area, under standardized survey guidelines. The BBS is a large-

scale inventory of North American birds coordinated by the United States Geological Survey, Patuxent Wildlife Research Center (Sauer et al. 2014). The BBS is a combined set of over 3,700 roadside survey routes primarily covering the continental United States and southern Canada. The primary objective of the BBS has been to generate an estimate of population change for all breeding birds. Populations of birds tend to fluctuate, especially locally, because of variable local habitat and climatic conditions. Trends can be determined using different population equations and tested to identify whether it is statistically significant.

Current estimates of population trends from BBS data are derived from hierarchical model analysis (Link and Sauer 2002, Sauer and Link 2011) and are dependent upon a variety of assumptions (Link and Sauer 1998). The statistical significance of a trend for a given species is also determined using BBS data (Sauer et al. 2014).

Partners in Flight Landbird Population Estimate

The BBS data are intended for use in monitoring bird population trends, but it is also possible to use BBS data to develop a general estimate of the size of bird populations. Using relative abundances derived from the BBS, Rich et al. (2004) extrapolated population estimates for many bird species in North America as part of the Partners in Flight Landbird Population Estimate database. The Partners in Flight system involves extrapolating the number of birds in the 50 quarter-mile circles (total area/route = 10 mi^2) survey conducted during the BBS to an area of interest. The model used by Rich et al. (2004) makes assumptions on the detectability of birds, which can vary for each species. Some species of birds that are more conspicuous (visual and auditory) are more likely to be detected during bird surveys when compared to bird species that are more secretive and do not vocalize often. Information on the detectability of a species is combined to create a detectability factor, which may be combined with relative abundance data from the BBS to yield a population estimate (Rich et al. 2004). The Partners in Flight Science Committee (2019) updated the database in 2019 to reflect current population estimates.

Christmas Bird Count

The CBC is conducted in December and early January annually by numerous volunteers under the guidance of the National Audubon Society (NAS). The CBC reflects the number of birds frequenting a location during the winter months. Participants count the number of birds observed along a specified route within a 15-mile diameter circle (177 mi^2). The CBC data does not provide a population estimate, but the count data can be used as an indicator of trends in the population of a particular bird species over time. Researchers have found that population trends reflected in CBC data tend to correlate well with those from censuses taken by more stringent means (NAS 2018*b*).

Annual Harvest Estimates

The populations of several migratory bird species are sufficient to allow for annual harvest seasons that typically occur during the fall migration periods of those species. Migratory bird hunting seasons are established under frameworks developed by the USFWS and implemented by the NYSDEC. Those species addressed in this EA that have established hunting seasons include the American black duck, American coot, American crow, American wigeon, Atlantic brant, blue-winged teal, bufflehead, canvasback, common goldeneye, common merganser, fish crow, greater scaup, greater snow goose, green-winged teal, hooded merganser, lesser scaup, long-tailed duck, mallards, northern shoveler, northern pintail, red-breasted merganser, redhead, ring-necked duck, ring-necked pheasant, ruddy duck, wild turkey, and the wood duck.

For crows, removal can also occur under the blackbird depredation order established by the USFWS pursuant to the MBTA. Therefore, the removal of crows can occur during annual hunting seasons and under the blackbird depredation order that allows crows to be removed to alleviate damage and to alleviate threats of damage. For many migratory bird species considered harvestable during a hunting season, the number of birds harvested during the season is reported by the USFWS and/or the NYSDEC in published reports. Harvest estimates can also be used to monitor trends in bird populations over time.

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

Under the proposed action, WS would continue to provide both technical assistance and direct operational assistance using methods described in Appendix B to those persons requesting assistance with managing damage and threats associated with birds. WS' lethal removal is monitored by comparing numbers of animals killed with overall populations or trends in populations to assure the magnitude of removal is maintained below the level that would cause significant adverse impacts to the viability of native species' populations. The potential impacts on the populations of target bird species from the implementation of the proposed action are analyzed for each species below. Populations were reported at the state level when available, but continental or global populations were reported when state level data could not be found. Breeding Bird Survey (BBS) population trends from 1966 to 2015 for New York and the Eastern Region are also listed for each species when available (BBS 2017). The statistical significance of a trend for a given species that is determined by the BBS data is color coded: a black percentage indicates a statistically insignificant positive or negative trend, a red percentage indicates a statistically significant negative trend, and a blue percentage indicates a statistically significant positive trend (BBS 2017). The authorization and removal numbers under depredation permits in New York were obtained from USFWS Service Permit Issuance and Tracking System data, when available, and from WS' Management Information System.

Nonlethal methods can disperse or otherwise make an area unattractive to birds causing damage; thereby, reducing the presence of birds at the site and potentially the immediate area around the site where nonlethal methods are employed. Nonlethal methods would be given priority when addressing requests for assistance (WS Directive 2.101). However, nonlethal methods would not necessarily be employed or recommended to resolve every request for assistance if deemed inappropriate by WS' personnel using the WS Decision Model. For example, if a cooperator requesting assistance has already used nonlethal methods, WS would not likely recommend or continue to employ those particular methods if their use has already been proven ineffective in adequately resolving the damage or threat.

Many nonlethal methods are used to exclude, harass, and disperse target wildlife from areas where damage or threats are occurring. When effective, nonlethal methods would disperse birds from the area resulting in a reduction in the presence of those birds at the site where those methods were employed. However, birds responsible for causing damage or threats are moved to other areas with minimal impact on those species' populations. Nonlethal 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. Nonlethal methods are generally regarded as having minimal impacts on overall populations of wildlife since individuals of those species are unharmed. The use of nonlethal methods would not have adverse impacts on bird populations in the state under any of the alternatives.

The use of lethal methods could result in local reductions in the area where damage or threats were occurring since birds would be removed from the population. Lethal methods are often employed to reinforce nonlethal methods and to remove birds that have been identified as causing damage or posing a threat to human safety. The use of lethal methods would result in local reductions of birds in the area where damage or threats were occurring. The number of birds removed from the population using lethal methods would be dependent on the number of requests for assistance received, the number of birds involved with the associated damage or threat, and the efficacy of methods employed. The permitting of the removal by the USFWS and the NYSDEC pursuant to the MBTA ensures removal by WS and by other entities occurs within allowable removal levels to achieve the desired population objectives.

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

Generally, WS only conducts damage management on species whose population densities are high or concentrated and usually only after they have caused damage. The issue of the potential impacts of conducting the alternatives on the populations of those target bird species addressed in this EA is analyzed for each alternative below. Table 3.1 summarizes WS' proposed removal and translocation for birds analyzed in this EA. Canada geese are covered in a separate EA (USDA 2017*b*), and are therefore not addressed in this EA.

Table 3.1 Summary of WS' proposed statewide annual removal and translocation of birds analyzed in this EA.

Species	WS Proposed Removal of Birds and Nests	WS Proposed Translocation	Species	WS Proposed Removal of Birds and Nests	WS Proposed Translocation
American black duck	50 + 10 nests		Horned lark	50	
American coot	20		House sparrow	250 + 100 nests	
American kestrel	50	500	Indian peafowl	20	
American oystercatcher	10 + 5 nests		Killdeer	200 + 100 nests	
American robin	200 + 50 nests		Laughing gull	2,500 + 150 nests	
American wigeon	20		Lesser scaup	20	
Atlantic brant	250		Long-eared owl	-	25
Bald eagle	0 + 5 nests		Long-tailed duck	20	
Barn owl	10	25	Mallard	250 + 150 nests	
Barn swallow	500 + 250 nests		Merlin	5	25
Barred owl	10 + 5 nests	25	Monk parakeet	20 + 20 nests	
Belted kingfisher	20		Mourning dove	1,500 + 50 nests	
Black-crowned night heron	20 + 20 nests		Mute swan	500 + 250 nests	
Black vulture	750		Northern cardinal	20	
Blue jay	20 + 20 nests		Northern flicker	50 + 10 nests	
Blue-winged teal	20		Northern goshawk	10	25
Boat-tailed grackle	20 + 20 nests		Northern harrier	-	25
Bonaparte's gull	20		Northern mockingbird	100 + 25 nests	
Brown-headed cowbird	5,000		Northern pintail	20	
Budgerigar	20		Northern rough-winged swallow	20	
Bufflehead	20		Northern shoveler	20	
Canvasback	20		Northern saw-whet owl	-	25
Cattle egret	20		Osprey	20 + 10 nests	25
Cliff swallow	100 + 200 nests		Peregrine falcon	-	25
Common goldeneye	20		Pileated woodpecker	20	
Common grackle	2,000		Red-bellied woodpecker	20	
Common loon	20		Red-breasted merganser	20	
Common merganser	20		Redhead	20	
Common raven	20 + 10 nests		Red-headed woodpecker	20	
Coopers hawk	20	75	Red-shouldered hawk	10	25
Crow (American or Fish)	1,100 + 10 nests		Red-tailed hawk	200 + 20 nests	200
Dark-eyed junco	50		Red-throated loon	20	
Double-crested cormorant	2,000 + 500 nests		Red-winged blackbird	10,000	
Downy woodpecker	50 + 10 nests		Ring-billed gull	2,500 + 10,000 nests	
Eastern meadowlark	100		Ring-necked duck	20	
Eastern screech owl	10	25	Ring-necked pheasant	20	

European starling	250,000 + 200 nests		Rock pigeon	10,000 + 250 nests	
Feral chicken	20		Rough-legged hawk	10	25
Feral waterfowl	50 + 20 nests		Ruddy duck	40	
Gadwall	20 + 10 nests		Savannah sparrow	20	
Glossy ibis	75		Sharp-shinned hawk	10	25
Great black-backed gull	300 + 300 nests		Short-eared owl		25
Great blue heron	50 + 20 nests		Snow bunting	20	
Great egret	50 + 20 nests		Snowy egret	40 + 20 nests	
Great horned owl	10 + 5 nests	25	Snowy owl	30	100
Greater scaup	20		Song sparrow	20	
Greater snow goose	100		Tree swallow	100 + 200 nests	
Green heron	20		Turkey vulture	200	
Green-winged teal	20		Wild turkey	250 + 100 nests	250
Hairy woodpecker	50 + 10 nests		Willet	20 + 10 nests	
Herring gull	2,500 + 2,000 nests		Wood duck	20 + 10 nests	
Hooded merganser	20		Yellow-bellied Sapsucker	20	
Horned grebe	20		Yellow-crowned night-heron	20	

Inconsequential/Undetectable Target Species Removal

Bird management conducted by WS is often associated with species that have healthy and thriving populations. WS has determined that if the proposed lethal removal of any given species is less than 1% of either the estimated New York State population or the past 5-year average Christmas Bird Count (CBC) estimate in New York, then the impact will be inconsequential and undetectable. The estimates from these two sources are often considered conservative as they rely on survey data that will indeed leave some individuals undetected within the survey area. In fact, the CBC is a mere snapshot estimate of the detected birds during a three week time period during winter.

If WS' proposed lethal removal is less than 1% of these estimates, the impact to their populations and the surrounding environment will be insignificant. Furthermore, WS' proposed removal combined with other forms of mortality are not expected to create significant indirect or cumulative impacts to these species' populations. Because the impact on these particular species has been deemed insignificant and management methods performed by WS will not affect their overall population statuses within New York, no further analysis is warranted. Tables 3.2 (non-game species) and 3.3 (game species) list the birds that fall under this category.

Table 3.2 WS' Proposed statewide annual lethal removal that is less than 1% of the state population data for non-game species in New York.

Species	NYS Population Estimate*	Proposed WS lethal removal	WS Take as Percent of the State Population
American Kestrel	21,000	50	0.24
American Robin	6,400,000	200	<0.01
Barn Swallow	710,000	500	0.07
Barred Owl	47,000	10	0.02
Belted Kingfisher	19,000	20	0.11
Blue Jay	470,000	20	<0.01
Brown-headed Cowbird	630,000	5,000	0.79
Cliff Swallow	71,000	100	0.14
Common Grackle	1,100,000	2,000	0.18
Common Raven	13,000	20	0.15
Cooper's Hawk	9,800	20	0.20

Dark-eyed Junco	560,000	50	<0.01
Downy Woodpecker	340,000	50	0.01
Eastern Meadowlark	110,000	100	0.09
Eastern Screech Owl	9,900	10	0.10
Great-horned Owl	5,500	10	0.18
Hairy Woodpecker	160,000	50	0.03
Horned Lark	62,000	50	0.08
House Sparrow	1,300,000	250	0.02
Merlin	1,800	5	0.28
Mourning Dove	1,300,000	1,500	0.12
Northern Flicker	100,000	50	0.05
Northern Mockingbird	64,000	100	0.16
Northern rough-winged Swallow	36,000	20	0.06
Pileated Woodpecker	38,000	20	0.05
Red-bellied Woodpecker	120,000	20	0.02
Red-shouldered Hawk	6,200	10	0.16
Red-winged Blackbird	2,600,000	10,000	0.38
Sharp-shinned Hawk	89,800	10	0.10
Tree Swallow	380,000	100	0.03
Yellow-bellied Sapsucker	630,000	20	<0.01

* State-wide population estimates were obtained from the Partners in Flight database as well as through consultation with the NYSDEC.

Table 3.3 Proposed statewide annual lethal removal that is less than 1% of the population data for game species in New York.

Species	NYS Population Estimate*	Average NYS CBC 2012-2016†	Proposed WS Take	WS Proposed Annual Removal as Percent of Population
American Black Duck	10,000	-	50	0.5
Atlantic Brant	-	30,536	250	0.82
Blue-winged Teal	5,500	-	20	0.36
Common Merganser	15,000	-	20	0.13
Crow (American or Fish)[1]	550,000	-	1,100	0.20
Greater Snow Goose	-	125,780	100	0.08
Hooded Merganser	13,500	-	20	0.15
Mallard	170,000	-	250	0.14
Ring-necked Pheasant	15,000	-	20	0.13
Ruddy Duck	-	6,735	40	0.59
Wild Turkey	180,000	-	250	0.14
Wood Duck	100,000	-	20	0.02

* State-wide population estimates were obtained from the Partners in Flight database as well as through consultation with the NYSDEC.

† The Christmas Bird Count data used is the average count from the 2012-2016 survey periods.

[1] American crows and fish crows are analyzed together as they are difficult to distinguish from one another without hearing their calls. Additionally, American crows and fish crows can be removed under depredation order 50 CFR 21.43 by any entity without a depredation permit when found to be causing damage or posing a risk to human health and safety.

Species Analyzed in Detail

Bald Eagle Biology and Population Impacts

WS' proposed annual nest removal:

- Up to **5**

Bald eagle population statistics:

- Mid-Atlantic Population Estimate: **8,244**
- Christmas Bird Count average for New York from 2012-2016: **457**
- BBS New York population trend change from 1966-2015: **+15.84%**
- BBS Eastern Region population trend change from 1966-2015: **+8.32%**

Impacts to bald eagle population:

- WS highest yearly dispersal from FY 2013-FY 2017: **6**
- Statewide number of territorial breeding pairs authorized by USFWS for incidental/unintentional disturbance[*,1]: **4**
- Number of harassment permits in effect for some or all of a year in New York for all entities[*]: **9**

*Highest yearly amount from 2013-2017 as permitted by USFWS.

[1]USFWS designates a disturbance of a nesting pair as equivalent to a loss of 1.33 bald eagles, although this number does necessarily represent a realized level of loss.

The bald eagle is a large raptor easily identified by its distinctive white head and tail (Buehler 2000). During the migration period, eagles can be found throughout the U.S. (Buehler 2000). Bald eagles breed primarily in Alaska and Canada; however, they have been documented nesting in all of the 48 contiguous states (Buehler 2000). Bald eagles are primarily associated with aquatic habitats and open water (Buehler 2000).

There were steep declines of bald eagle populations in the lower U.S. during the early 1900s which has been attributed to the loss of nesting habitat, hunting, poisoning, and pesticide contamination. To curtail steep declining trends in bald eagles, the Bald Eagle Protection Act was passed 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. According to the International Union for Conservation of Nature, the bald eagle is currently classified as a *least concern* species (IUCN 2017). 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.

The number of bald eagles observed in New York has shown a dramatic increasing trend from 1966 to 2015 according to the Breeding Bird Survey, with a 15.84% population increase. The CBC also shows healthy population sizes with greatest number of birds observed during the CBC in New York from 2012-2016 was 528 in 2016, with an average of 457 observed (NAS 2018*b*). In 2010, there were an estimated 173 breeding pairs of bald eagles that produced 244 fledglings in New York. Additionally, bald eagles in New York increase their reproductive success rate by about 10% each year (NYSDEC 2018). The USFWS estimates that the mid-Atlantic population of bald eagles is 8,244 (USFWS 2016).

As was discussed in Chapter 1, under the Bald and Golden Eagle Protection Act, the definition of "*take*" includes actions that "*molest*" or "*disturb*" eagles. For the purposes of the Act, under 50 CFR 22.3, the term "*disturb*" as it related to take has been defined as "*to agitate or bother a bald…eagle 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 Bald and Golden Eagle Protection Act allows the USFWS to permit the take of eagles when "*necessary for the protection of…other interests in any locality*" after determining the take is "*compatible with the preservation of the bald eagle*" (16 U.S.C. 668a).

The USFWS developed an EIS that evaluated alternatives and issues associated with regulations establishing new permits for the take of eagles pursuant to the Act. The preferred alternative in the EIS evaluated the management on an eagle management unit level (similar to the migratory bird flyways) to establish limits on the amount of eagle take that the USFWS could authorize in order to maintain stable or increasing populations. This alternative further establishes a maximum duration for permits of 30 years with evaluations in five year increments (USFWS 2016). A Record of Decision was issued for the preferred alternative in the EIS. The selected alternative revised the permit regulations for the "take" of eagles (see 50 CFR 22.26 as amended) and a provision to authorize the removal of eagle nests (see 50 CFR 22.27 as amended). The USFWS published a Final Rule on December 16, 2016 (81 FR 91551-91553).

WS has previously responded to threats associated with bald eagles at or near airports. The large body size and soaring behavior of eagles can pose threats of aircraft strikes when eagles occur in close proximity to airports. WS used nonlethal methods to disperse six bald eagles at airports in 2017. No eagle harassment occurred the previous four years.

Direct, Indirect, and Cumulative Effects:

Given the definition of "*molest*" and "*disturb*" under the Act as described above, the use of harassment methods to disperse eagles posing threats at or near airports could constitute "*take*" as defined under the Act and therefore requires a permit from the USFWS. WS would only employ harassment methods to disperse a bald eagle from airports or surrounding areas when authorized under a permit issued by the USFWS pursuant to the Act. Therefore, if no permit is issued by the USFWS to harass bald eagles that are posing a threat of aircraft strike, no harassment would be conducted by WS. WS considered local populations of bald eagles, and determined that there will be no impact on those local populations.

Nest removal and destruction would have little adverse impact on the population. Although there may be reduced fecundity for the individuals affected by nest destruction, this activity has no long term effect on breeding adults. The destruction of up to five nests by WS would not reach a level where adverse effects on eagle populations would occur.

No lethal take of bald eagles would occur under this proposed action alternative. WS would abide by all measures and stipulations provided by the USFWS in permits issued for the harassment of bald eagles at airports to reduce aircraft strikes. The USFWS fully evaluated and determined that the issuance of permits for harassment of eagles to WS or other entities would have no significant impacts in a separate analysis (USFWS 2016). Therefore when conducted under a permit issued by USFWS, harassment of bald eagles by WS is not expected to create significant direct, indirect, or cumulative effects to bald eagle populations.

Black Vulture Biology and Population Impact Analysis

WS' proposed annual removal:

- Up to **750**

Black vulture population statistics:

- USFWS Region 5[1] population estimate: **281,017**
- Christmas Bird Count average for New York from 2012-2016: **265**
- BBS Eastern Region population trend change from 1966-2015: **+3.8%**

Impacts to black vulture population:

- WS proposed removal as percent of USFWS Region 5[1] population: **0.27%**
- Non-WS authorized take[*]: **40**
- Cumulative removal as percent of Region 5 population: **0.28%**

[1] USFWS Region 5 is the northeastern region of the US including the following states and districts: Connecticut, Delaware, District of Columbia, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, Virginia, and West Virginia.
*Highest authorized annual take from 2013-2017 for entities other than Wildlife Services as permitted by USFWS.

Historically in North America, black vultures occurred in the southeastern United States, Texas, Mexico, and parts of Arizona (Wilbur 1983). Black vultures have been expanding their range northward in the eastern United States (Wilbur 1983, Rabenhold and Decker 1989), and they are considered locally resident with little movement during the migration periods (Parmalee and Parmalee 1967, Rabenhold and Decker 1989); however, some populations will migrate (Eisenmann 1963). Black vultures can be found in virtually all habitats but are most abundant where forest is interrupted by open land (Buckley 1999). Black vultures typically feed by scavenging, but occasionally take live prey, especially newborn livestock (Brauning 1992). This species has been reported to live up to 25 years of age (Henny 1990).

There are no current reliable population estimates available for the number of black vultures residing within New York; however the USFWS Region 5 population estimate for black vultures is 281,017 (Zimmerman et al. 2019). According to the International Union for Conservation of Nature, the black vulture is classified as a *least concern* species (IUCN 2017). The number of black vultures observed in the eastern BBS region increased at an annual rate of 3.8% (Sauer et al. 2017). Christmas Bird Count Data from 1966 to 2015 indicates a general increasing trend for black vultures wintering in New York (NAS 2018*b*). Black vulture observations are becoming more numerous in New York State. Similar to other states that have experienced the northward range expansion, New York has also noted an increase in black vulture conflicts (USDA 2017). Black vultures were recorded as "confirmed" during the second New York Breeding Bird Atlas and are well established in the state (McGowan and Corwin 2008). In New York, black vultures can be observed most often in the southeastern section of the state, but they are difficult to accurately count.

In the past five years, WS removed 40 vultures in one year. According to USFWS data, the highest authorized annual removal over the last five years by non-WS entities was 40 birds. This number, in addition to the WS proposed removal, was used to assess the cumulative removal.

Direct, Indirect, and Cumulative Effects:

Direct operational assistance conducted by WS on black vultures could occur at any time of the year. However, if assistance occurs in the spring, there could be an impact on the nesting and/or breeding success of individuals that are in close proximity to that area; this localized impact would be minimal and therefore would not cause adverse indirect effects on the state black vulture population. There has been a 3.8% increase in black vulture populations in the eastern region since 1966. Based on the best scientific data, WS proposed annual removal of 750 black vultures would equal 0.0038% of the global population, and therefore will have no adverse direct effects on black vulture global populations.

WS does not expect there to be adverse cumulative impacts on black vulture populations from WS proposed removal combined with the potential authorized removal from all non-WS entities. The cumulative removal of black vultures by all entities in New York including WS represents 0.28% of the global population. The removal of black vultures can only occur when authorized through the issuance of depredation permits by the USFWS.

Double-Crested Cormorant Biology and Population Impacts

WS' proposed annual removal:

- Up to **2,000 birds**
- Up to **500 nests**

Double-crested cormorant population statistics:

- New York population estimate: **43,000**
- Christmas Bird Count average for New York from 2012-2016: **856**
- BBS New York population trend change from 1966-2015: **+18.65%**
- BBS Eastern Region population trend change from 1966-2015: **+4.17%**

Impacts to double-crested cormorant population:

- WS proposed removal as percent of New York population: **4.65%**
- Non-WS authorized take*: **990**

- Cumulative removal as percent of population: **6.95%**

*Highest authorized annual take from 2013-2017 for entities other than Wildlife Services as permitted by USFWS.

Double-crested cormorants are large fish-eating colonial waterbirds widely distributed across North America (Hatch and Weseloh 1999). The double-crested cormorant is one of six species of cormorants breeding in North America and has the widest range (Hatch 1995). Double-crested cormorants range throughout North America (Cornell Lab of Ornithology 2015). Cormorants are most commonly found in New York during the spring, summer, and fall months when the breeding and migrating populations are present, with peak migration numbers occurring in April and October (Wires et al. 2010). Breeding populations of cormorants in New York occur mostly on Lake Champlain, the Great Lakes, and the greater New York City/ Long Island area.

The New York population of double-crested cormorants was estimated to be approximately 43,000 individuals (NYSDEC 2016). Double-crested cormorants increased in population throughout the eastern region of the United States by 4.17% since 1966. This increase is apparent in New York with an estimated population growth of 18.65% from 1966-2015 throughout the state (BBS 2017). CBC data has corroborated the healthy population status of double-crested cormorants throughout New York, with an average CBC count of 856 individuals counted in the state from 2012-2016. Wires et al. (2010) and Jackson and Jackson (1995) have suggested that the current cormorant resurgence may be, at least in part, a population recovery following years of DDT-induced reproductive suppression and unregulated take prior to protection under the MBTA. According to the International Union for Conservation of Nature, the double-crested cormorant is classified as a *least concern* species (IUCN 2017).

Double-crested cormorants are protected under the MBTA. However, take can occur pursuant to the MBTA through depredation permits issued by the USFWS. Take of double-crested cormorants in New York can therefore occur under this depredation order, under USFWS permits issued to WS, and under permits issued to other entities.

The number of double-crested cormorants addressed in New York by all entities to alleviate damage is shown in Table 3.4. According to USFWS data, the highest authorized annual removal over the last five years by non-WS entities was 990 birds. This number, in addition to the WS proposed removal, was used to assess the cumulative removal.

Table 3.4 Number of double-crested cormorants taken by WS and other entities in New York from FY 2013 - FY 2017.

	Removal under Depredation Permits	
	WS' Permit[1,2]	Other Entities' Permits[2]
Year		
2013	0 + 0 nests	279 + 7 nests
2014	0 + 0 nests	203 + 10 nests
2015	0 + 0 nests	275 + 24 nests
2016	159 + 0 nests	530 + 48 nests
2017	219 + 47 nests	162 + 0 nests
Average	75.6 + 9.4 nests	289.8 + 17.8 nests

[1]WS' removal under a depredation permit issued to WS in New York; additional removals by WS under permits held by cooperators are reflected as a component of the Other Entities' Permits.
[2]Data reported by USFWS by calendar year.

Direct, Indirect, and Cumulative Effects:

Based on the best scientific data, WS proposed removal level of 2,000 double-crested cormorants would only represent 4.65% of the New York population, and will have no adverse direct effects on double-crested cormorant populations. However, if assistance occurs in the spring, there could be an impact on the nesting and/or breeding success of individuals that are in close proximity to that area. This localized impact would be minimal and therefore would also not cause adverse indirect effects on the statewide double-crested cormorant populations. Additionally, the combination of WS take and take by other entities would equal 6.95% of the New York population, and is therefore not expected to have any cumulative effects on double-crested cormorant populations. Additionally, these impact analyses represent the effects of management practices on estimated breeding individuals only, and exclude juvenile and non-breeding adults. Therefore,

the impact analyses are based on a conservative population estimate, and the direct, indirect, and cumulative impacts are likely less.

The removal and destruction of nests should have little adverse impact on the population. Although this method may reduce the fecundity of individual birds, nest destruction has no long term effect on populations. The removal of up to 500 double-crested cormorant nests annually by WS would occur in localized areas where nesting takes place and would not reach a level where adverse effects on cormorant populations would occur. As with the lethal take of adults, the removal of nests must be authorized by the USFWS. Therefore, the number of nests taken by WS annually would occur at the discretion of the USFWS.

European Starling Biology and Population Impacts

WS' proposed annual removal:

- Up to **250,000**

European starling population statistics:

- New York population estimate: **2,600,000**
- Christmas Bird Count average for New York from 2012-2016: **140,426**
- BBS New York population trend change from 1966-2015: **-2.04%**
- BBS Eastern Region population trend change from 1966-2015: **-1.53%**

Impacts to European Starling population:

- WS proposed removal as percent of New York population: **9.62%**

The European starling is an Old World passerine species introduced in the eastern U.S. in the late 1800's. Starlings are found year-round throughout New York (Cornell Lab of Ornithology 2015). Starlings nest in cavities and will readily evict most native hole-nesting species. In the absence of natural cavities, they will nest in almost any enclosed area such as a street light, a mail box, or an attic (Brauning 1992).

According to the International Union for Conservation of Nature, the European starling is classified as a *least concern* species (IUCN 2017). European starlings are considered a non-native species in New York and are afforded no protection under the MBTA. Therefore, no depredation permits, from either the USFWS or the NYSDEC, are needed for the removal of starlings. The number of starlings lethally removed by other entities to alleviate damage or threats is unknown since reporting starling removal is not required. The number of starlings dispersed and lethally removed by WS from FY 2013 through FY 2017 are listed in Table 3.5. 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.

Table 3.5 Number of European starlings dispersed and removed by WS in New York from FY 2013 to FY 2017. These totals include birds taken under WS' permit and other entities' permits.

Year	Dispersed by WS[1]	Removed by WS[1]
2013	936,886	64,289
2014	664,313	22,372
2015	1,059,955	42,600
2016	633,327	29,747
2017	1,770,536	31,553
Average	1,013,003	38,112

[1]Data reported by federal fiscal year.

Direct, Indirect, and Cumulative Effects:
WS' removal of European starlings to reduce damage and threats would be in compliance with Executive Order 13112. Since European starlings compete with native wildlife species for resources, any take could be viewed as benefitting the natural environment. Additionally, this species is highly adaptable to changes in the environment, which allows for rapid population recovery. WS' proposed removal level will have no adverse direct or indirect effects on European starling populations in New York. While non-WS removal is unknown, starling populations have historically expanded their range throughout North America and are considered a non-native species. Therefore, WS does not anticipate any significant cumulative impacts to starling populations in New York.

Feral Waterfowl Biology and Population Impacts

WS' proposed annual removal:

- Up to **50**
- Up to **20 nests**

Feral waterfowl population statistics:

- This information is unavailable as these species are not monitored by USFWS or other entities

Feral waterfowl refers to captive-reared, domestic, of some domestic genetic stock, or domesticated breeds of ducks, geese, and swans. Examples of domestic waterfowl include, but are not limited to, Muscovy ducks, Pekin ducks, Rouen ducks, Cayuga ducks, Swedish ducks, Chinese geese, Toulouse geese, Khaki Campbell ducks, Embden geese, and pilgrim geese. Feral ducks may include a combination of mallards, Muscovy ducks, and mallard-Muscovy hybrids. All domestic ducks, except for Muscovy ducks, were derived from the mallard (Drilling et al. 2002).

Many waterfowl of domestic or semi-wild genetic backgrounds have been released by humans into rural and urban environments, including numerous species of ducks, geese, and swans. Selective breeding has resulted in the development of numerous domestic varieties of the mallard duck that no longer exhibit the external characteristics or coloration of their wild mallard ancestors.

Domestic waterfowl have been purchased and released by property owners for their aesthetic value, but those released waterfowl may not always remain at the release sites; thereby, becoming feral. Feral waterfowl are defined as a domestic species of waterfowl that cannot be linked to a specific ownership. Examples of areas where domestic waterfowl have been released are business parks, universities, wildlife management areas, parks, military bases, residential communities, and housing developments. Many times, those birds are released with no regard or understanding of the consequences or problems they can cause to the environment or the local community.

Federal law does not protect domestic varieties of waterfowl (see 50 CFR 21), nor are domestic waterfowl specifically protected by state law in New York. Domestic waterfowl may at times cross breed with migratory waterfowl species, creating a hybrid cross breed (e.g., mallard X domestic duck, Canada goose X domestic goose). Those types of hybrid waterfowl species would be taken in accordance with definitions and regulations provided in 50 CFR 10 and 50 CFR 21.

Domestic ducks, geese, and swans are non-indigenous species considered by many wildlife biologists and ornithologists to be an undesirable component of native ecosystems in North America. Any reduction in the number of these domestic waterfowl species could be considered as benefiting other native bird species since they compete with native wildlife for resources. Domestic and feral waterfowl are almost always found near water, such as ponds, lakes, retaining pools, and waterways. Domestic and feral waterfowl generally reside in the same area year-round with little to no migration occurring. Currently, population estimates do not exist for domestic and feral waterfowl in New York.

The Muscovy ducks located in New York are from non-migratory populations that originated from domestic stock. The USFWS has recently changed the regulations governing Muscovy ducks. Because Muscovy ducks occur naturally in southern Texas, this species has been added to the list of migratory birds afforded protection under the MBTA. However, it has been introduced and is not native in other parts of the United States, including New York. The USFWS now

prohibits sale, transfer, or propagation of Muscovy ducks for hunting and any other purpose other than food production, and allows their removal in locations in which the species does not occur naturally in United States, including New York. The USFWS has revised 50 CFR 21.14 (permit exceptions for captive-bred migratory waterfowl other than mallard ducks) and 50 CFR 21.25 (waterfowl sale and disposal permits), and has added 50 CFR 21.54, which is an order to allow control of Muscovy ducks, their nests, and eggs.

From FY 2013 through FY 2017, the WS program in New York did not remove any feral waterfowl from the environment. Although no specific hunting season has been designated specifically for feral waterfowl, some domestic or feral waterfowl are taken during the annual hunting season for free-ranging waterfowl.

Direct, Indirect, and Cumulative Effects:
Based on previous requests for assistance and in anticipation of additional efforts, WS could lethally remove up to 50 feral waterfowl. Additionally, up to 20 feral waterfowl nests could be destroyed annually under the proposed action. Since feral waterfowl often compete with native wildlife species for resources, any take of feral waterfowl could be viewed as benefitting the natural environment. The number of feral waterfowl inhabiting New York is currently unknown. However, based on the limited take proposed the lethal removal of up to 50 feral waterfowl would not adversely affect populations of those feral species.

Glossy Ibis Biology and Population Impacts

WS' proposed annual removal:

- Up to **75**

Glossy ibis population statistics:

- Global population estimate: **820,000**
- BBS Eastern Region population trend change from 1966-2015: **+4.24%**

Impacts to glossy ibis population:

- WS proposed removal as percent of global population: **0.009%**
- Non-WS authorized take*: **5**
- Cumulative removal as percent of population: **0.01%**

*Highest authorized annual take from 2013-2017 for entities other than WS as permitted by USFWS.

Glossy ibises are wading birds that can be found along the Atlantic coastline of the United States at different points of the year (NAS 2018*a*). These birds breed in coastal regions of New York State, including the greater New York City and Long Island region (Cornell Lab of Ornithology 2015). Glossy Ibises nest in shrubs or small trees, or on the ground level of islands.

There are no current population estimates for glossy ibises in New York; however, there is a global population estimate of 820,000 birds (Cornell Lab of Ornithology 2015). The BBS Eastern Region shows an increasing glossy ibis population trend since 1966. According to the International Union for Conservation of Nature, the glossy ibis is classified as a *least concern* species (IUCN 2017).

There were no glossy ibises removed by WS in New York from 2013 to 2017, and, according to USFWS data, there were 16 glossy ibises removed in New York by other entities during this timeframe. The USFWS data reports that the highest authorized annual removal over the last five years by non-WS entities was five birds. This number, in addition to the WS proposed removal, was used to assess the cumulative removal.

Direct, Indirect, and Cumulative Effects:
The removal of 75 glossy ibises by WS would represent 0.009% of the global population estimate of glossy ibises. Since this is only a fraction of a percent, WS proposed removal level is expected to have no adverse direct or indirect effects on

glossy ibis populations. The cumulative removal by all entities in New York, including WS, would represent 0.01% of the global population estimate. Therefore, the potential authorized removal from all non-WS entities combined with WS proposed removal is also not expected to create adverse cumulative impacts.

Great Blue Heron Biology and Population Impacts

WS' proposed annual removal:

- Up to **50**
- Up to **20 nests**

Great blue heron population statistics:

- North American continental population estimate: **83,000**
- Christmas Bird Count average for New York from 2012-2016: **674**
- BBS New York population change from 1966-2015: **+1.33%**
- BBS Eastern Region population trend change from 1966-2015: **+0.33 %**

Impacts to great blue heron population:

- WS proposed removal as percent of continental population: **0.06%**
- Non-WS authorized take*: **165**
- Cumulative removal as percent of continental population: **0.26%**

*Highest authorized annual take from 2013-2017 for entities other than WS as permitted by USFWS.

The great blue heron is the largest heron in North America (NAS 2018*a*). This common widespread wading bird can be found throughout most of North America and can be found year-round in most of the United States (Vennesland and Butler 2011). Great blue herons feed in both fresh and saltwater wetlands, and need pristine, undisturbed locations in order to breed (Cornell Lab of Ornithology 2015).

There are no current population estimates for great blue herons in the state of New York. The continental population estimate of great blue herons is 83,000 (Cornell Lab of Ornithology 2015). According to the International Union for Conservation of Nature, the great blue heron is classified as a *least concern* species (IUCN 2017). The New York and Eastern Region BBS both show population increases between 1966 and 2015.

The number of great blue herons addressed in New York by all entities to alleviate damage is shown in Table 3.6. According to USFWS data, the highest authorized annual removal over the last five years by non-WS entities was 165 birds. This number, in addition to the WS proposed removal, was used to assess the cumulative removal.

Table 3.6 Number of great blue herons removed by WS and other entities in New York from FY 2013 - FY 2017.

	Removal under Depredation Permits	
	WS' Permits [1,2]	Other Entities'Permits[2]
Year		
2013	0	33
2014	0	50
2015	0	51
2016	0	44
2017	0	30
Average	0	41.6

[1]WS' removal under a depredation permit issued to WS in New York; additional removals by WS under permits held by cooperators are reflected as a component of the Other Entities' Permits.
[2]Data reported by USFWS by calendar year.

Direct, Indirect, and Cumulative Effects:
The removal of 50 great blue herons by WS would represent 0.06% of the continental population estimate of 83,000 individuals (Cornell Lab of Ornithology 2015). Since this is only a fraction of a percent, WS proposed removal level is expected to have no adverse direct or indirect effects on great blue heron populations. The cumulative removal by all entities in New York, including WS, would represent 0.26% of the continental population estimate. Therefore, the potential authorized removal from all non-WS entities combined with WS proposed removal is also not expected to create adverse cumulative impacts.

Great Egret Biology and Population Impacts

WS' proposed annual removal:

- Up to **50**
- Up to **20 nests**

Great egret population statistics:

- North American continental population estimate: **180,000**
- BBS New York population trend change from 1966-2015: **+2.46%**
- BBS Eastern Region population trend change from 1966-2015: **+0.39%**

Impacts to great egret population:

- WS proposed removal as percent of continental population: **0.028%**
- Non-WS authorized take*: **25**
- Cumulative removal as percent of continental population: **0.042%**

*Highest authorized annual take from 2013-2017 for entities other than WS as permitted by USFWS.

Great egrets can be found across the United States along the Atlantic, Pacific, and Gulf coasts and in major river drainages wherever suitable habitat is available (McCrimmon et al. 2011). Great egrets can be observed in a variety of wetland habitats. Great egrets are local summer residents that nest in small numbers throughout the greater New York City/Long Island area as well as the Great Lakes, Hudson Valley, and Finger Lakes regions of the state.

The overharvest of great egrets that occurred primarily from 1870 to 1910 for plumes and the millinery trade reduced the population in North America by >95% (McCrimmon et al. 2011). During surveys conducted in 1911 and 1912, the total known nesting population of great egrets was estimated at 1,000 to 1,500 breeding pairs in 13 colonies in seven states (McCrimmon et al. 2011). Following regulations that ended plume-hunting, great egret populations rapidly recovered with increases reported as early as the late 1920s and 1930s (McCrimmon et al. 2011). Indeed, there has been an increasing trend in great egret populations of 0.39% in the eastern region of the United States, and an even larger increase of 2.46% in the state of New York (BBS 2017). The North American continental population is estimated at 180,000 birds (Cornell Lab of Ornithology 2015) and according to the International Union for Conservation of Nature, the great egret is classified as a *least concern* species (IUCN 2017).

Great egrets are a common bird species that can cause damage to aquaculture resources and are also occasional visitors to airports where they can pose an aircraft strike risk. Therefore, the WS program could receive requests for assistance associated with great egrets in or around New York State. There were no great egrets removed in New York by WS from FY 2013 to FY 2017. According to the USFWS data, there were no great egrets removed in New York by other entities during this same time. The USFWS data shows that the highest authorized annual removal over the last five years by non-WS entities was 25 birds. This number, in addition to the WS proposed removal, was used to assess the cumulative removal.

Direct, Indirect, and Cumulative Effects:
Based on the best scientific data, and given an increasing population trend of 2.46% in New York from 1966-2015, WS' proposed removal level will have no adverse direct effects on great egret populations. WS' proposed take of up to 50

individuals would constitute only 0.028% of the continental population. Direct operational assistance conducted by WS on great egrets could occur anytime of the year in New York; however, if assistance occurs in the spring, there could be an impact on the nesting and/or breeding success of individuals that are in close proximity to that area; this localized impact would be minimal and therefore would also not cause adverse indirect effects on the statewide great egret populations.

WS does not expect there to be adverse cumulative impacts on great egret populations from WS proposed removal combined with the potential authorized removal from all non-WS entities. The combined removal of WS' proposed amount (50) and other non-WS entities highest authorized amount (25) represents only 0.042% of the continental population.

Gull Biology and Population Impact Analysis

Great Black-backed Gull Biology and Population Impact Analysis

WS' proposed annual removal:

- Up to **300**
- Up to **300 nests**

Great black-backed gull population statistics:

- North American continental population estimate: **122,000**
- Christmas Bird Count average for New York from 2012-2016: **5,353**
- BBS New York population trend change from 1966-2015: **+5.33%**
- BBS Eastern Region population trend change from 1966-2015: **-5.81%**

Impacts to great black-backed gull population:

- WS proposed removal as percent of continental population: **0.25%**
- Non-WS authorized take*: **1,695**
- Cumulative removal as percent of continental population: **1.63%**

*Highest authorized annual take from 2013-2017 for entities other than WS as permitted by USFWS.

The great black-backed gull is the world's largest gull, and is plentiful on the east coast of the United States. During the non-breeding season, great black-backed gulls can be found along the Atlantic coast from Florida north into the Gulf of Saint Lawrence and inland across New England, New York, and Pennsylvania to the Great Lakes (Good 1998). Additionally, great black backed gulls can be observed year round in coastal portions of New York State (Cornell Lab of Ornithology 2015).

The population of great black-backed gulls in North America has been estimated at 122,000 (Nisbet et al. 2013). In the New York State BBS, great-black backed gulls showed an increasing population trend from 1966-2015. According to the International Union for Conservation of Nature, the great-blacked back gull is classified as a *least concern* species (IUCN 2017).

The number of great black-backed gulls addressed in New York by all entities to alleviate damage is shown in Table 3.7. According to USFWS data, the highest authorized annual removal over the last five years by non-WS entities was 1,695 birds. This number, in addition to the WS proposed removal, was used to assess the cumulative removal.

Table 3.7 Number of great black-backed gulls removed by WS and other entities in New York from FY 2013 - FY 2017.

	Removal under Depredation Permits	
	WS' Permits[1,2]	Other Entities Permits[2]
Year		
2013	7 + 7 nests	101 + 58 nests
2014	16 + 0 nests	98 + 23 nests
2015	0 + 3 nests	113 + 28 nests
2016	0 + 1 nest	101 + 2 nests
2017	10 + 5 nests	94 + 0 nests
Average	6.6 + 3.2 nests	101.4 + 22.2 nests

[1]WS' removal under a depredation permit issued to WS in New York; additional removals by WS under permits held by cooperators are reflected as a component of the Other Entities' Permits.
[2]Data reported by USFWS by calendar year.

Direct, Indirect, and Cumulative Effects:
Based on the population estimate of 122,000, the annual removal of up to 300 great black-backed gulls by WS under the proposed action alternative would represent 0.25% of the population. Based on the best scientific data and since great black-backed gulls are considered a species of low concern, WS proposed removal level will have no adverse direct or indirect effects on great black-backed gull populations. The cumulative removal only represents 1.63% of the population; therefore, the potential authorized removal from all non-WS entities combined with WS proposed removal is also not expected to create adverse cumulative impacts.

Impacts due to the authorized removal of up to 300 nests should have little adverse direct or indirect impacts on the great black-backed gull population. For the majority of the state, great black-backed gulls are only present during nonbreeding season. However, for the coastal areas where these birds are present year-round, WS may need to remove some nests. Great black-backed gulls are a long-lived species and have the ability to identify areas with regular human disturbance and low reproductive success, which could cause them to relocate and nest elsewhere when confronted with repeated nest failures. Although there may be reduced fecundity for the individual great black-backed gulls affected by nest destruction, this activity has no long term effect on breeding adult great black-backed gulls. This method would be used by WS to inhibit nesting in an area experiencing damage due to nesting activity and would be intended to disperse a nesting pair or colony of great black-backed gulls to an area where there were no conflicts. The removal of nests must be authorized by the USFWS. Therefore, the number of nests destroyed by WS annually would occur at the discretion of the USFWS and in consultation with the NYSDEC.

Herring Gull Biology and Population Impact Analysis

WS' proposed annual removal:

- Up to **2,500**
- Up to **2,000 nests**

Herring gull population statistics:

- North American continental population estimate: **246,000**
- Christmas Bird count average for New York from 2012-2016: **39,416**
- BBS New York population trend change from 1966-2015: **-1.89%**
- BBS Eastern Region population trend change from 1966-2015: **-3.51%**

Impacts to herring gull population:

- WS proposed removal as percent of continental population: **1.02%**
- Non-WS authorized take*: **5,020**
- Cumulative removal as percent of population: **3.06%**

*Highest authorized annual take from 2013-2017 for entities other than WS as permitted by USFWS.

Herring gulls are the most common gulls in the Northeastern United States (Pierotti and Good 1994). In the northeast, herring gulls nest along the Great Lakes and along the Atlantic Coast (Pierotti and Good 1994), or near lakes in the northern forests of the Northeast, as well across Canada and Alaska (Cornell Lab of Ornithology 2015). In addition to the herring gulls that are present during breeding season, herring gulls can be found wintering across the state of New York (Cornell Lab of Ornithology 2015).

The current population of herring gulls in North America is estimated at more than 246,000 breeding individuals (Cornell Lab of Ornithology). The average number of herring gulls observed in areas surveyed in the state during the CBC from 2012-2016 is 39,416 birds. According to the International Union for Conservation of Nature, the herring gull is classified as a *least concern* species (IUCN 2017).

The number of herring gulls addressed in New York by all entities to alleviate damage is shown in Table 3.8. According to USFWS data, the highest authorized annual removal over the last five years by non-WS entities was 5,020 birds. This number, in addition to the WS proposed removal, was used to assess the cumulative removal.

Table 3.8 Number of herring gulls removed by WS and other entities in New York from FY 2013 to FY 2017.

	Removal under Depredation Permits	
Year	WS' Permits[1,2]	Other Entities' Permits [2]
2013	389 + 644 nests	1,009 + 65 nests
2014	785 + 652 nests	1,811 + 5 nests
2015	695 + * nests	1,458 + 19 nests
2016	393 + 710 nests	1,397 + 19 nests
2017	200 + 790 nests	765 + 12 nests
Average	492.4 + 699 nests	1,288 + 24 nests

[1]WS' removal under a depredation permit issued to WS in New York; additional removals by WS under permits held by cooperators are reflected as a component of the Other Entities' Permits.
[2]Data reported by USFWS by calendar year.

Direct, Indirect, and Cumulative Effects:
WS proposed removal of 2,500 herring gulls would represent 1.02% of the continental population of herring gulls. Additionally, this proposed take would represent 6.34% of the average CBC from 2012-2016, although data from the CBC provides an indication of long-term trends in the number of birds observed wintering in the state and is not representative of estimates for wintering bird populations. Given the low magnitude of this proposed removal level and the fact that WS would only remove herring gulls at the discretion of the USFWS through a depredation permit, WS proposed removal level is not expected to create significant adverse direct or indirect effects on herring gull populations.

The highest combined authorized removal by non-WS entities in addition to WS' proposed removal would represent 3.06% of the continental population. The removal of herring gulls can only occur when permitted by the USFWS through the issuance of depredation permits.

Additionally, impacts due to the authorized removal of up to 2,000 nests should have little adverse direct or indirect impacts on the herring gull population. Herring gulls are a long-lived species and have the ability to identify areas with regular human disturbance and low reproductive success, which could cause them to relocate and nest elsewhere when confronted with repeated nest failures. Although there may be reduced fecundity for the individual herring gulls affected by nest destruction, this activity has no long term effect on breeding adult herring gulls. This method would be used by WS to inhibit nesting in an area experiencing damage due to nesting activity and would be intended to disperse a nesting pair or colony of herring gulls to an area where there were no conflicts. The removal of nests must be authorized by the USFWS. Therefore, the number of nests destroyed by WS annually would occur at the discretion of the USFWS.

Laughing Gull Biology and Population Impact Analysis

WS' proposed annual removal:

- Up to **3,750**
- Up to **150 nests**

Laughing gull population statistics:

- Global population estimate: **570,000**
- BBS Eastern Region population trend change from 1966-2015: **+1.90%**

Impacts to laughing gull population:

- WS proposed removal as percent of global population: **0.66%**
- Non-WS authorized take*: **8,650**
- Cumulative removal as percent of population: **2.18%**

*Highest authorized annual take from 2013-2017 for entities other than WS as permitted by USFWS.

In the United States, laughing gulls can be found from Maine south along the Atlantic and Gulf coasts during the breeding season and from North Carolina south along the Atlantic and Gulf coast during the rest of the year (Burger 2015). Laughing gulls are known to cause damage or threats of damage at landfills and airports (Burger 2015).

According to the International Union for Conservation of Nature, the laughing gull is classified as a *least concern* species (IUCN 2017). The global population for laughing gulls is estimated at 570,000 (Cornell Lab of Ornithology 2015). The BBS Eastern region shows a 1.90% increase in population from 1966-2015.

The number of laughing gulls addressed in New York by all entities to alleviate damage is shown in Table 3.9. According to USFWS data, the highest authorized annual removal between 2013 and 2017 for non-WS entities was 8,650 birds. This number, in addition to the WS proposed removal, was used to assess the cumulative removal.

Table 3.9 Number of laughing gulls removed by WS and other entities in New York from FY 2013 to FY 2017.

	Removal under Depredation Permits	
Year	WS' Permits[1,2]	Other Entities Permits[2]
2013	1 + 0 nests	1,510 + 0 nests
2014	0 + 0 nests	998 + 0 nests
2015	0 + 0 nests	1,212 + 0 nests
2016	0 + 0 nests	2,739 + 0 nests
2017	0 + 0 nests	1,300 + 0 nests
Average	0.2 + 0 nests	1,552 + 0 nests

[1]WS' removal under a depredation permit issued to WS in New York; additional removals by WS under permits held by cooperators are reflected as a component of the Other Entities' Permits.
[2]Data reported by USFWS by calendar year.

Direct, Indirect, and Cumulative Effects:

The annual removal of up to 3,750 laughing gulls by WS under the proposed action alternative would represent 0.66% of the global population. Based on the best scientific data as well as the increasing Eastern Region BBS population trend, WS proposed removal level will have no adverse direct or indirect effects on laughing gull populations. Additionally, the highest combined authorized removal by non-WS entities in addition to WS' proposed removal would represent 2.18% of the global population of laughing gulls.

Additionally, the removal of 150 laughing gull nests should have little adverse direct or indirect impacts on the laughing gull population. Laughing gulls are a long-lived species that have the ability to identify areas with regular human disturbance and low reproductive success, which can cause those birds to relocate and nest elsewhere when confronted with repeated nest failure. Although there may be reduced fecundity for the individual laughing gulls affected by nest

destruction, this activity has no long term effect on breeding adult laughing gulls. The removal of nests must be authorized by the USFWS. Therefore, the number of nests destroyed by WS annually would occur at the discretion of the USFWS, and would also occur in consultation with NYSDEC.

Ring-billed Gull Biology and Population Impact Analysis

WS' proposed annual removal:

- Up to **2,500**
- Up to **10,000 nests**

Ring-billed gull population statistics:

- North American continental population estimate: **1,180,000**
- Christmas Bird Count average for New York from 2012-2016: **57,000**
- BBS New York population trend change from 1966-2015: **+9.44%**
- BBS Eastern Region population trend change from 1966-2015: **+3.34%**

Impacts to ring-billed gull population:

- WS proposed removal as percent of continental population: **0.21%**
- Non- WS authorized take*: **5,975**
- Cumulative removal as percent of continental population: **0.72%**

*Highest authorized annual take from 2013-2017 for entities other than WS as permitted by USFWS.

Ring-billed gulls are inland nesting gulls that are colonial ground nesters on sparsely vegetated islands in large lakes with occasional colonies on mainland peninsulas and near-shore oceanic islands (Pollet et al. 2012). Ring-billed gull populations have experienced large increases in the last 50 years around the Great Lakes and in some locations, populations have increased to the point that these gulls are considered a pest (Wires et al. 2010, Pollet et al. 2012). The number of ring-billed gulls nesting on Lake Erie increased by 161% from 1976 through 2009 (Morris et al. 2011).

The North American continental population for ring-billed gulls is estimated at 1,180,000 (Nisbet et al. 2013). According to the International Union for Conservation of Nature, ring-billed gulls are classified as a *least concern* species (IUCN 2017). The average number of ring-billed gulls observed in areas surveyed during the CBC from 2012-2016 was 57,000 (NAS 2018*b*). Additionally, the breeding bird survey results exhibit an increasing population trend of 9.44% from 1966-2015 in New York State (BBS 2017).

The number of ring-billed gulls addressed in New York by all entities to alleviate damage is shown in Table 3.10. According to USFWS data, the highest authorized annual removal from 2013 to 2017 for non-WS entities was 5,975 birds. This number, in addition to the WS proposed removal, was used to assess the cumulative removal.

Table 3.10 Number of ring-billed gulls removed by WS and other entities in New York from FY 2013 to FY 2017.

	Removal under Depredation Permits	
	WS' Permits[1,2]	Other Entities' Permits[2]
Year		
2013	831 + 1,787 nests	967 + 790 nests
2014	964 + 3,029 nests	1,838 + 575 nests
2015	541 + 4,101 nests	1,083 + 1,242 nests
2016	606 + 2,369 nests	939 + 212 nests
2017	1,123 + 3,437 nests	369 + 21 nests
Average	813 + 2,944.6 nests	1,039.2 + 568 nests

[1]WS' removal under a depredation permit issued to WS in New York; additional removals by WS under permits held by cooperators are reflected as a component of the Other Entities' Permits.
[2]Data reported by USFWS by calendar year.

Direct, Indirect, and Cumulative Effects:

Based on the best scientific data, WS proposed removal of 2,500 ring-billed gulls will not have significant adverse direct or indirect effects on overall populations. WS proposed removal of 2,500 ring-billed gulls would represent 0.21% of the North American population. The highest combined authorized removal by non-WS entities in addition to WS' proposed removal would represent 0.72% of the continental population. In addition, WS would only remove ring-billed gulls at levels permitted by the USFWS through the issuance of a depredation permit.

Additionally, the removal of 10,000 ring-billed gull nests would have little adverse direct or indirect impacts on the ring-billed gull population. Ring-billed gulls are a long-lived species that have the ability to identify areas with regular human disturbance and low reproductive success, which can cause those birds to relocate and nest elsewhere when confronted with repeated nest failure. Although there may be reduced fecundity for the individual ring-billed gulls affected by nest destruction, this activity has no long term effect on breeding adult ring-billed gulls. The removal of nests must be authorized by the USFWS. Therefore, the number of nests destroyed by WS annually would occur at the discretion of the USFWS, and would also occur in consultation with the NYSDEC.

Killdeer Biology and Population Impacts

WS' proposed annual removal:

- Up to **200**

Killdeer population statistics:

- United States population estimate: **1,000,000**
- BBS New York population trend change from 1966-2015: **-2.28%**
- BBS Eastern Region population trend change from 1966-2015: **-1.62%**

Impacts to killdeer population:

- WS proposed removal as percent of United States population: **0.02%**
- Non- WS authorized take*: **205**
- Cumulative removal as percent of population: **0.04%**

*Highest authorized annual take from 2013-2017 for entities other than WS as permitted by USFWS.

The killdeer is by far the most wide-spread and familiar of North American plovers because of its preferred habitat, its tolerance of humans, its easily observed parental care, and its distinct vocalizations. The killdeer is probably more common today than at any time in its history as a result of habitat changes brought on by humans. They can be found in the open habitats of agricultural fields, parking lots, and sandy or bare ground. The population of killdeer in the United States is estimated to be approximately 1,000,000 birds according to the IUCN (Birdlife International 2016).

According to the International Union for Conservation of Nature, killdeer are classified as a *least concern* species (IUCN 2017). Killdeer are statewide summer residents of New York and have shown a declining population trend of about 2.28% from 1966-2015 (BBS 2017). Although populations exhibit a declining trend, the overall population is extremely large which precludes killdeer from a vulnerable conservation status (Birdlife International 2016).

The number of killdeer addressed in New York by all entities to alleviate damage is shown in Table 3.11. According to USFWS data, the highest authorized annual removal from 2013 to 2017 for non-WS entities was 205 birds. This number, in addition to the WS proposed removal, was used to assess the cumulative removal.

Table 3.11 Number of killdeer removed by WS and other entities in New York from FY 2013 - FY 2017.

	Removal under Depredation Permits	
Year	WS' Permits[1,2]	Other Entities' Permits[2]
2013	0	22

2014	0	3
2015	1	40
2016	0	19
2017	0	78
Average	0.2	32.4

[1]WS' removal under a depredation permit issued to WS in New York; additional removals by WS under permits held by cooperators are reflected as a component of the Other Entities' Permits.
[2]Data reported by USFWS by calendar year.

Direct, Indirect, and Cumulative Effects:
Requests for assistance associated with killdeer occur primarily at airports. WS would continue to assist airport personnel in identifying habitat and other attractants to killdeer on airport property. Killdeer would continue to be addressed using primarily nonlethal harassment and dispersal methods. The removal of 200 killdeer would represent 0.02% of the national population. Based on the best scientific data, WS proposed removal level will have no adverse direct effects on killdeer populations. If habitat modification and nonlethal harassment methods occur within airport property to minimize the attraction of killdeer on the property, then there could be an indirect impact on the nesting and/or breeding success of individuals that originally nested on the airport property; this localized indirect impact would be minimal and therefore would not cause significant effects on the state killdeer populations. The cumulative removal of killdeer by all entities in New York, including WS, would represent 0.04% of the national population estimate. Since this is a fraction of a percent, the potential authorized removal from all non-WS entities combined with WS proposed removal is also not expected to create adverse cumulative impacts.

Mute Swan Biology and Population Impacts

WS' proposed annual removal:

- Up to **250**

Mute swan population statistics:

- New York population estimate: **2,477**
- Christmas Bird Count average for New York from 2012-2016: **1,856**
- BBS New York population trend change from 1966-2015: **+0.68%**
- BBS Eastern Region population trend change from 1966-2015: **+1.79%**

Impacts to mute swan population:

- WS proposed removal as percent of state population: **10.1%**
- WS proposed removal as percent of global population: **0.125%**
- Non-WS authorized take*: 6
- Cumulative removal as percent of population: 10.3**%**

*Highest authorized annual take from 2013-2017 for entities other than WS as permitted by USFWS.

Mute swans were introduced from Europe into the United States in the late 1800's near New York City. Feral breeding took place after 544 more individuals were introduced into the lower Hudson Valley in 1910 and on Long Island in 1912. In the eastern United States, scattered breeding now occurs from New England to Virginia (Cornell Lab of Ornithology 2015). Feral populations became established over time as swans that had escaped or been intentionally released from captivity survived and reproduced in the wild. Mute swans prefer freshwater ponds and streams of 10 acres or less and coastal bays and salt marshes. Eastern birds migrate short distances to coastal bays for the winter. The swan's diet consists mostly of rooted aquatic vegetation. Small islands, narrow peninsulas, and clumps of aquatic vegetation are preferred nesting sites.

According to NYSDEC there are currently 2,477 mute swans throughout the state, mainly occurring in the lower Hudson Valley, New York City, Long Island, and near Lake Ontario. Additionally, mute swans have shown an increasing

population trend of 0.68% from 1966-2015 in New York State (BBS 2017). The mute swan is classified as a *least concern* species according to the International Union for Conservation of Nature (IUCN 2017).

Mute swans are not protected federally under the MBTA because they are considered an invasive exotic species. They are, however, specifically protected from lethal removal under New York state regulations. The NYSDEC can issue permits to addle eggs, destroy mute swan nests, or remove adults. Under the NYSDEC Mute Swan Management Plan, New York has a target mute swan population of 2,275 individuals (175 upstate and 2,100 downstate) (NYSDEC 2019).

Because it is prohibited to take mute swans without a permit, few entities are allowed to take mute swans. WS would contact NYSDEC and obtain appropriate prior authorization before conducting any lethal control. 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.

From FY 2013 through FY 2017, a total of 277 mute swans have been lethally taken by WS to alleviate damage and 51 were nonlethally dispersed (Table 3.12).

Table 3.12 Number of mute swans dispersed and removed by WS in New York from FY 2013 to FY 2017.

Year	Dispersed by WS[1]	WS' Removal[1]
2013	14	194
2014	26	42
2015	4	12
2016	3	26
2017	4	3
Average	10.2	55.4

[1]Data reported by federal fiscal year.

Direct, Indirect, and Cumulative Effects:

WS' removal of mute swans to reduce damage and threats would be in compliance with Executive Order 13112. Additionally, any lethal take by WS' could be furthering the Atlantic Flyway management goal since mute swans are considered an invasive, exotic species. This goal is to reduce the mute swan population in the Atlantic Flyway to levels that will minimize negative ecological impacts to wetland habitats and native migratory birds and to prevent further range expansion into unoccupied areas (Atlantic Flyway Council 2003). Based on the best scientific data, WS proposed removal level of 250 mute swans will have no adverse direct or indirect effects on mute swan populations.

Red-tailed Hawk Biology and Population Impacts

WS' proposed annual removal:

- Up to **100**

WS' proposed annual translocation:

- Up to **200**

Red-tailed hawk population statistics:

- New York population estimate: **13,000**
- BBS New York population trend change from 1966-2015: **+0.79%**
- BBS Eastern Region population trend change from 1966-2015: **+0.92%**

Impacts to red-tailed hawk population:

- WS proposed removal as percent of state population: **0.77%**

- Non- WS authorized take*: **127**
- Cumulative removal as percent of population: **1.75%**

*Highest authorized annual take from 2013-2017 for entities other than WS as permitted by USFWS.

Red-tailed hawks are one of the most widespread and recognizable raptors in North America (Preston and Beane 2009). Red-tailed hawks are generally found in open areas that are interspersed with patches of trees or other perching structures (Preston and Beane 2009). These raptors can be observed year-round across New York, especially around fields and woodland edges (Cornell Lab of Ornithology 2015). The open habitat and availability of perches makes airports attractive locations for red-tailed hawks and where most requests for assistance to alleviate threats occurs throughout the state. However, red-tailed hawks can also occasionally cause economic losses to agricultural producers when they feed on domestic fowl.

The number of red-tailed hawks observed in New York according to the BBS has shown an increasing trend of 0.79% from 1966-2015 (BBS 2017). According to the International Union for Conservation of Nature, the red-tailed hawk is classified as a *least concern* species (IUCN 2017).

As part of an integrated approach to reducing threats, WS would first employ nonlethal methods (e.g., pyrotechnics, aversive noise, trap/translocate) to disperse or move red-tailed hawks when appropriate and safe. While translocation of raptors can be effective, trapping and translocation is not always possible when birds persist on the airfield or when birds return to the airport after being translocated. The number of red-tailed hawks addressed by WS and other entities in New York to alleviate damage is shown in Table 3.13. According to USFWS data, the highest authorized annual removal from 2013 to 2017 for non-WS entities was 127 birds. This number, in addition to the WS proposed removal, was used to assess the cumulative removal.

Table 3.13 Number of red-tailed hawks removed and translocated by WS and other entities in New York from FY 2013 - FY 2017.

	Removal under Depredation Permits		
Year	WS' Permits[1,2]	Other Entities' Permits[2]	Translocation by WS Personnel[3, 4]
2013	3	3	0
2014	0	6	1
2015	0	11	0
2016	0	24	10
2017	0	6	26
Average	0.6	10	7.4

[1]WS' removal under a depredation permit issued to WS in New York; additional removals by WS under permits held by cooperators are reflected as a component of the Other Entities' Permits.
[2]Data reported by USFWS by calendar year.
[3]Data reported by federal fiscal year.
[4]WS' authorized translocation under depredation permits issued to WS in New York or issued to WS' cooperators in New York.

Direct, Indirect, and Cumulative Effects:
WS' proposed removal is only 0.77% of the statewide population and the red-tailed hawk population continues to increase. Therefore, WS' proposed removal will have no adverse direct or indirect effects on red-tailed hawk populations. Red-tailed hawks are afforded protection under the MBTA and removal is only allowed through the issuance of a depredation permit and only at those levels stipulated in the permit. The potential authorized removal from all non-WS entities combined with WS proposed removal is also not expected to create adverse cumulative impacts, constituting a collective 1.75% of the statewide population.

Additionally, WS could live-capture and translocate up to 200 red-tailed hawks that pose a threat to cause damage. WS' proposed translocation of up to 200 red-tailed hawks is expected to have no adverse direct effects on the red-tailed hawk population. Although the live-capture and translocation of this species would be a nonlethal method of reducing damage or threats of damage, red-tailed hawks could be translocated during their nesting season which could lower nesting success. Reduced nesting success could occur by removing one of the adult pairs. However, significant adverse indirect

effects from translocation are not expected to occur to the population of red-tailed hawks in New York. Red-tailed hawks captured and translocated could be banded for identification purposes using United States Geological Survey approved metal leg-bands appropriate for the species. Banding would occur pursuant to a banding permit issued by the United States Geological Survey. Fair et al. (2010) stated "[w]*hen appropriate* [leg] *band sizes are used, the occurrence and rate of adverse effects on the subjects is ordinarily very low*". The translocation of red-tailed hawks can only occur when permitted by the USFWS. Therefore, all removal, including live-capture and translocation by WS, is authorized and occurs at the discretion of the USFWS, which ensures cumulative take is considered as part of population management objectives for red-tailed hawks.

Rock Pigeon Biology and Population Impacts

WS' proposed annual removal:

- Up to **10,000**

Rock pigeon population statistics:

- New York population estimate: **500,000**
- BBS New York population trend change from 1966-2015: **-1.52%**
- BBS Eastern Region population trend change from 1966-2015: **-1.6%**

Impacts to rock pigeon population:

- WS proposed removal as percent of state population: **2.00%**

Rock pigeons are an introduced rather than native species and are therefore not protected by federal law. Rock pigeons are closely associated with humans as human structures and activities provide them with food and sites for roosting, loafing, and nesting (Williams and Corrigan 1994). Thus, they are commonly found around city buildings, bridges, parks, farm yards, grain elevators, feed mills, and other man-made structures (Williams and Corrigan 1994). Additionally, although pigeons are primarily grain and seed eaters, they will readily feed on garbage, livestock manure, spilled grains, insects, and any other available bits of food (Williams and Corrigan 1994). Rock pigeons are found throughout New York, especially in cities and town or at farms with livestock.

BBS observations show a decreasing population trend of 1.52% from 1966-2015 for New York (BBS 2017). According to the International Union for Conservation of Nature, the rock pigeon is classified as a *least concern* species (IUCN 2017).

Since rock pigeons are a non-native species and are, therefore, afforded no protection under the MBTA, the removal of pigeons to alleviate damage or to reduce threats can occur without the need for a depredation permit from the USFWS. Because of this, the number of rock pigeons lethally removed to alleviate damage or threats in New York by non-WS entities is unknown since the reporting of pigeon removal is not required. The number of rock pigeons dispersed and lethally removed by WS in New York from FY 2013 through FY 2017 can be seen in Table 3.14.

Table 3.14 Number of rock pigeons dispersed and removed by WS in New York from FY 2013 through FY 2017. These totals include birds taken under WS' permit and other entities' permits.

Year	Dispersed by WS[1]	WS' Removal[1]
2013	249	3,368
2014	205	2,057
2015	267	1,764
2016	138	1,440
2017	159	2,108
Average	203.6	2,147.4

[1]Data reported by federal fiscal year.

Direct, Indirect, and Cumulative Effects:
WS' proposed removal of rock pigeons is of a low magnitude, 2.00% of the statewide population and therefore will have no adverse direct or indirect effects on rock pigeon populations in New York. Additionally, WS' proposed pigeon damage management activities would be conducted pursuant to Executive Order 13112. 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. Since rock pigeons compete with native species for resources, any take could be viewed as benefitting the natural environment. Although non-WS removal is unknown, WS does not anticipate any significant adverse cumulative impacts on rock pigeon populations in New York.

Snowy Egret Biology and Population Impacts

WS' proposed annual removal:

- Up to **40**

Snowy egret population statistics:

- Global population estimate: **1,000,000**
- BBS Eastern Region population trend change from 1966-2015: **-0.56%**

Impacts to snowy egret population:

- WS proposed removal as percent of global population: **0.004%**
- Non- WS authorized take*: **10**
- Cumulative removal as percent of population: **0.005%**

*Highest authorized annual take from 2013-2017 for entities other than WS as permitted by USFWS.

Snowy egrets are medium-sized herons with entirely white plumage and characteristic black legs with bright yellow feet (Parsons and Master 2000). The snowy egret is a local summer resident that nests in small numbers throughout the greater New York City/Long Island area. Snowy egrets can also be found locally in the Hudson River Valley as well as around the great lakes of New York.

People sought snowy egrets for their plumage to meet demands for the millinery trade in the late 1800s and early 1900s. After the passage of laws that ended plume hunting, populations of snowy egrets began to rebound and appeared to expand their breeding range in the United States (Parsons and Master 2000). Although the number of snowy egrets observed along routes surveyed during the BBS across the eastern region of United States has decreased by 0.56% from 1966-2015, an increase in population by 0.5% has been observed since 2005 in the same geographic area (BBS 2017). The global population is estimated at 1,000,000 birds (Partners in Flight 2019). According to the International Union for Conservation of Nature, the snowy egret is classified as a *least concern* species (IUCN 2017).

The WS program has not received requests for assistance associated with snowy egrets in the last five years; however, snowy egrets are a common bird species that cause damage to aquaculture resources (Parkhurst et al. 1987, Parsons and Master 2000). Snowy egrets are also occasional visitors to airports where they can pose an aircraft strike risk. Therefore, the WS program could receive requests for assistance associated with snowy egrets in or around New York State airports.

According to USFWS data, there were no snowy egrets removed in New York either by WS or other entities between FY 2013 to FY 2017. USFWS data reports that the highest authorized annual removal over the last five years by non-WS entities was 10 birds. This number, in addition to the WS proposed removal, was used to assess the cumulative removal.

Direct, Indirect, and Cumulative Effects:
Based on the best scientific data, and given an increasing population trend from 2005-2015, WS' proposed removal level will have no adverse direct effects on snowy egret populations. WS' proposed take of up to 40 individuals would

constitute only 0.004% of the global population. Direct operational assistance conducted by WS on snowy egrets could occur anytime of the year in New York; however, if assistance occurs in the spring, there could be an impact on the nesting and/or breeding success of individuals that are in close proximity to that area; this localized impact would be minimal and therefore would also not cause adverse indirect effects on the statewide snowy egret populations.

WS does not expect there to be adverse cumulative impacts on snowy egret populations from WS proposed removal combined with the potential authorized removal from all non-WS entities as it only represents 0.005% of the global population. The removal of snowy egrets can only occur when authorized through the issuance of depredation permits by the USFWS.

Snowy Owl Biology and Population Impacts

WS' proposed annual removal:

- Up to **30**

WS' proposed annual translocation:

- Up to **100**

Snowy owl population statistics:

- North American continental population estimate: **15,000**

Impacts to snowy owl population:

- WS proposed removal as percent of continental population: **0.20%**
- Non-WS authorized take*: 2**0**
- Cumulative removal as percent of population: **0.33%**

*Highest authorized annual take from 2013-2017 for entities other than WS as permitted by USFWS.

Snowy owls breed in open terrain of the artic barrens from the Aleutian Islands along the northern edge of Alaska, throughout the Canadian Arctic Islands and from northern Yukon, northeastern Manitoba, northern Quebec, and northern Labrador (Holt et al. 2015), and are generally not present in New York from spring to fall. They can be found in similar open habitats during their winter migrations. During the winter migrations, snowy owls can be found across Canada, Alaska, and the northern edge of the United States (Holt et al. 2015). The open habitats of airports provide ideal wintering areas for snowy owls. Their low-flying behavior, along with their large size and body mass (Holt et al. 2015) makes them a significant hazard for a damaging strike. From 1990-2017, there were 259 reported snowy owl strikes with civil aircrafts in the United States, 20 of which caused damage (FAA 2019).

The number of snowy owls observed during the CBC in New York has been variable in recent years ranging from as few as 1 (2012) and as many as 102 (2013). There are no breeding or year-round populations of snowy owls within New York, and population trend data is limited and long-term data is lacking (Holt et al. 2015).

WS dispersed 11 snowy owls from FY 2013 to FY 2017. Unfortunately, snowy owls generally become easily habituated to harassment measures and quickly become non-responsive, moving only a short distance or not at all. Thus, additional methods for wildlife hazard management may be necessary. As part of an integrated approach to reducing threats, WS would first employ nonlethal harassment methods (e.g., pyrotechnics, aversive noise, vehicle chasing) to disperse or move snowy owls when appropriate and safe. If snowy owls are deemed an immediate threat to aviation safety (e.g., flying along an active runway) or if repeated nonlethal harassment methods have failed, WS may need to implement lethal removal options. The number of snowy owls addressed by WS and other entities in New York to alleviate damage is shown in table 3.15. From FY 2013 to FY 2017, WS live captured and translocated 10 snowy owls, and did not lethally remove any snowy owls.

According to USFWS data, the highest authorized annual removal from 2013 to 2017 for non-WS entities was 20 birds. This number, in addition to the WS proposed removal, was used to assess the cumulative removal.

Table 3.15 Number of snowy owls removed and translocated by WS and other entities in New York from FY 2013 - FY 2017.

	Removal under Depredation Permits		
Year	WS' Permits[1,2]	Other Entities' Permits[2]	Translocation by WS Personnel[3,4]
2013	0	4	0
2014	0	1	3
2015	0	0	3
2016	0	1	3
2017	0	5	1
Average	0	2,2	2

[1]WS' removal under a depredation permit issued to WS in New York; additional removals by WS under permits held by cooperators are reflected as a component of the Other Entities' Permits.
[2]Data reported by USFWS by calendar year.
[3]Data reported by federal fiscal year.
[4]WS' authorized translocation under depredation permits issued to WS in New York or issued to WS' cooperators in New York.

Direct, Indirect, and Cumulative Effects:

WS may translocate up to 100 snowy owls, and may lethally remove up to 30 snowy owls that are non-responsive to nonlethal methods, including owls that have been translocated but return to the airport and are deemed immediate threats to aviation safety. WS' proposed take of up to 30 individuals would constitute only 0.20% of the continental population. WS does not expect there to be adverse cumulative impacts on snowy owl populations from WS proposed removal combined with the potential authorized removal from all non-WS entities as it only represents 0.33 of the continental population. WS does not expect there to be adverse direct, indirect, or cumulative impacts on snowy owl populations based on the proposed maximum removal levels.

The live-capture and translocation of snowy owls to appropriate habitat would not adversely affect populations since the owls would be unharmed. Banding would occur pursuant to a banding permit issued by the United States Geological Survey. Fair et al. (2010) stated "[w]hen appropriate [leg] band sizes are used, the occurrence and rate of adverse effects on the subjects is ordinarily very low." Therefore, WS does not expect the use of appropriately sized leg bands to adversely affect snowy owl populations. The limited lethal removal would not reach a magnitude that would cause adverse effects to the snowy owl population.

Turkey Vulture Biology and Population Impacts

WS' proposed annual removal:

- Up to 750

Turkey vulture population statistics:

- New York population estimate: **30,000**
- BBS New York population trend change from 1966-2015: **5.79%**
- BBS Eastern Region population trend change from 1966-2015: **3.58%**

Impacts to turkey vulture population:

- WS proposed removal as percent of state population: **2.50%**
- Non- WS authorized take*: **136**
- Cumulative removal as percent of population: **2.95%**

*Highest authorized annual take from 2013-2017 for entities other than WS as permitted by USFWS.

Turkey vultures can be found throughout Mexico, across most of the United States, and along the southern tier of Canada (Kirk and Mossman 1998). These birds can exist in virtually all habitats but they are most abundant where forest is interrupted by open land (Kirk and Mossman 1998). Turkey vultures are social and often roost in large groups in trees, on cliffs, power lines, or on homes or other buildings (Kirk and Mossman 1998) and can live at least 20 years (Venable 1996).

Turkey vultures can be found throughout New York with an estimated population size of 30,000 individuals (Partners in Flight 2019). Additionally, populations have increased throughout the state by 5.79% (BBS 2017). According to the International Union for Conservation of Nature, turkey vultures are classified as a *least concern* species (IUCN 2017). Turkey vultures are protected under the MBTA. However, take can occur pursuant to the MBTA through depredation permits issued by the USFWS. Take of turkey vultures in New York can therefore occur under USFWS permits issued to WS, and under permits issued to other entities.

The number of turkey vultures addressed in New York by all entities to alleviate damage is shown in Table 3.16. According to USFWS data, the highest authorized annual removal over the last five years by non-WS entities was 136 birds. This number, in addition to the WS proposed removal, was used to assess the cumulative removal.

Table 3.16 Number of turkey vultures removed by WS and other entities in New York from FY 2013 - FY 2017.

	Removal under Depredation Permits	
	WS' Permits[1,2]	Other Entities' Permits[2]
Year		
2013	1	21
2014	0	8
2015	0	18
2016	8	9
2017	0	2
Average	1.8	11.6

[1]WS' removal under a depredation permit issued to WS in New York; additional removals by WS under permits held by cooperators are reflected as a component of the Other Entities' Permits.
[2]Data reported by USFWS by calendar year.

Direct, Indirect, and Cumulative Effects:
Based on the best scientific data, WS' proposed removal level will have no adverse direct effects on vulture populations; WS' proposed take of up to 750 individuals would constitute only 2.50% of the statewide population. Direct operational assistance conducted by WS on turkey vultures could occur anytime of the year in New York; however, if assistance occurs in the spring, there could be an impact on the nesting and/or breeding success of individuals that are in close proximity to that area; this localized impact would be minimal and therefore would also not cause adverse indirect effects on the statewide turkey vulture populations.

WS does not expect there to be adverse cumulative impacts on turkey vulture populations from WS proposed removal combined with the potential authorized removal from all non-WS entities. The cumulative removal of turkey vultures by all entities in New York including WS represents 2.95% of the statewide population. The removal of turkey vultures can only occur when authorized through the issuance of depredation permits by the USFWS.

Species to be Primarily Live-captured and Translocated or Dispersed (Limited Lethal Removal)

Several species within New York that have the potential to pose threats to aviation safety can often be managed by capture and translocation. WS may receive requests for the following species: American kestrels, barn owls, barred owls, Cooper's hawk, eastern screech owls, great horned owls, long-eared owls, merlins, northern goshawks, northern saw-whet owls, peregrine falcons, red-shouldered hawks, red-tailed hawks, rough-legged hawks, sharp-shinned hawks, short-eared owls, snowy owls, and wild turkeys. WS would address those requests for assistance primarily with nonlethal dispersal

methods and through live-capture and translocation of individual birds. For any species that is state listed as threatened or endangered, WS would address those requests entirely with nonlethal dispersal methods as well as live-capture and translocation. Based on the requests for assistance received previously and in anticipation of receiving additional requests for assistance, WS proposes the translocation of up to 25 of each: barn owls, barred owls, eastern screech owls, great horned owls, long-eared owls, merlins, northern goshawks (New York State status-special concern), northern harriers (New York State status-threatened), northern saw-whet owls, ospreys, peregrine falcons (New York State status-endangered), red-shouldered hawks (New York State status-special concern), rough-legged hawks, sharp-shinned hawks (New York State status-special concern), and short-eared owls (New York State status-endangered). WS also proposes the translocation of up to 75 Cooper's hawks (New York State status-special concern), up to 100 snowy owls, up to 200 red-tailed hawks, and up to 500 American kestrels. Additionally, 250 wild turkeys, including wild hybrid turkeys, could be live captured and relocated. Table 3.17 shows the number of birds translocated by WS in New York from FY 2013 and FY 2017.

Table 3.17 Number of birds translocated by WS in New York from FY 2013 to FY 2017 under WS or other entities' permits.

	Fiscal Year[1]					
Species	2013	2014	2015	2016	2017	Average
American kestrel	0	1	0	20	129	30
Cooper's hawk	0	0	0	3	16	3.8
Merlin	0	0	0	1	1	0.4
Peregrine falcon	0	0	0	3	5	1.6
Red-tailed hawk	0	1	0	10	26	7.4
Wild or wild hybrid turkey	0	0	13	55	0	13.6
Total translocation	0	4	16	74	48	

[1]Data reported by federal fiscal year

Lethal removal would only be conducted on species that are not state listed when immediate threats to human safety occur, such as when banded individuals have returned to the same airport after translocation or when habituation to nonlethal methods occurs. In addition, WS could also be requested to employ lethal methods under the proposed action alternative to address damage or threats of damage associated with those species, including damage to property, agricultural resources, and livestock. The number of each of the species in this section dispersed by WS in New York from FY 2013 to FY 2017 can be seen in Table 3.18. Between FY 2013 and FY 2017, WS lethally removed 40 red-tailed hawks and 95 wild turkeys. For all other species in this section, WS has conducted only nonlethal management techniques.

Table 3.18 Number of dispersal by WS in New York for species listed in Table 3.16 from FY 2013 to FY 2017.

	Fiscal Year[1]					
Species	2013	2014	2015	2016	2017	Average
American kestrel	63	72	32	78	195	88.6
Barn owl	0	0	0	0	0	0
Barred owl	0	0	0	0	0	0
Cooper's hawk	0	3	2	5	11	4.2
Eastern screech owl	0	0	0	0	0	0
Great horned owl	0	0	0	0	0	0
Long-eared owl	0	0	0	0	0	0
Merlin	0	0	0	0	4	0.8
Northern goshawk	0	0	1	0	0	0.2
Northern harrier	7	4	8	16	36	14.2
Northern saw-whet owl	0	0	0	0	0	0
Osprey	115	209	188	180	303	199
Peregrine falcon	18	37	32	35	45	33.4
Red-shouldered hawk	0	0	0	0	0	0
Red-tailed hawk	81	159	116	91	139	117.2

Rough-legged hawk	3	0	0	0	0	0
Sharp-shinned hawk	0	1	0	0	4	1
Short-eared owl	0	0	0	0	0	0
Snowy owl	3	3	2	3	0	2.2
Wild turkey	53	45	114	116	117	89
Total dispersal	228	324	307	344	551	

[1]Data reported by federal fiscal year

Direct, Indirect, and Cumulative Effects:

The above-mentioned species would not be translocated at a level that would cause adverse effects on the population of those species. These species listed are afforded protection under the MBTA and removal is only allowed through the issuance of a depredation permit and only at those levels stipulated in the permit. Additionally, New York State listed species will be addressed entirely with nonlethal dispersal methods as well as live-capture and translocation. Therefore, WS does not anticipate any direct or indirect effects to these birds' populations.

Although the live-capture and translocation of these species would be a nonlethal method of reducing damage or threats of damage, these species could be translocated during their nesting season which could lower nesting success. Reduced nesting success could occur by removing one of the adult pairs of any of these species. However, the USFWS, as the agency with management responsibility for migratory birds, could impose restrictions on removal or translocation of these birds as needed to assure cumulative removal does not adversely affect the continued viability of populations. Since removal of these species, including live-capture and translocation, can only occur when permitted by the USFWS pursuant to the MBTA through the issuance of depredation permits, all removal, including removal by WS, would only occur at levels authorized by the USFWS which ensures there are no adverse cumulative impacts on the population of these species in New York.

Additional Target Species

WS has addressed limited numbers of additional target species previously or anticipates addressing a limited number of additional species under the proposed action alternative. Requests for assistance associated with those species would occur infrequently or would involve only a few individuals. WS anticipates addressing those requests for assistance using primarily nonlethal dispersal methods. This group would include the following species: American golden plovers, American goldfinches, American woodcocks, black-bellied plovers, black terns, caspian terns, chimney swifts, chipping sparrows, clapper rails, common terns, dunlins, eastern kingbirds, eastern towhees, eskimo curlews, field sparrows, Forster's terns, grasshopper sparrows, gray catbirds, greater yellowlegs, gull-billed terns, Henslow's sparrows, hermit thrushes, king rails, Lapland longspurs, least bitterns, least sandpipers, least terns, lesser yellowlegs, loggerhead shrikes, palm warblers, pied-billed grebes, purple martins, royal terns, sanderlings, sedge wrens, semipalmated plovers, semiplamated sandpipers, spotted sandpipers, spruce grouses, Swainson's thrushes, upland sandpipers, Virginia rails, whimbrels, white-throated sparrows, and yellow-rumped warblers. It is unlikely that significant adverse direct or indirect effects will occur to these species populations by implementation of only nonlethal methods by WS.

Under the proposed action alternative, WS could receive requests for assistance to use lethal methods to remove certain species when nonlethal methods were ineffective or were determined to be inappropriate using the WS Decision model. An example could include birds that pose an immediate strike threat at an airport where attempts to disperse the birds were ineffective. Based on previous requests for assistance, anticipation of future requests for assistance, and the removal levels necessary to alleviate those requests for assistance, no more than 20 individuals each of American coots, American wigeons, black-crowned night-herons, boat-tailed grackles, Bonaparte's gulls, buffleheads, canvasbacks, cattle egrets, common goldeneyes, common loons, feral chickens, gadwalls, greater scaups, green herons, green-winged teals, horned grebes, Indian peafowls, lesser scaups, long-tailed ducks, monk parakeets, northern cardinals, northern pintails, northern shovelers, ospreys, red-breasted mergansers, redheads, red-headed woodpeckers, red-throated loons, ring-necked ducks, savannah sparrows, snow buntings, song sparrows, willets, and yellow-crowned night-herons, and no more than 10 individuals of American oystercatchers, barn owls, budgerigars, northern goshawks, and rough-legged hawks could be removed annually by WS.

American wigeons, buffleheads, canvasbacks, common goldeneyes, greater scaups, green-winged teals, lesser scaups, long-tailed ducks, northern shovelers, northern pintails, red-breasted mergansers, redheads, and ring-necked ducks maintain sufficient population densities to allow for annual harvest seasons. The proposed removal of up to 20 individuals under the proposed action would be a minor component of the annual removal of these species during the regulated hunting seasons.

WS does not expect the annual take of these species to occur at any level that would adversely affect populations of these species. Take would be limited to those individuals deemed causing damage or posing a threat and would only occur if issued a depredation permit by USFWS and the NYSDEC and only at levels stipulated in the permit. Therefore, the take of those bird species would occur in accordance with applicable state and federal laws and regulations authorizing take of migratory birds. The USFWS, as the agency with management responsibility for migratory birds, could impose restrictions on depredation take as needed to assure cumulative take does not adversely affect the continued viability of populations.

Nest Removal for Target Species

The destruction of nests may occur in limited numbers when a request is received to address damage or threats of damage. According to the Migratory Bird Treaty Act, the removal of eggs and nests with eggs is lethal take. WS will continue to account for the removal/destruction of nests by reporting these numbers annually to USFWS. All proposed nest removal is shown below in Table 3.19.

Table 3.19 Summary of WS proposed nest removal of birds analyzed in this EA.

Species	WS Proposed Removal of Nests	Species	WS Proposed Removal of Nests
American black duck	10	Hairy woodpecker	10
American oystercatcher	5	Herring gull	2,000
American robin	50	House sparrow*	100
Bald eagle	5	Killdeer	100
Barn swallow	250	Laughing gull	150
Barred owl	5	Mallard	150
Black-crowned night heron	20	Monk parakeet*	20
Blue jay	20	Mourning dove	50
Boat-tailed grackle	20	Mute swan*	250
Cliff swallow	200	Northern flicker	10
Common raven	10	Northern mockingbird	25
Crow (American or Fish)	10	Osprey	10
Double-crested cormorant	500	Red-tailed hawk	20
Downy woodpecker	10	Ring-billed gull	10,000
European starling*	200	Rock pigeon*	250
Feral waterfowl	20	Snowy egret	20
Gadwall	10	Tree swallow	200
Great black-backed gull	300	Wild turkey	100
Great blue heron	20	Willet	10
Great egret	20	Wood duck	10
Great horned owl	5		

*represents an introduced or invasive species

The destruction of nests by WS would occur in localized areas where nesting takes place. Nest destruction would have no significant adverse impact on the population of these bird species. Although there may be reduced fecundity for the individuals affected by nest destruction, these birds may relocate and nest elsewhere when confronted with repeated nest failures. However, this activity would have no long term effect on populations of these breeding birds. The removal of nests can only legally occur as authorized by the USFWS or NYSDEC through the issuance of a depredation permit, and

only at levels specified in the permit. When applying for a depredation permit, the requesting entity submits with the application the number of birds and nests requested to be taken to alleviate the damage. Therefore, under this alternative, the USFWS could: 1) deny an application for a depredation permit when requested to alleviate bird damage, 2) could issue a depredation permit at the removal levels requested, or 3) could issue permits at levels below those removal levels requested. This ensures that cumulative lethal removal is considered by USFWS as part of population management objectives for these birds.

Wildlife Disease Surveillance and Monitoring

Wildlife disease surveillance and monitoring would facilitate the early detection of an introduced pathogen. Effective implementation of a surveillance and monitoring system would also expedite planning and execution at regional and state levels, and facilitate partnerships between public and private interests, including efforts by federal, state, and local governments as well as non-governmental organizations, universities, and/or other interest groups.[6] Existing information on disease distribution and knowledge of the mixing of birds in migratory flyways has been used to develop a prioritized sampling approach based on the major North American flyways. Surveillance data from all of those areas are incorporated into national risk assessments, preparedness and response planning to reduce the adverse impacts of a disease outbreak in wild birds, poultry, or humans.

To provide the most useful information and a uniform structure for surveillance, five strategies for collecting samples in birds have been proposed (USDA 2005*b*). Those strategies include:

Investigation of Illness/Death in Birds: A systematic investigation of illness and death in wild birds may be conducted to determine the cause of the illness or the cause of death in birds. This strategy offers the best and earliest probability of detection if a pathogen is introduced by migratory birds 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 birds without additional birds being handled or killed.

Surveillance in Live Wild Birds: This strategy involves sampling live-captured, seemingly healthy wild birds to detect the presence of a disease. Wild birds that represent the highest risk of being exposed to or infected with a pathogen because of their migratory movement patterns (USDA 2005*b*), or birds 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 include capturing and handling the target bird species. Coordinating sampling with concurrent projects being conducted by state and federal agencies, universities, and others maximizes use of resources and minimizes the need for additional bird capture and handling.

Surveillance in Hunter-harvested Birds: Check stations for waterfowl hunting or other harvestable bird species provides an opportunity to sample birds to determine the presence of a pathogen, and supplement data collected during surveillance of live wild birds. Sampling of hunter-harvested birds would focus on species that are most likely to be exposed to pathogens, have relatively direct migratory pathways from those areas to the United States, and/or commingle in staging areas with species that could transport the virus from other parts of the world.

Sentinel Species: A sentinel animal refers to animals used to indicate disease presence. As such, waterfowl, gamefowl, and poultry flocks reared in backyard facilities may prove to be valuable for early detection and used for surveillance of diseases. For example, duck flocks may also be used as sentinels and placed in wetland environments where they could potentially be exposed to and infected with pathogens as they commingle with wild birds.

Environmental Sampling: Many pathogens can be found in both bird feces and the water in which the birds swim, defecate, and feed. This is the primary method of pathogen transmission to new birds and potentially to poultry, livestock, and humans. Analysis of water and fecal material from certain habitats can provide evidence of pathogens circulating in wild bird populations, the specific types of diseases, and pathogenicity. Monitoring of water and/or fecal samples

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

gathered from habitat is a reasonably cost effective, technologically achievable means to assess risks to humans, livestock, and other wildlife.

Direct, Indirect, and Cumulative Effects:
Under the disease sampling strategies listed above that could be implemented to detect or monitor avian diseases in the United States, WS' implementation of those sampling strategies would not create adverse direct or indirect effects on avian populations in the state. Sampling strategies that could be employed involve sampling live-captured birds that could be released on site after sampling occurs. The sampling (e.g., drawing blooding, feather sample, fecal sample) and the subsequent release of live-captured birds would not result in adverse direct or indirect effects since those birds are released unharmed on site. In addition, sampling of sick, dying, or hunter harvested birds would not result in the additive lethal removal of birds that would not have already occurred in the absence of a disease sampling effort. Therefore, the sampling of birds for diseases would not create adverse cumulative impacts on the populations of any of the birds addressed in this EA nor would result in any removal of birds 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 bird damage management activities will likely have no cumulative adverse effects on populations in New York. 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-induced alterations of wildlife habitat
- Natural alterations of wildlife habitat
- 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 specific elements lead to elevated target species populations or place target species at a juncture to cause damage to resources. WS' actions 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 - Bird Damage Management by WS using only Nonlethal Methods

Under this alternative, WS would not use lethal methods to resolve bird damage problems. Although some unintentional mortality might result from the use of bird capture devices like mist nets, these incidents are likely to be rare and would have negligible impacts on target species populations. Individuals, agencies and organizations would still be able to obtain permits for lethal bird removal from the USFWS and NYSDEC.

Direct, Indirect, and Cumulative Effects:
Although impacts depend greatly upon the experience, training, and methods available to the individuals conducting the BDM, direct and indirect impacts on target bird populations would likely be the same regardless of who is conducting them. Impacts to target bird populations could be less than Alternative 1 if less experienced individuals are not able to lethally remove or disperse as many birds as trained WS biologists/technicians would. On the other hand, less skilled individuals could lethally remove more individual birds than necessary to mitigate damage if they do not fully understand the species' biology or behavior. However, for the same reasons shown under Alternative 1, it is unlikely that significant

direct or indirect effects would occur to target species by implementation of this alternative. Because WS would be able to provide assistance with nonlethal BDM, risks of cumulative impacts to target bird populations from actions by non-WS entities are potentially lower than with Alternative 3. However, impacts from actions are likely similar among all alternatives.

Alternative 3-No Bird Damage Management Conducted by WS

Under this alternative, WS would not conduct bird damage management activities. WS would have no direct involvement with any aspect of addressing damage caused by birds and would provide no technical assistance. No removal of birds by WS would occur. Birds could continue to be lethally removed to resolve damage and/or threats occurring either through depredation permits issued by the USFWS, under the blackbird depredation order, under the control order for Muscovy ducks, during the regulated hunting seasons, or in the case of non-native species, removal could occur anytime using legally available methods. Management actions taken by non-federal entities would be considered the *environmental status quo*.

Direct, Indirect, and Cumulative Effects:
Local bird populations could decline, stay the same, or increase depending on actions taken by those persons experiencing bird damage. While WS would provide no assistance under this alternative, other individuals or entities could conduct lethal damage management resulting in direct or indirect impacts similar to the proposed action. Since birds would still be removed under this alternative, the potential direct, indirect, and cumulative effects on the populations of those bird species would be similar among all the alternatives for this issue. However, without WS's expertise in guiding individual efforts, the risk of direct, indirect, or cumulative impacts has the potential to be greater in this alternative.

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

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

The potential adverse effects to non-target plant and wildlife species occurs from the employment of methods to address bird damage. Under the proposed action, WS could provide both technical assistance and direct operational assistance to those persons requesting assistance. 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 target birds, and determine placement of methods to avoid exposure to non-target species. Standard operating procedures to prevent and reduce any potential adverse impacts on non-target wildlife are discussed in Chapter 2 of this EA. Despite the best efforts to minimize removal of non-target species during management activities, the potential for adverse impacts to these animals exists when applying both nonlethal and lethal methods to manage damage or reduce threats to safety. WS would document the removal of non-target species to ensure management activities or methodologies used in bird damage management do not create direct effects on non-target populations. WS would report this annually to the USFWS and/or the NYSDEC to ensure removal by WS is not creating a significant impact to these populations.

The WS program does not attempt to eradicate any species of native wildlife in the state. WS operates in accordance with international, federal, and state laws and regulations enacted to ensure species viability. WS operates on a small percentage (<5%) of the 54,556 square miles of the land mass in New York. Additionally, when utilizing kayaks or boats on a body of water, WS will follow the state guidelines on boat cleaning for water bodies of concern. Therefore, those

activities that would occur under any of the alternatives that involve bird damage management would not adversely affect biodiversity.

Direct, Indirect, and Cumulative Effects:
While every precaution is taken to safeguard against taking non-target plants and wildlife, the use of operational methods can result in the incidental removal of unintended species. Those occurrences are rare and should not affect the overall populations of any species under the proposed action. WS' removal of non-target species during activities to reduce damage or threats to human safety associated with birds is expected to be extremely low to non-existent.

WS would monitor the potential for removal of non-target wildlife, including threatened and endangered species, to ensure management activities or methodologies used in bird damage management do not create significant direct effects on those populations. Furthermore, WS would not be conducting work in sensitive habitats unless requested, and in conjunction with the appropriate regulatory agency. Direct control methods available to resolve and prevent bird damage employed by trained, knowledgeable personnel are highly selective for target birds. WS would annually report to the USFWS and/or the NYSDEC any non-target removal to ensure removal by WS is considered as part of management objectives established. Additionally, WS would work with USFWS to identify and implement conservation measures to minimize to the greatest extent possible the likelihood of impacting federally listed threatened and endangered species. The potential impacts to non-target or threatened and endangered plants and wildlife are similar to the other alternatives and are considered to be minimal to non-existent. In the unlikely event that a threatened or endangered species is taken by WS, the event would be reported immediately to USFWS. From 2013 to 2017, WS did not take any federally threatened or endangered species while conducting bird damage management activities in New York. Additionally, WS did not lethally remove any state listed species, and any translocation of state threatened or endangered species occurred in consultation with NYSDEC and with the USFWS permitting office.

Nonlethal methods have the potential to cause adverse direct effects to non-target species, including threatened and endangered species, primarily through exclusion, harassment, and dispersal. The use of auditory and visual dispersal methods used to reduce damage or threats caused by birds are also likely to disperse non-target birds in the immediate area the methods are employed. Therefore, non-target birds may be dispersed from an area while employing nonlethal dispersal techniques. However, like target species, the potential direct impacts on non-target species are expected to be temporary with target and non-target species often returning after the cessation of dispersal methods. Nonlethal methods would not be employed over large geographical areas or applied at such intensity that essential resources (e.g., food sources and habitat) would be unavailable for extended durations or over a wide geographical scope that long-term adverse effects would occur to a species' population. Nonlethal methods are generally regarded as having minimal direct impacts on overall populations of wildlife since individuals of those species are unharmed. Any exclusionary device erected to prevent access of target species also potentially excludes species that are not the primary reason the exclusion was erected; therefore, if the area is large enough, potential indirect effects on non-target species may occur, but these are expected to be minimal. The use of nonlethal methods would not have significant adverse impacts on non-target populations under any of the alternatives.

Other nonlethal methods available for use under this alternative include live traps, nets, translocation, and repellents. Live traps (e.g., cage traps, walk-in traps, decoy traps) and nets restrain wildlife once captured and are considered live-capture methods. Live traps have the potential to capture non-target species. Trap and net placement in areas where target species are active and the use of target-specific attractants would likely minimize the capture of non-target wildlife. As traps and nets are attended to regularly, generally any non-target birds captured can be released on site unharmed. Therefore, no direct effects are expected on non-target species.

Only those repellents registered with the EPA pursuant to the FIFRA and registered for use in the state would be recommended and used by WS under this alternative. Therefore, the use and recommendation of repellents would not have negative direct or indirect effects on non-target species when used according to label requirements. Most repellents for birds are derived from natural ingredients that pose a very low risk to non-target birds when exposed to or when ingested. One chemical commonly registered with the EPA is methyl anthranilate, which naturally occurs in grapes. Methyl anthranilate has been used to flavor food, candy, and soft drinks. This product claims to be unpalatable to many bird species. Several products are registered for use to reduce bird damage containing methyl anthranilate. Formulations

containing those chemicals are liquids that are applied directly to susceptible resources. Similarly, when used in accordance with the label requirements, the use of Avitrol would also not create adverse direct effects on non-target wildlife when used according to label instructions.

The use of firearms is essentially selective for target species since animals are identified prior to application; therefore, no adverse direct or indirect effects to non-target wildlife would be anticipated from use of this method. The euthanasia of birds by WS' personnel would be conducted in accordance with WS Directive 2.505. Euthanasia would follow AVMA guidelines, whenever practicable. Since live-capture and chemical immobilization of birds occurs prior to the administering of euthanasia techniques, no adverse direct or indirect effects to non-target species would occur under this alternative. WS' recommendation that birds be harvested during the regulated season by private entities to alleviate damage would not increase risks to non-target wildlife.

Under the Bald and Golden Eagle Protection Act, activities that could result in the "take" of eagles cannot occur unless the USFWS allows those activities to occur through the issuance of a permit. Take could occur through purposeful take (e.g., harassing an eagle from an airport using pyrotechnics to alleviate aircraft strike hazards) or non-purposeful take (e.g., unintentionally capturing an eagle in a trap). Both purposeful take and non-purposeful take require a permit from the United States Fish and Wildlife Service (see 50 CFR 22.26, 50 CFR 22.27). Additionally, bald eagles are protected in New York State under ECL 11-0537. In those cases where purposeful take could occur or where there is a high likelihood of non-purposeful take occurring, WS would apply for a permit for those activities.

It is possible that routine activities conducted by WS' personnel under the proposed action alternative could occur in areas where bald eagles are present, which could disrupt the current behavior of an eagle or eagles that were nearby during those activities. As discussed previously, "take" as defined by the Bald and Golden Eagle Protection Act, include 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 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 non-purposeful take of bald 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 nested 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 2007). 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. Activities, such as walking to a site, discharging a firearm, or riding an ATV along a trail, generally represent short-term disturbances to sites where those activities take place. WS would conduct activities that were located near eagle nests using the National Bald Eagle Management Guidelines (USFWS 2007*b*). The categories that would 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. The NYSDEC also issued the NYS Bald Eagle Conservation Plan in 2016. WS would take active measures to avoid disturbance of bald eagle nests by following these guidelines and plans. 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 bald eagles.

A common concern regarding the use of DRC-1339 is the potential risk to non-targets. WS uses a variety of methods to maximize the uptake of treated bait by target species and to prevent non-target species from ingesting the treated bait. All label requirements of DRC-1339 would be followed to minimize non-target hazards. As required by the label, all potential bait sites are pre-baited and monitored for non-target use as outlined in the pre-treatment observations section of the label. WS does not apply treated baits to locations where pre-bait was not accepted by target species. Treated bait is mixed with untreated bait per label requirements when applied to bait sites to minimize the likelihood of non-target species finding and consuming bait that has been treated. The bait type selected can also limit the likelihood that non-target species would consume treated bait since some bait types are not preferred by non-target species.

By acclimating target bird species to a feeding schedule, baiting can occur at specific times to ensure bait placed is quickly consumed by target bird species, especially when large flocks of target species are present. The acclimation period allows treated bait to be present only when birds are conditioned to be present at the site and provides a higher likelihood that treated bait would be consumed by the target species, which makes it unavailable to non-target wildlife. In addition, many bird species when present in large numbers tend to exclude non-target birds from a feeding area due to their aggressive behavior and by the large number of conspecifics present at the location. Any treated bait remaining at the location after target birds had finished feeding would be removed to avoid attracting non-target species. Beginning one day after bait application, the applicator or land manager will search treated areas, animal pens, and immediate surrounding areas and collect dying birds and carcasses, and bury or burn them according to applicable laws.

DRC-1339 Primary Hazard Profile - DRC-1339 was selected for reducing bird damage because of its high toxicity to blackbirds (DeCino et al. 1966, West et al. 1967, Schafer, Jr. 1972) and low toxicity to most mammals, sparrows, and finches (Schafer, Jr. and Cunningham 1966, Apostolou 1969, Schafer, Jr. 1972, Schafer, Jr. et al. 1977, Matteson 1978, Cunningham et al. 1979, Cummings et al. 1992, Sterner et al. 1992). The likelihood of a non-target bird obtaining a lethal dose is dependent on: (1) frequency of encountering the bait, (2) length of feeding bout, (3) the bait dilution rate, (4) the bird's propensity to select against the treated bait, and (5) the susceptibility of the non-target species to the toxicant. Birds that ingest DRC-1339 die because of irreversible necrosis of the kidney and subsequent inability to excrete uric acid (*i.e.*, uremic poisoning) (DeCino et al. 1966, Felsenstein et al. 1974, Knittle et al. 1990). Birds ingesting a lethal dose of DRC-1339 usually die in one to three days.

The median acute lethal dose (LD_{50})[7] values for starlings, blackbirds, magpies, and corvids range from one to five mg/kg (Eisemann et al. 2003). The acute oral toxicity (LD_{50}) of DRC-1339 has been estimated for over 55 species of birds (Eisemann et al. 2003). For American crows, the median acute lethal dose has been estimated at 1.33 mg/kg (DeCino et al. 1966). DRC-1339 is toxic to mourning doves, pigeons, quail (*Coturnix coturnix*), chickens and ducks (*Anas* spp.) at ≥5.6 mg/kg (DeCino et al. 1966). In cage trials, Cummings et al. (1992) found that 2% DRC-1339-treated rice did not kill savannah sparrows (*Passerculus sandwichensis*). Gallinaceous birds and waterfowl may be more resistant to DRC-1339 than blackbirds, and their large size may reduce the chances of ingesting a lethal dose (DeCino et al. 1966). Avian reproduction does not appear to be affected from ingestion of DRC-1339 treated baits until levels are ingested where toxicity is expressed (USDA 2001).

There have been concerns expressed about the study designs used to derive acute lethal doses of DRC-1339 for some bird species (Gamble et al. 2003). The appropriateness of study designs used to determine acute toxicity to pesticides has many views (Lipnick et al. 1995). The use of small sample sizes was the preferred method of screening for toxicity beginning as early as 1948 to minimize the number of animals involved (Dixon and Mood 1948). In 1982, the EPA established standardized methods for testing for acute toxicity that favored larger sample sizes (EPA 1982). More recently, regulatory agencies have again begun to debate the appropriate level of sample sizes in determining acute toxicity based on a growing public concern for the number of animals used for scientific purposes.

Based on those concerns, the Ecological Committee on FIFRA Risk Assessment (ECOFRAM) was established by the EPA to provide guidance on ecological risk assessment methods (EPA 1999). The committee report recommended to the EPA that only one definitive LD_{50} be used in toxicity screening either on the mallard or northern bobwhite and recommended further testing be conducted using the up-and-down method (EPA 1999). Many of the screening methods used for DRC-1339 prior to the establishment of EPA guidelines in 1982 used the up-and-down method of screening (Eisemann et al. 2003).

A review of the literature shows that LD_{50} research using smaller sample sizes conducted prior to EPA established guidelines are good indicators of LD_{50} derived from more rigorous designs (Bruce 1985, Bruce 1987, Lipnick et al. 1995). Therefore, acute and chronic toxicity data gathered prior to EPA guidance remain valid and to ignore the data would be inappropriate and wasteful of animal life (Eisemann et al. 2003).

[7] An LD_{50} is the dosage in milligrams of material per kilogram of body weight required to cause death in 50% of a test population of a species.

DRC-1339 Secondary Hazards - Secondary poisoning has not been observed with DRC-1339 treated baits. During research studies, carcasses of birds that died from DRC-1339 were fed to raptors and scavenger mammals for 30 to 200 days with no symptoms of secondary poisoning observed (Cunningham et al. 1979). This can be attributed to relatively low toxicity to species that might scavenge on blackbirds killed by DRC-1339 and its tendency to be almost completely metabolized in the target birds, which leaves little residue to be ingested by scavengers.

DRC-1339 is rapidly metabolized and excreted and does not bioaccumulate, which probably accounts for its low secondary hazard profile (Schafer, Jr. 1991). For example, cats, owls, and magpies would be at risk only after exclusively eating DRC-1339-poisoned starlings for 30 continuous days (Cunningham et al. 1979). No probable risk is expected to American kestrels based on the low hazard quotient value for marsh hawks used as a surrogate species (Schafer, Jr. 1970). The risk to mammalian predators from feeding on birds killed with DRC-1339 also appears to be low (Johnston et al. 1999).

The risks associated with non-target species exposure to DRC-1339 baits have been evaluated in rice fields in Louisiana (Glahn et al. 1990, Cummings et al. 1992, Glahn and Wilson 1992), poultry and cattle feedlots in several western states (Besser 1964, Ford 1967, Royall et al. 1967), ripening sunflower fields in North Dakota (Linz et al. 2000), and around blackbird staging areas in east-central South Dakota (Knutsen 1998, Linz et al. 1995, Smith 1999). Smith (1999) used field personnel and dogs to search for dead non-target species and found no non-target carcasses that exhibited histological signs consistent with DRC-1339 poisoning. The other studies also failed to detect any non-target birds that had succumbed to DRC-1339. However, DRC-1339 is a slow-acting avicide and thus, some birds could move to areas not searched by the study participants before dying.

DRC-1339 Environmental Degradation - DRC-1339 is unstable in the environment and degrades rapidly when exposed to sunlight, heat, or ultra violet radiation and has a half-life of less than two days. DRC-1339 is highly soluble in water but does not hydrolyze and degradation occurs rapidly in water. The chemical tightly binds to soil and has low mobility. The half-life is about 25 hours, which means it is nearly 100% broken down within a week, and identified metabolites (i.e., degradation chemicals) have low toxicity. Aquatic and invertebrate toxicity is low (EPA 1995). Therefore, WS does not expect any adverse indirect effects on non-target species through chemical contamination from soil or water supplies.

Additional concerns have been raised regarding the risks to non-target wildlife associated with crows caching bait treated with DRC-1339. Crows are known to cache surplus food usually by making a small hole in the soil using the bill, by pushing the food item under the substrate, or covering items with debris (Verbeek and Caffrey 2002). Distances traveled from where the food items were gathered to where the item is cached varies, but some studies suggest crows travel up to 100 meters (Kilham 1989) and up to 2 kilometers (Cristol 2001, Cristol 2005). Caching activities appear to occur throughout the year, but may increase when food supplies are low. Therefore, the potential for treated baits to be carried from a bait site to surrounding areas exists as part of the food cache behavior exhibited by crows.

Several mitigating factors must be overcome for non-target risks to occur from bait cached by a crow. Those factors being: (1) the non-target wildlife species would have to locate the cached bait, (2) the bait-type used to target crows would have to be palatable or selected for by the non-target wildlife, (3) the non-target wildlife species consuming the treated bait would have to consume a lethal dose from a single bait, and (4) if a lethal dose is not achieved by eating a single treated cached bait, the non-target wildlife would have to ingest several treated baits (either from cached bait or from the bait site) to obtain a lethal dose which could vary by the species.

Summary

WS does not anticipate any adverse cumulative impacts on non-target species from the implementation of the proposed bird damage management methods. Based on the methods available to resolve bird damage and/or threats, WS does not anticipate the number of non-target species removed to reach a magnitude where declines in those species' populations would occur. Therefore, removal under the proposed action of non-target species will not create adverse cumulative effects on non-target species populations. DRC-1339 is currently only available for use by WS employees; therefore, no adverse cumulative impacts are expected from the use of these chemicals due to no additional contribution of these chemicals into the environment from non-WS entities. Starlicide, a product similar to DRC-1339, is currently not

registered in the state of New York; however, if it became registered, it would be available for use by licensed pesticide applicators. However, no adverse cumulative impacts are expected because Starlicide has a similar hazard profile to DRC-1339.

The proposed bird damage management could benefit many other wildlife species that are impacted by predation or competition for resources. For example, crows are generally very aggressive nesting area colonizers and will force other species from prime nesting areas. American crows often feed on the eggs, nestlings, and fledglings of other bird species. This alternative has the greatest possibility of successfully reducing bird 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 by using 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, and, as needed, additional conservation measures are discussed in Appendix C.

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 list of T&E species designated by the New York State Department of Environmental Conservation was also obtained during the development of this EA. Based on the methods and scope of activities proposed under this alternative, activities conducted within the scope of analysis would not adversely affect any species listed as threatened and endangered in the State of New York (Appendix D).

Alternative 2 - Bird Damage Management by WS using only Nonlethal Methods

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 bird in a live-capture device as outlined under Alternative 1. Although the availability of WS assistance with nonlethal BDM methods could decrease incentives for non-WS entities to use lethal BDM methods, non-WS efforts to reduce or prevent damage could result in less experienced persons implementing bird damage management methods and lead to a greater removal of non-target wildlife.

Direct, Indirect, and Cumulative Effects:

It is possible that non-specific damage management methods by non-WS entities could lead to unknown direct or indirect effects to non-target species populations, including T&E species. Hazards to T&E species could be more variable under this alternative than Alternative 1. Potential direct or indirect effects to non-target species could therefore be greater under this alternative if methods that are less selective or toxicants that cause secondary poisoning are used by non-WS entities. Direct effects on non-target wildlife from nonlethal methods of bird damage management conducted by WS would be similar to Alternative 1. Because WS would be able to employ nonlethal methods under this alternative, indirect effects on non-target species could occur when implementing exclusionary devices if the area is large enough, but these indirect effects are expected to be minimal. Additionally, WS would not be conducting work in sensitive habitats unless requested, and in conjunction with the appropriate regulatory agency. The ability to reduce negative effects caused by birds to wildlife species and their habitats, including T&E species, would be variable based upon the skills and abilities of the person implementing BDM techniques. While cumulative impacts would be variable, WS does not anticipate any significant cumulative impacts from this alternative.

Alternative 3-No Bird Damage Management Conducted by WS

Under this alternative, WS would not be directly involved with damage management activities, but birds could continue to be removed by individuals or agencies other than WS under depredation permits issued by the USFWS and the NYSDEC; removal would continue to occur during the regulated harvest season; non-native bird species could continue to be removed without the need for a permit; blackbirds could still be removed under the depredation order; and Muscovy ducks could be lethally removed under the control order. Risks to non-target species and T&E species would continue to occur from those who implement bird damage management activities on their own or through recommendations by the other federal, state, and private entities. Although some risks occur from those people that implement bird damage management in the absence of any involvement by WS, those risks are likely low and are similar to those under the other alternatives.

Direct, Indirect, and Cumulative Effects:
No direct or indirect impacts to non-target wildlife or T&E species would occur by WS under this alternative. The ability to reduce damage and threats of damage caused by birds to other wildlife species and their habitats, including T&E species, would be variable based upon the skills and abilities of the person implementing damage management actions under this alternative. The risks to non-target species 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-target species would be minimal to non-existent. If methods available were applied incorrectly or applied without knowledge of bird behavior, risks to non-target wildlife would be higher under this alternative. Therefore, adverse direct, indirect, or cumulative impacts to non-target species, including T&E species, could occur under this alternative; however WS does not anticipate any significant cumulative impacts.

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

A common concern is the potential adverse effects that 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 - Continuing the Current Integrated Approach to Managing Bird Damage (Proposed Action/No Action)

The cooperator requesting assistance is made aware through a MOU, cooperative service agreement, inter-agency agreement, 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.

WS would use the Decision Model to determine the appropriate method or methods that would effectively resolve the request for assistance. Those methods would be continually evaluated for effectiveness and if necessary, additional methods could be employed. Risks to human safety from technical assistance conducted by WS would be similar to those risks addressed under the other alternatives. The use of nonlethal 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.

Lethal methods available under the proposed action would include the use of firearms, DRC-1339, live-capture followed by euthanasia, snap traps, and the recommendation that birds be harvested during the regulated hunting season established for those species by the USFWS and the NYSDEC. Although some formulations of the avicide DRC-1339 are restricted to use by WS only, a similar product containing the same active ingredient as DRC-1339 could be available for use as a restricted use pesticide by other entities upon registration in New York.

WS' employees who conduct activities would be knowledgeable in the use of methods, wildlife species responsible for causing damage or threats, WS' Directives, and applicable local, state, and federal laws. 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 birds. 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. If locations where methods would be employed occur on private property in rural areas where access to the property is controlled and monitored, the risks to human safety from the use of methods would likely be less. If damage management activities occur at parks or near other public use areas, then risks of the public encountering damage management methods and the corresponding risk to human safety increases. Activities would generally be conducted when human activity is minimal (e.g., early mornings, at night) or in areas where human activities are minimal (e.g., in areas closed to the public).

Safety issues can arise related to misusing firearms and the potential human hazards associated with firearm use when employed to reduce damage and threats. To help ensure safe use and awareness, WS' employees who use firearms to conduct official duties are required to attend an approved firearm safety training course to remain certified for firearm use annually; WS' employees must attend a re-certification safety training course in accordance with WS Directive 2.615. WS' employees who carry and use firearms as a condition of employment are required to attest that they have not been convicted of a misdemeanor crime of domestic violence. A thorough safety assessment would be conducted before firearms were deemed appropriate to alleviate or reduce damage and threats to human safety when conducting activities. WS would work closely with cooperators requesting assistance to ensure all safety issues were considered before the use of firearms was deemed appropriate. All methods, including firearms, must be agreed upon with the cooperator to ensure the safe use of methods.

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 and product labels would ensure the safety of employees applying chemical methods. Birds euthanized by WS or removed using chemical methods would be disposed of in accordance with WS Directive 2.515 and applicable federal and state permits. All chemical euthanasia would occur in the absence of the public to further minimize risks.

Direct, Indirect, and Cumulative Effects:

The risks to human safety from the use of nonlethal and lethal methods, when used appropriately and by trained personnel, is considered low. Since WS personnel are required to complete and maintain firearms safety training, no adverse direct effects to human health and safety are expected.

Live-capture traps are typically set in situations where human activity is minimal to ensure public safety. Traps rarely cause serious injury and are triggered through direct activation of the device. Live-capture traps available for birds include walk-in style traps where birds enter, but are unable to exit. Therefore, human safety concerns associated with live traps used to capture birds require direct contact to cause bodily harm. Other traps are primarily used on airports where there is minimal potential human contact, and these traps also require direct contact to cause bodily harm. No adverse direct effects to human health and safety are expected through the use of live-capture traps and devices or other nonlethal methods. Other live-capture devices, such as cannon nets, pose minor safety hazards to the public 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; thereby, limiting exposure of the public to misuse of the method.

The recommendation of repellents or the use of those repellents registered for use to disperse birds could occur under the proposed action as part of an integrated approach to managing bird 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.

Risks to human safety from the use of avicides could occur either through direct exposure of the chemical or exposure to the chemical from birds that have been lethally removed. DRC-1339 (3-chloro-p-toluidine hydrochloride) is currently registered for use only by WS to be used for bird damage management in New York. The mixing, drying, and storage of DRC-1339 treated bait occurs in controlled areas that are not accessible by the public. Therefore, risks to public safety from the preparation of DRC-1339 are minimal. Some risks do occur to the handlers during the mixing process from inhalation and direct exposure on the skin and eyes. Adherence to label requirements during the mixing and handling of DRC-1339 treated bait for use of personal protective equipment ensures the safety of WS' personnel handling and mixing treated bait. Therefore, risks to handlers and mixers that adhere to the personal protective equipment requirements of the label are low.

Locations where treated bait may be placed are determined based on product label requirements (e.g., distance from water, specific location restrictions), the target bird species use of the site (determined through prebaiting and an acclimation period), on non-target use of the area (areas with non-target activity are not used or abandoned), and based on human safety (e.g., in areas restricted or inaccessible by the public or where warning signs have been placed). Once appropriate locations were determined, treated baits would be placed in feeding stations or would be broadcast using mechanical methods (ground-based equipment or hand spreaders) and by manual broadcast (distributed by hand) per label requirements. Once baited using the diluted mixture (treated bait and untreated bait) when required by the label, locations would be monitored for non-target activity and to ensure the safety of the public. After each baiting session, all uneaten bait would be retrieved. The prebaiting period allows treated bait to be placed at a location only when target birds were conditioned to be present at the site and provides a higher likelihood that treated bait would be consumed by the target species, which makes it unavailable for potential exposure to humans. To be exposed to the bait, someone would have to approach a bait site and handle treated bait. If the bait had been consumed by target species or was removed by WS, then treated bait would no longer be available and human exposure to the bait could not occur.

There are many factors that minimize risk of public health problems from the use of DRC-1339. DRC-1339 is prohibited within 50 feet of standing water and cannot be applied directly to food or feed crops (DRC-1339 is not applied to feed materials that livestock can feed upon). DRC-1339 is highly unstable and degrades rapidly when exposed to sunlight, heat, or ultraviolet radiation. The half-life is about 25 hours. Therefore, in general, DRC-1339 on treated bait material is almost completely broken down within a week if not consumed or retrieved. The chemical is more than 90% metabolized in target birds within the first few hours after they consume the bait. Therefore, little material is left in bird carcasses that may be found or retrieved by people. Application rates of DRC-1339 are extremely low (EPA 1995). In order to be exposed, a human would need to ingest the internal organs of birds found dead from DRC-1339. The EPA has concluded that, based on mutagenicity (the tendency to cause gene mutations in cells) studies, this chemical is not a mutagen or a carcinogen (i.e., cancer-causing agent) (EPA 1995).

Of additional concern is the potential exposure of people to crows harvested during the regulated hunting season that have ingested DRC-1339 treated bait. The hunting season for crows occurs from September 1st - March 31st with no daily harvest (bag) limit or possession limit. Under the proposed action, baiting using DRC-1339 to reduce crow damage could occur during the period of time when crows can be harvested. Although baiting could occur in rural areas during those periods, most requests for assistance to manage crow damage during the period of time when crows can be harvested occur in urban areas associated with urban crow roosts. Crows using urban communal roost locations often travel long distances to forage before returning to the roost location during the evening.

For a crow that ingested DRC-1339 treated bait to pose a potential risk to human safety to someone harvesting crows during the hunting season, a hunter would have to harvest a crow that ingested DRC-1339 treated bait and subsequently consume certain portions of the crow. The mode of action of DRC-1339 requires ingestion by crows so handling a crow harvested or found dead would not pose any primary risks to human safety. Although not specifically known for crows, in other sensitive species, DRC-1339 is metabolized and/or excreted quickly once ingested. In starlings, nearly 90% of the DRC-1339 administered dosages well above the LD50 for starlings was metabolized or excreted within 30 minutes of

dosage (Cunningham et al. 1979). In one study, more than 98% of a DRC-1339 dose delivered to starlings could be detected in the feces within 2.5 hours (Peoples and Apostolou 1967) with similar results found for other bird species (Eisemann et al. 2003). Once death occurs, DRC-1339 concentrations appear to be highest in the gastrointestinal tract of birds, but some residue could be found in other tissue of carcasses examined (Giri et al. 1976, Cunningham et al. 1979, Johnston et al. 1999) with residues diminishing more slowly in the kidneys (Eisemann et al. 2003). However, most residue tests to detect DRC-1339 in tissues of birds have been completed using DRC-1339 dosages that far exceeded the known acute lethal oral dose for those species tested and far exceeds the level of DRC-1339 that would be ingested from treated bait. Johnston et al. (1999) found DRC-1339 residues in breast tissue of boat-tailed grackles (Quiscalus major) using acute doses ranging from 40 to 863 mg/kg. The acute lethal oral dose of DRC-1339 for boat-tailed grackles has been estimated to be ≤ 1 mg/kg, which is similar to the LD50 for crows (Eisemann et al. 2003). In those boat-tailed grackles consuming a trace of DRC-1339 up to 22 mg/kg, no DRC-1339 residues were found in the gastrointestinal tract nor found in breast tissue (Johnston et al. 1999).

In summary, nearly all of the DRC-1339 ingested by sensitive species is metabolized or excreted quickly, normally within a few hours. Residues of DRC-1339 have been found in the tissues of birds consuming DRC-1339 at very high dosage rates that exceed current acute lethal dosages achieved under the label requirements of DRC-1339. Residues of DRC-1339 ingested by birds appear to be primarily located in the gastrointestinal tract of birds.

Under the proposed action, the controlled and limited circumstances in which DRC-1339 would be used would prevent any exposure of the public to this chemical. Based on current information, the human health risks from the use of DRC-1339 would be virtually nonexistent under this alternative.

All WS personnel are properly trained on all chemicals handled and administered in the field, ensuring their safety as well as the safety of the public. Therefore, adverse direct effects to human health and safety from chemicals used by WS are anticipated to be very low. The amount of chemicals used or stored by WS and cooperating agencies would be minimal to ensure human safety. No adverse indirect effects are anticipated from the application of any of the chemicals available for WS.

The recommendation by WS that birds be harvested during the regulated hunting season, which is established by the NYSDEC under frameworks determined by the USFWS, would not increase risks to human safety above those risks already inherent with hunting those species. Recommendations of allowing hunting on property owned or managed by a cooperator to reduce bird 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 season would further minimize risks associated with hunting. Although hunting accidents do occur, the recommendation of allowing hunting to reduce localized populations of birds would not increase those risks. Since the NYSDEC requires hunter and trapper safety training for all sportsmen, WS does not expect any additional adverse cumulative impacts to human safety from the use of firearms when recommending that birds be harvested during regulated hunting seasons to help alleviate damage.

Alternative 2 - Bird Damage Management by WS using only Nonlethal Methods

Under this alternative, WS would not use lethal BDM methods. Concerns about human health risks from WS' use of lethal bird damage management methods would be alleviated because no such use would occur. However, Avitrol products would be available to licensed pesticide applicators under this alternative. Benefits to the public from WS BDM activities will depend on the ability of WS to resolve problems using nonlethal methods and the effectiveness of non-WS BDM efforts. In situations where risks to human health and safety from birds cannot be resolved using nonlethal methods, benefits to the public will depend on the efficacy of non-WS use of lethal BDM methods. If lethal BDM techniques are implemented by individuals with less experience than WS, they may not be able to effectively resolve the problem or it may take longer to resolve the problem than with a WS program.

Direct, Indirect, and Cumulative Effects:
Because most methods available to resolve or prevent bird 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 could 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 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 human health and safety. DRC-1339 would not be available under this alternative to non-WS entities experiencing damage or threats from birds and WS would not use DRC-1339 under this alternative since it is lethal; therefore, no cumulative impacts to human health and safety should occur from these chemicals.

Alternative 3-No Bird Damage Management Conducted by WS

Under the no bird damage management alternative, WS would not be involved with any aspect of managing damage associated with birds, including technical assistance. Due to the lack of involvement in managing damage caused by birds, no impacts to human safety would occur directly from WS. This alternative would not prevent those entities experiencing threats or damage from birds from conducting damage management activities in the absence of WS' assistance. Many of the methods discussed in Appendix B would be available to those persons experiencing damage or threats and could be used to remove birds if permitted by the USFWS and/or the NYSDEC. The direct burden of implementing permitted methods would be placed on those experiencing damage.

Direct, Indirect, and Cumulative Effects:
Since most methods available to resolve or prevent bird damage or threats are available to anyone, the adverse direct, indirect, and cumulative effects to human safety from the use of those methods are similar among the alternatives. Non-chemical methods available to alleviate or prevent damage associated with birds generally do not pose risks to human safety. Since most non-chemical methods available for bird damage management involve the live-capture or harassment of birds, those methods are generally regarded as posing minimal adverse direct and indirect effects to human safety. 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 exist 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. DRC-1339 would not be available under this alternative to those experiencing damage or threats from birds, therefore no adverse direct, indirect, or cumulative impacts to human health and safety should occur from these chemicals. Under this alternative, shooting and nest destruction would be available to those persons experiencing damage or threats of damage when permitted by the USFWS and the NYSDEC. Firearms, when handled appropriately and with consideration for safety, pose minimal risks to human safety. However, methods employed by those persons not experienced in the use of methods or are not trained in their proper use, could increase the adverse direct, indirect, and/or cumulative impacts to human safety. Overall, the methods available to the public, when applied correctly and appropriately, pose minimal risks to human safety.

Issue 4 - Effects of Damage Management Activities on the Aesthetic Value of Birds

People often enjoy viewing, watching, and knowing birds exist as part of the natural environment and gain aesthetic enjoyment in such activities. Those methods available to alleviate damage are intended to disperse and/or remove birds. Nonlethal methods are intended to exclude or make an area less attractive, which disperses birds to other areas. Similarly, lethal methods are intended to remove those birds identified as causing damage or posing a threat of damage. The effects on the aesthetic value of birds as it relates to the alternatives are discussed below.

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

Under the proposed action, methods would be employed that would result in the dispersal, exclusion, or removal of individuals or small groups of birds to resolve damage and threats. All bird damage management activities are conducted

where a request for assistance has been received and only after agreement for such services have been agreed upon by the property owner or manager.

In some instances where birds are dispersed or removed, the ability of interested persons to observe and enjoy those birds would likely temporarily decline. Even the use of exclusionary devices can lead to the dispersal of wildlife if the resource being damaged was acting as an attractant. Thus, once the attractant has been removed or made unavailable, the wildlife would likely disperse to other areas where resources are more available. However, the ability to view and enjoy birds would remain if a reasonable effort was made to locate birds outside the area in which damage management activities were occurring. Further, given the mobile nature of birds, individuals could immigrate into new areas over time.

WS' proposal to reduce bird damage through harassment or lethal removal is not expected to interfere with the heritage of waterfowl hunting in New York State. Birds that are of damage management concern are typically found in urban or suburban locations that are not accessible to hunters.

Direct, Indirect, and Cumulative Effects:
Since those birds removed by WS under this alternative could be removed with a depredation permit issued by the USFWS, under depredation orders, under control orders, without the need for a permit (non-native species), or during the regulated hunting seasons, WS' involvement in taking those birds would not likely be additive to the number of birds that could be removed in the absence of WS' involvement. WS' removal of birds has been of low magnitude compared to the total mortality and populations of those species.

WS' bird damage management activities conducted pursuant to the proposed action is not expected to cause adverse direct or indirect effects on the aesthetic value of birds. However, direct impacts would be variable based on public perception, and may either include an increase or decrease in aesthetic benefits based on the individual's view. Some may feel that their ability to view and enjoy birds decreases with damage management activities. However, WS involvement could lead to the return of additional native bird species that otherwise would not be there, which could increase the enjoyment of viewing the birds. Some aesthetic value would be gained by the removal of birds and the return of a more natural environment, including the return of native wildlife and plant species that may be suppressed or displaced by high bird densities. Other people who are exposed to bird damage experience a reduction of aesthetic enjoyment of wildlife because they feel that these birds are overabundant or objectionable. Continued increases in numbers of individuals or the continued presence of birds causing damage may lead to further degradation of some people's enjoyment of any wildlife or the natural environment. The actions of WS would positively affect the aesthetic enjoyment of wildlife or the environment for those people who were being adversely affected by the specific bird damage.

These same management actions are not likely to effect the ability of people to hunt waterfowl because many of those actions take place in urban or suburban locations that are not accessible to hunters. Therefore, people who enjoy hunting will still be able to benefit from the socio-cultural experience of spending time in the outdoors with both friends and family. The number of waterfowl removed is not expected to have a detrimental impact on state populations, and waterfowl will still occur in locations available to hunters.

When damage caused by birds has occurred, any removal of birds by the property or resource owner would likely occur whether WS was involved with taking the birds or not. Therefore, the activities of WS are not expected to have any adverse cumulative impacts on this element of the human environment if occurring at the request of a property owner and/or manager. No significant cumulative impact is expected because the bird populations are a renewable resource and therefore will be replaced with new birds in the following years. The purpose of WS involvement is to alleviate the damage caused by the bird, not to manage populations. The impact on the aesthetic value of birds and the ability of the public to view and enjoy birds under the proposed action would be similar to the other alternatives and is likely insignificant.

Alternative 2 - Bird Damage Management by WS using only Nonlethal Methods

Under this alternative, WS would not conduct any lethal BDM, but may conduct harassment of birds that are causing damage. Other nonlethal methods may be conducted as well under this alternative to help alleviate damage caused by birds.

Direct, Indirect, and Cumulative Effects:
Although WS would not perform any lethal activities under this alternative, other private entities would likely conduct BDM activities similar to those that would no longer be conducted by WS, which means the direct and indirect effects would then be similar to the Proposed Action Alternative 1. Cumulative impacts are expected to be similar to Alternative 1.

Assuming property owners would choose to allow and pay for the implementation of nonlethal methods by WS, this alternative could result in birds relocating to other sites where they would likely cause or aggravate similar problems for other property owners. Thus, this alternative could result in more property owners experiencing adverse direct and/or indirect effects on the aesthetic value of their properties than the Proposed Action Alternative.

Alternative 3-No Bird Damage Management Conducted by WS

Under the no bird damage management by WS alternative, the actions of WS would have no impact on the aesthetic value of birds. Those persons experiencing damage or threats from birds would be responsible for researching, obtaining, and using all methods as permitted by federal, state, and local laws and regulations. The degree to which damage management activities would occur in the absence of assistance by any agency is unknown but likely lower compared to damage management activities that would occur where some level of assistance was provided. Birds could still be dispersed or removed under this alternative by those persons experiencing damage or threats of damage. Removal could also occur during the regulated harvest season, pursuant to the blackbird depredation order, pursuant to the Muscovy duck control order, and in the case of non-native species, removal could occur any time without the need for a depredation permit.

Direct, Indirect, and Cumulative Effects:
The potential direct and indirect effects on the aesthetic value of birds could be similar to the proposed action if similar levels of damage management activities are conducted by those persons experiencing damage or threats or is provided by other entities. If no action is taken or if activities are not permitted by the USFWS and the NYSDEC, then no direct or indirect effect on the aesthetic value of birds would occur under this alternative.

Since birds could continue to be removed under this alternative, despite WS' lack of involvement, the ability to view and enjoy birds would likely be similar to the other alternatives. The lack of WS' involvement would not lead to a reduction in the number of birds dispersed or removed since WS has no authority to regulate removal or the harassment of birds. The USFWS and the NYSDEC with management authority over birds would continue to adjust all removal levels based on population objectives for those bird species. Therefore, the number of birds lethally removed annually through hunting, under the depredation/control orders, and pursuant to depredation permits are regulated and adjusted by the USFWS and the NYSDEC. Therefore, the cumulative impacts to the aesthetic value of birds would be similar to the other alternatives.

3.2 ISSUES NOT CONSIDERED FOR COMPARATIVE ANALYSIS

Additional issues were identified by WS during the scoping process of this EA. Those issues were considered by WS and the USFWS; however, those issues will not be analyzed in detail for the reasons provided. 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, wetlands, visual resources,

air quality, prime and unique farmlands, aquatic resources, timber, and range. Those resources will not be analyzed further.

WS' Impact on Biodiversity

The WS program does not attempt to eradicate any species of native wildlife. WS operates in accordance with applicable federal and state laws and regulations enacted to ensure species viability. Methods available are employed to target individual birds or groups of birds identified as causing damage or posing a threat of damage. Any local reduction of birds would be temporary because immigration from adjacent areas or reproduction would replace the animals removed. WS operates on a small percentage of the land area of New York and would only target those birds identified as causing damage or posing a threat. Therefore, damage management activities conducted pursuant to any of the alternatives would not adversely affect biodiversity.

Humaneness of Methods to be Employed

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 and very complex concept that can be interpreted in a variety of ways. Schmidt (1989) indicated that vertebrate pest 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." Suffering is described as a "highly unpleasant emotional response usually associated with pain and distress." However, suffering "can occur without pain," and "pain can occur without suffering" (AVMA 2013). 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" (CDFG 1991), such as shooting.

Pain obviously occurs in animals, but assessing pain experienced by animals can be challenging (AVMA 2013, CDFG 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 hypoxia, depression by drugs, electric shock, or concussion, pain is not experienced.

The AVMA states "euthanasia is the act of inducing humane death in an animal" and that "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, "[f]or 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, "[w]hile 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 her or his responsibility to ensure that recommended methods and agents of euthanasia are preferentially used."

WS personnel are experienced and professional in their use of management methods so that they are as humane as possible under the constraints of current technology and funding. SOPs (Section 2.3) used to maximize humaneness are listed in this EA. As appropriate, WS euthanizes animals by following the AVMA guidelines AVMA (2013), whenever practicable or the recommendations of a veterinarian. Due to the status quo definition, animals will be removed from the environment even with the absence of WS operations. Therefore, WS' professional involvement would ensure that most humane methods are utilized.

WS and the NWRC are striving to bring additional nonlethal damage management alternatives into practical use and to improve the selectivity and humaneness of management devices. Until new findings and products are found practical, a certain amount of animal suffering could occur when some methods are used in situations when nonlethal damage management methods are not practical or effective. WS supports the most safe, humane, selective, and effective damage management techniques, and would continue to incorporate advances into management activities.

A Loss Threshold should be Established before Allowing Lethal Methods

One issue identified through WS' implementation of the NEPA processes is a concern that a threshold of loss should be established before employing lethal methods to resolve damage and that wildlife damage should be a cost of doing business. Some damage and economic loss can be tolerated by cooperators until the damage reaches a threshold where damage becomes an economic burden. The appropriate level of allowed tolerance or threshold before employing lethal methods would differ among cooperators and damage situations. In addition, establishing a threshold would be difficult or inappropriate to apply to human health and safety situations.

Bird Damage Management should not occur at Taxpayer Expense

Another issue previously identified is the concern that wildlife damage management should not be provided at the expense of the taxpayer or that activities should be fee-based. The WS program's funding for damage management activities is derived from federal appropriations and through cooperative funding. In rare circumstances, specific projects are entirely funded through federal appropriations. However, standard operations conducted for the management of damage and threats to human safety from birds would be primarily funded through cooperative service agreements with individual property owners or managers. A minimal federal appropriation would be used the maintenance of a WS program in New York. Technical assistance is provided to requesters as part of the federally funded activities, but all direct assistance in which WS' employees perform damage management activities is funded through cooperative service agreements between the requester and WS. The remainder of the WS program is entirely fee-based.

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 birds 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 circumstances where birds are causing damage or pose a threat. Additionally, management operations may be constrained by cooperator funding and/or objectives and needs.

Bird Damage should be Managed by Private Nuisance Wildlife Control Agents

Private nuisance wildlife control agents could be contacted to reduce bird damage for property owners 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, other government agencies, and cities and towns may prefer to use WS because of security and safety issues.

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 birds. As described in Appendix B, the lethal removal of birds with firearms by WS to alleviate damage or threats would occur using a 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). To address lead exposure from the use of shotguns, the standard conditions of depredation permits issued by the USFWS pursuant to the MBTA for the lethal removal of birds requires the use of non-toxic shot. To alleviate concerns associated with lead exposure in wildlife, WS would only use non-toxic shot as defined in 50 CFR 20.21(j) when using shotguns to remove all birds.

The removal of birds by WS would occur primarily from the use of shotguns. However, the use of rifles could be employed to lethally remove some species. Birds that were removed using rifles would occur within areas where retrieval of all bird carcasses for proper disposal would be highly likely (e.g., at roost sites). With risks of lead exposure occurring primarily from ingestion of lead shot and bullet fragments, the retrieval and proper disposal of bird carcasses would greatly reduce the risk of scavengers ingesting or being exposed to lead that may be contained within the carcass.

However, deposition of lead into soil could occur if, during the use of a rifle, the projectile passes through a bird, if misses occur, or if the bird 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 occur that lead from bullets deposited in soil from shooting activities could lead to contamination of 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 2013). 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. Stansley et al. (1992) believed the lead contamination near the parking lot was due to runoff from the lot, and not from the shooting range areas. The study also indicated that even when lead shot 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 harvest of birds can occur during regulated hunting seasons, through the issuance of depredation permits, under depredation orders without the need to obtain a depredation permit, or are considered non-native with no depredation permit required for removal, WS' assistance with removing birds would not be additive to the environmental status quo.

WS' assistance would not be additive to the environmental status quo since those birds 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 damage management

activities due to efforts by WS to ensure projectiles do no pass through, but are contained within, the bird carcass, which limits the amount of lead potentially deposited into soil from projectiles passing through the carcass. The proficiency training received by WS' employees in firearm use and accuracy increases the likelihood that birds 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 bird carcasses lethally removed using firearms would be retrieved and disposed of properly to limit the availability of lead in the environment and ensures bird carcass would be 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 could be deposited into the environment from WS' activities due to misses, the bullet passing through the carcass, or from bird carcasses that may be irretrievable would be below any level that would pose any risk from exposure or significant contamination of water. Additionally, WS' actions are not restricted to one small geographic area, but are spread out over the state, further reducing any impacts from lead in any one place.

3.3 SUMMARY OF IMPACTS

No significant cumulative environmental impacts are expected from any of the proposed actions analyzed in this supplement. Under the Current/Proposed Action, the lethal removal of birds by WS has not and would not have a significant impact on overall bird populations in New York or nationwide, but some local reductions may occur. No risk to public safety is expected under the proposed action since only trained and experienced wildlife biologists/specialists would conduct and recommend bird damage management activities. Although some persons will likely be opposed to WS' participation in bird damage management activities on public and private lands, the analysis in this EA indicates that a WS integrated bird damage management approach would not result in significant adverse cumulative impacts on the quality of the human environment.

CHAPTER 4 - LIST OF PREPARERS AND PERSONS/AGENCIES CONSULTED

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4.2 List of Cooperating Agencies

United States Department of the Interior, Fish and Wildlife Service
New York State Department of Environmental Conservation, Bureau of Wildlife
New York State Office of Parks, Recreation, and Historic Preservation
City of New York, Department of Environmental Protection
Port Authority of New York and New Jersey

4.3 List of Persons or Agencies Consulted

City of New York, Department of Parks and Recreation

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APPENDIX B - BIRD DAMAGE MANAGEMENT METHODS AVAILABLE FOR USE

NONLETHAL METHODS - NONCHEMICAL

Agricultural producer and property owner practices consist primarily of nonlethal preventive methods such as cultural methods and habitat modification. Cultural methods and other management techniques are implemented by the agricultural producer or property owners/managers. Resource owners/managers may be encouraged to use these methods, based on the level of risk, need, and professional judgment on their effectiveness and practicality.

Cultural methods may include altering planting dates so that crops are not young and more vulnerable to damage when the damage-causing species is present, or the planting of crops that are less attractive or less vulnerable to such species. At feedlots or dairies, cultural methods generally involve modifications to the level of care or attention given to livestock, which may vary depending on the age and size of the livestock. Animal husbandry practices include, but are not limited to, techniques such as night feeding, indoor feeding, closed barns or corrals, removal of spilled grain or standing water, and use of bird proof feeders (Johnson and Glahn 1994).

Environmental/Habitat modification can be an integral part of bird damage management. Wildlife production and/or presence are directly related to the type, quality, and quantity of suitable habitat. Therefore, habitat can be managed to reduce or eliminate the production or attraction of certain bird species or to repel certain birds. In most cases, the resource or property owner is responsible for implementing habitat modifications, and WS only provides advice on the type of modifications that have the best chance of achieving the desired effect. Habitat management is most often a primary component of bird damage management strategies at or near airports to reduce bird aircraft strike problems by eliminating bird nesting, roosting, loafing, or feeding sites. Generally, many bird problems on airport properties can be minimized through management of vegetation and water from areas adjacent to aircraft runways. Habitat management is often necessary to minimize damage caused by crows and blackbirds that form large roosts during late autumn and winter. Bird activity can be greatly reduced at roost sites by removing all the trees or selectively thinning the stand.

Animal behavior modification refers to tactics that alter the behavior of wildlife to reduce damage. Animal behavior modification may involve use of scare tactics or fencing to deter or repel animals that cause loss or damage (Twedt and Glahn 1982). Some, but not all, methods that are included by this category are bird-proof barriers, electronic guards, propane exploders, pyrotechnics, distress calls and sound producing devices, chemical frightening agents, repellents, scarecrows, mylar tape, lasers, and eye-spot balloons.

These techniques are generally only practical for small areas. Scaring devices such as distress calls, helium-filled eyespot balloons, raptor effigies and silhouettes, mirrors, and moving disks can be effective, but usually for only a short time before birds become accustomed and learn to ignore them (Arhart 1972, Rossbach 1975, Conover 1982, Schmidt and Johnson 1984, Mott 1985, Graves and Andelt 1987, Bomford 1990). Mylar tape has produced mixed results in its effectiveness to frighten birds (Dolbeer et al. 1986, Tobin et al. 1988).

Paintball guns are used as a nonlethal harassment method to disperse birds from areas using physical harassment. Paintballs are most often used to harass waterfowl. Paintballs can be used to produce physically and visually negative-reinforcing stimuli that can aid in the dispersal of birds from areas where damages or threats of damages are occurring.

Bird barriers can be effective, but are often cost-prohibitive, particularly because of the aerial mobility of birds, which requires overhead barriers as well as peripheral fencing or netting. Exclusion adequate to stop bird movements can also restrict movements of livestock, people and other wildlife (Fuller-Perrine and Tobin 1993). Netting can be used to exclude birds from a specific area by the placement of bird proof netting over and around the specific resource to be protected. Exclusion may be impractical in most settings (e.g., commercial agriculture), however it can be practical in small areas (e.g., personal gardens) or for high-value crops (e.g., grapes) (Johnson 1994). Although this alternative would provide short-term relief from damage, it may not completely deter birds from feeding, loafing, staging, or roosting at that site. A few people would find exclusionary devices such as netting unsightly, trashy, and cause a decreased aesthetic value of the neighborhood when used over personal gardens.

Overhead wire grids can deter bird use of specific areas where they are causing a nuisance (Johnson 1994). The birds apparently fear colliding with the wires and thus avoid flying into areas where the method has been employed. Overhead wire grids are more practical and cost effective than netting for large areas; for example, they can be used to keep waterfowl out of retention ponds on airfields.

Auditory scaring devices such as propane exploders, pyrotechnics, electronic guards, and audio distress/predator vocalizations are effective in many situations for dispersing damage-causing bird species. However, these devices are usually only effective for a short period of time before birds become accustomed and learn to ignore them (Arhart 1972, Rossbach 1975, Schmidt and Johnson 1984, Mott 1985, Bomford 1990). Williams (1983) reported an approximate 50% reduction in blackbirds at two south Texas feedlots as a result of pyrotechnics and propane cannon use. However, they are often not practical in dairy or feedlot situations because of the disturbance to livestock, although livestock can generally be expected to habituate to the noise. Birds, too, quickly learn to ignore scaring devices if the birds' fear of the methods is not reinforced with shooting or other tactics.

Visual scaring devises such as use of Mylar tape (highly reflective surface produces flashes of light that startles birds), eye-spot balloons (the large eyes supposedly give birds a visual cue that a large predator is present), flags, effigies (scarecrows), sometimes are effective in reducing bird damage. Mylar tape has produced mixed results in its effectiveness to frighten birds (Dolbeer et al. 1986, and Tobin et al. 1988). Birds quickly learn to ignore visual and other scaring devices if the birds' fear of the methods is not reinforced with shooting or other tactics.

Lasers are nonlethal devises evaluated by the NWRC (Glahn et al. 2000, Blackwell et al. 2002). For best results and to disperse numerous birds from a roost, the laser is most effectively used in periods of low light, such as after sunset and before sunrise. In the daytime, the laser can also be used during overcast conditions or in shaded areas to move individual and small numbers of birds, although the effective range of the laser is much diminished. Blackwell et al. (2002) tested lasers on several bird species and observed varied results among species. Lasers were ineffective at dispersing mallards with birds habituating in approximately 5 minutes and 20 minutes, respectively (Blackwell et al. 2002). As with other bird damage management tools lasers are most effective when used as part of an integrated management strategy.

Live traps are any trap that captures an animal without killing it. The animal can then be released or euthanized. In most situations, live trapped birds are subsequently euthanized. Translocation to other areas following live capture would not generally be effective because problem bird 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 bird damage problems at the new location. WS' policy regarding translocation (WS Directive 2.501) further discusses this management strategy.

Live traps include:

Decoy traps are used by WS for preventive and corrective damage management. Decoy traps are similar in design to the Australian crow trap as reported by McCracken (1972) and Johnson and Glahn (1994). Live decoy birds of the same species that are being targeted are placed in the trap with sufficient food and water to assure their survival and the survival of other trapped birds. Perches are configured in the trap to allow birds to roost above the ground and in a more natural position. Feeding behavior and calls of the decoy birds attract other birds, which enter and become trapped themselves. Active decoy traps are monitored daily to remove and euthanize excess birds and to replenish bait and water. Decoy traps and other cage/live traps, as applied and used by WS, pose no danger to pets or the public and if a pet is accidentally captured in such traps, it can be released unharmed.

Nest box traps may be used by WS for corrective damage management and are effective in capturing cavity nesting birds (DeHaven and Guarino 1969, Knittle and Guarino 1976).

Mist nets are more commonly used for capturing small-sized birds, but can be used to capture larger birds such as ducks and ring-neck pheasants or even smaller nuisance hawks and owls. It was introduced into the United States in the 1950s from Asia and the Mediterranean where it was used to capture birds for the market (Day et al. 1980). The mist net is a fine black silk or nylon net usually 3 to 10 feet wide and 25 to 35 feet long. Net mesh size determines which birds can be caught and overlapping pockets in the net cause birds to entangle themselves when they fly into the net.

Propelled nets are normally used for larger birds and use mortar projectiles to propel a net up and over birds, which have been baited to a particular site. Examples include, but are not limited to, rocket nets, cannon nets, pneumatic air cannons, and net guns.

Raptor traps are varied in form and function and include but are not limited to Bal-chatri, Dho Gaza traps, Phai hoop traps, bow nets, pole traps, and Swedish goshawk traps. These traps could be used specifically to live-trap raptors.

Drive traps (Corral traps) could be used to live-capture birds, primarily wild turkeys and other waterfowl. Corral traps can be effectively used to live capture geese during the annual molt when birds are unable to fly. Each year for a few weeks in the summer, geese are flightless as they are growing new flight feathers. Therefore, geese can be slowly guided into corral-traps.

Funnel traps or walk-in traps could be used to live-capture waterfowl. Traps are set up in shallow water and baited. Funnel traps allow waterfowl to enter the trap but prevent the ducks from exiting. Traps would be checked regularly to address live-captured waterfowl. Captured ducks can be relocated or euthanized.

Lure crops/alternate foods. When damage cannot be avoided by careful crop selection or modified planting schedules, lure crops can sometimes be used to mitigate the loss potential. Lure crops are planted or left for consumption by wildlife as an alternative food source. This approach provides relief for critical crops by sacrificing less important or specifically planted fields. Establishing lure crops is sometimes expensive, requires considerable time and planning to implement, and may attract other unwanted species to the area.

Resource Management includes a variety of practices that may be used by resource owners to reduce the potential for wildlife damage. Implementation of these practices is appropriate when the potential for damage can be reduced without significantly increasing a resource owner's costs or diminishing his/her ability to manage resources pursuant to goals. Resource management recommendations are made through WS technical assistance efforts.

NONLETHAL METHODS - CHEMICAL

Avitrol is a chemical frightening agent (repellent) that is effective in a single dose when mixed with untreated baits, normally in a 1:9 ratio. Avitrol, however, is not completely nonlethal in that a small portion of the birds are generally killed (Johnson and Glahn 1994). Prebaiting is usually necessary to achieve effective bait acceptance by the target species. This chemical is registered for use on pigeons, crows, blackbirds, starlings, grackles, cowbirds, and house sparrows in various situations. Avitrol treated bait is placed in an area where the targeted birds are feeding. When a treated particle is consumed, affected birds begin to broadcast distress vocalizations and display abnormal flying behavior, thereby frightening the remaining flock away.

Avitrol is a restricted-use pesticide that can only be sold to certified applicators and is available in several bait formulations where only a small portion of the individual grains carry the chemical. It can be used during anytime of the year, but is used most often during winter and spring. Any granivorous bird associated with the target species could be affected by Avitrol. Avitrol is water soluble, but laboratory studies demonstrated that Avitrol is strongly absorbed onto soil colloids and has moderately low mobility. Biodegradation is expected to be slow in soil and water, with a half-life ranging from three to 22 months. However, Avitrol may form covalent bonds with humic materials, which may serve to

reduce its availability for intake by organisms from water, is non-accumulative in tissues and rapidly metabolized by many species (Schafer, Jr. 1991).

Avitrol is acutely toxic to avian and mammalian species, however, blackbirds are more sensitive to the chemical and there is little evidence of chronic toxicity. Laboratory studies with predator and scavenger species have shown minimal potential for secondary poisoning and during field use only magpies and crows appear to have been affected (Schafer, Jr. 1991). However, a laboratory study by Schafer, Jr. et al. (1974) showed that magpies exposed to two to 3.2 times the published LD_{50} in contaminated prey for 20 days were not adversely affected and three American kestrels that were fed contaminated blackbirds for seven to 45 days were not adversely affected. Some hazards may occur to predatory species consuming unabsorbed chemical in the GI tract of affected or dead birds (Schafer, Jr. 1981, Holler and Shafer 1982).

Methyl anthranilate (artificial grape flavoring used in foods and soft drinks for human consumption) could be used or recommended by WS as a bird repellent. Methyl anthranilate has been shown to be a promising repellent for many bird species, including waterfowl (Dolbeer et al. 1993). Cummings et al. (1995) found effectiveness of MA declined significantly after 7 days. Belant et al. (1996) found MA ineffective as a bird grazing repellent, even when applied at triple the recommended label rate. MA is also under investigation as a potential bird taste repellent and may become available for use as a livestock feed additive (Mason et al. 1984, Mason et al. 1989). It is registered for applications to turf or to surface water areas used by unwanted birds. The material has been shown to be nontoxic to bees (LD_{50} > 25 micrograms/bee[8]), nontoxic to rats in an inhalation study (LC_{50} > 2.8 mg/L[9]), and of relatively low toxicity to fish and other invertebrates. Methyl anthranilate is naturally occurring in concord grapes and in the blossoms of several species of flowers and is used as a food additive and perfume ingredient (Dolbeer et al. 1992). It has been listed as "*Generally Recognized as Safe*" by the U.S. Food and Drug Administration (Dolbeer et al. 1992).

Water surface and turf applications of MA are generally considered expensive. For example, the least intensive application rate required by label directions is 20 lbs. of product (8 lbs. active ingredient) per acre of surface water at a cost of about $64/lb. with retreating required every 3-4 weeks. Cost of treating turf areas would be similar on a per acre basis. In addition, MA completely degrades in about 3 days when applied to water, which indicates the repellent effect is short-lived.

Another potentially more cost effective method of MA application is by use of a fog-producing machine (Vogt 1997). The fog drifts over the area to be treated and is irritating to the birds, while being non-irritating to any humans that might be exposed. Fogging applications must generally be repeated 3-5 times after the initial treatment before the birds abandon a treatment site. Applied at a rate of about 0.25 lb/acre of water surface, the cost is considerably less than when using the turf or water treatment methods.

MA is also being investigated as a livestock feed additive to reduce or prevent feed consumption by birds. Such chemicals undergo rigorous testing and research to prove safety, effectiveness, and low environmental risks before they would be registered by EPA or the FDA.

Tactile repellents. A number of tactile repellent products are on the market which reportedly deters birds from roosting on certain structural surfaces by presenting a tacky or sticky surface that the birds avoid. This tacky substance would be applied on the top of a specific perching location in order to make that location undesirable. However, experimental data in support of this claim are sparse (Mason and Clark 1992). The repellency of tactile products is generally short-lived because of dust, and they sometimes cause aesthetic problems and expensive clean-up costs by running down the sides of buildings in hot weather.

[8]An LD_{50} is the dosage in milligrams of material per kilogram of body weight, or, in this case in micrograms per individual bee, required to cause death in 50% of a test population of a species.
[9]An LC_{50} is the dosage in milligrams of material per liter of air required to cause death in 50% of a test population of a species through inhalation.

APPENDIX B - BIRD DAMAGE MANAGEMENT METHODS AVAILABLE FOR USE

LETHAL METHODS – NON-CHEMICAL

Shooting is more effective as a dispersal technique than as a way to reduce bird densities when large numbers of birds are present. Normally shooting is conducted with shotguns, rifles or air rifles. Shooting is a very individual specific method and is normally used to remove a single offending bird. However, at times, a few birds could be shot from a flock to make the remainder of the birds more wary and to help reinforce nonlethal methods. It is selective for target species and may be used in conjunction with the use of spotlights, decoys, and calling. Shooting with shotguns, air rifles, or rim and center fire rifles is sometimes used to manage bird damage problems when lethal methods are determined to be appropriate. The birds are killed as quickly and humanely as possible. All firearm safety precautions are followed by WS when conducting bird damage management activities and all laws and regulations governing the lawful use of firearms are strictly complied with.

Firearm use is very sensitive and a public concern because of safety issues relating to the public and misuse. To ensure safe use and awareness, WS' employees who use firearms to conduct official duties are required to attend an approved firearms safety and use training program within 3 months of their appointment and a refresher course every year afterwards (WS Directive 2.615). WS' employees, who carry firearms as a condition of employment, are required to sign a form certifying that they meet the criteria as stated in the *Lautenberg Amendment,* which prohibits firearm possession by anyone who has been convicted of a misdemeanor crime of domestic violence.

Sport hunting is sometimes recommended by WS as a viable damage management method when the target species can be legally hunted. A valid hunting license and other licenses or permits may be required by the NYSDEC and the USFWS for certain species. This method provides sport and food for hunters and requires no cost to the landowner. Sport hunting is occasionally recommended if it can be conducted safely for crow damage management around crops or other resources.

Cervical dislocation is sometimes used to euthanize birds which are captured in live traps. The bird is stretched and the neck is hyper-extended and dorsally twisted to separate the first cervical vertebrae from the skull. The AVMA approves this technique as a humane method of euthanasia and states that cervical dislocation when properly executed is a humane technique for euthanasia of poultry and other small birds (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).

Snap traps are modified rat snap traps used to remove individual woodpeckers and other cavity using birds. The trap treadle is baited with peanut butter or other food attractants and attached near the damage area caused by the offending bird. These traps pose no imminent danger to pets or the public, and are usually located in positions inaccessible to people and most non-avian animals. They are very selective because they are usually set in the defended territory of the target birds.

Nest/egg destruction. Nest/egg destruction is the removal of nesting materials and eggs during the construction phase of the nesting cycle. Nest destruction is generally only applied when dealing with a single bird or very few birds. This method is used to discourage birds from constructing nests in areas, which may create nuisances or safety issues for home and business owners. Removal of nests is intended to deter birds from nesting in the same area again. Birds generally attempt to re-nest, so the method may need to be conducted repeatedly throughout the nesting season, and over several years. Heusmann and Bellville (1978) reported that nest removal was an effective, but time-consuming, method because problem bird species are highly mobile and can easily return to damage sites from long distances, or because of high populations. This method poses no imminent danger to pets or the public.

Non-chemical egg treatment (addling/shaking, puncturing) is a method of suppressing reproduction in local nuisance goose populations by destroying egg embryos to arrest their development and eliminate hatching. Treated eggs are returned to the nest and the adult geese remain attached to the nest site. Treatment of eggs will not reduce the overall

problem bird population, but may slow its growth and make adult birds more responsive to harassment (also see *Egg oiling* below).

LETHAL METHODS - CHEMICAL

All chemicals used by WS are registered as required by the FIFRA. WS' personnel that use restricted-use chemical methods are certified as pesticide applicators by the State of New York and are required to adhere to all certification requirements set forth in FIFRA and New York pesticide control laws and regulations. Chemicals are only used on private, public, or tribal property sites with authorization from the property owner/manager.

CO_2 is sometimes used to euthanize birds which are captured in live traps. Live birds are placed in a container such as a plastic 5-gallon bucket or chamber and sealed shut. CO_2 gas is released into the bucket or chamber and birds quickly die after inhaling the gas. This method is approved as a euthanizing agent by the AVMA (Beaver et al. 2001). 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.

DRC-1339 is registered for use by WS for management of damage associated with rock pigeons, red-winged blackbirds, brown-headed cowbirds, common grackles, boat-tailed grackles, European starlings, American crows, fish crows, common ravens, herring gulls, great black-backed gulls, laughing gulls, ring-billed gulls, and other birds. Use of this pesticide is limited to commercial animal operations, staging areas, gull colonies, and gull feeding or loafing sites.

DRC -1339 has proven to be an effective method of starling, blackbird, gull, and pigeon control at feedlots, dairies, airports, and in urban areas (DeCino et al. 1966, Besser et al. 1967, West et al. 1967). Studies continue to document the effectiveness of DRC-1339 in resolving blackbird/starling problems at feedlots (West and Besser 1976, Glahn 1981, Glahn et al. 1987), and dispersing crow roosts in urban/suburban areas (Boyd and Hall 1987). Glahn and Wilson (1992) noted that baiting with DRC-1339 is a cost-effective method of reducing damage by blackbirds to sprouting rice.

DRC-1339 is a slow acting avicide that is registered with the EPA for reducing damage from several species of birds, including blackbirds, starlings, pigeons, crows, ravens, magpies, and gulls. DRC-1339 was developed as an avicide because of its differential toxicity to mammals. DRC-1339 is highly toxic to sensitive species but only slightly toxic to non-sensitive birds, predatory birds, and mammals (Schafer, Jr. 1981, Schafer, Jr. 1991, Johnston et al. 1999). For example, starlings, a highly sensitive species, require a dose of only 0.3 mg/bird to cause death (Royall et al. 1967). Most bird species that are responsible for damage, including starlings, blackbirds, pigeons, crows, magpies, and ravens are highly sensitive to DRC-1339. Many other bird species such as raptors (Schafer, Jr. 1981), sparrows, and eagles are classified as non-sensitive. Numerous studies show that DRC-1339 poses minimal risk of primary poisoning to non-target and T&E species (EPA 1995). Secondary poisoning has not been observed with DRC-1339 treated baits, except crows eating gut contents of pigeons (Kreps 1974). During research studies, carcasses of birds which died from DRC-1339 were fed to raptors and scavenger mammals for 30 to 200 days with no symptoms of secondary poisoning observed (Cunningham et al. 1979). This can be attributed to relatively low toxicity to species that might scavenge on blackbirds and starlings killed by DRC-1339 and its tendency to be almost completely metabolized in the target birds which leaves little residue to be ingested by scavengers. Secondary hazards of DRC-1339 are almost nonexistent (Schafer, Jr. 1984, Schafer, Jr. 1991, Johnston et al. 1999). DRC-1339 acts in a humane manner producing a quiet and apparently painless death.

DRC-1339 is unstable in the environment and degrades rapidly when exposed to sunlight, heat, or ultra violet radiation. DRC-1339 is highly soluble in water but does not hydrolyze and degradation occurs rapidly in water. DRC-1339 tightly binds to soil and has low mobility. The half-life is about 25 hours, which means it is nearly 100% broken down within a week, and identified metabolites (*i.e.*, degradation chemicals) have low toxicity. Although DRC-1339 is highly toxic to aquatic invertebrates (EPA 1995), following labeling requirements eliminates the risks to non-target mussel species.

These label requirements include application more than 50 feet from a body of water, observation, and pre-baiting to ensure the rapid uptake of treated bait by the target bird species.

Egg oiling is a chemical form of egg treatment in which the eggs are coated in corn oil. The oil prevents exchange of gases and causes asphyxiation of developing embryos and has been found to be 96-100% effective in reducing hatchability (Pochop 1998, Pochop et al. 1998). The method has an advantage over nest or egg destruction in that the incubating geese generally continue incubation and do not re-nest. To be most effective, the oil should be applied anytime between the fifth day after the laying of the last egg in a nest and at least five days before anticipated hatching. This method is extremely target specific. The EPA has ruled that use of corn oil for this purpose is exempt from registration requirements under FIFRA. In New York State, corn oil is required to be listed as a 25(b) and is required to be appropriately labeled. Pesticide certification is not required for the use of corn oil on cormorant eggs.

APPENDIX C: FEDERALLY LISTED THREATENED AND ENDANGERED SPECIES CONSULTATION WITH USFWS

Species	Counties	Habitat Characteristics	Relevant Information	Methods for Resolving Bird Damage, and Their Effects	Overall 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.	• No work is proposed in wetlands.	• Technical assistance: **No effect** *(i.e. recommendation of legal hunting, physical exclusion, habitat modificatio*n) • Paintball guns: **No effect** • Bird barriers: **No effect** • Audio scaring: **No effect** • Visual scaring: **No effect** • Lasers: **No effect** • Chemical repellents: **No effect** • Live traps: **No effect** • Live capture and euthanasia: **No effect** • Lethal traps: **No effect** • Shooting: **No effect** • Lethal chemicals: **No effect** • Nest/ egg destruction: **No effect**	• **No effect**
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.	• 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 birds 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. Any impacts are anticipated to be insignificant.	• Technical assistance: **No effect** *(i.e. recommendation of legal hunting, physical exclusion, habitat modificatio*n) • Paintball guns: **No effect** • Bird barriers: **No effect** • Audio scaring: **May affect, but not likely to adversely affect** • Visual scaring: **No effect** • Lasers: **No effect** • Chemical repellents: **No effect** • Live traps: **No effect** • Live capture and euthanasia: **No effect** • Lethal traps: **No effect** • Shooting: (noise) **May affect, but not likely to adversely affect** • Lethal chemicals: **No effect** • Nest/ egg destruction: **No effect**	• **May affect, but not likely to adversely affect**
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.	• Karner blue butterflies are known to occur at the Albany Landfill. However, no work is proposed on the Albany Landfill cap. • Karner blue butterflies are known to occur at the Saratoga County Airport. However, APHIS does not conduct any work at the Airport that would result in impacts and the Federal Aviation Administration is the lead federal agency.	• Technical assistance: **No effect** *(i.e. recommendation of legal hunting, physical exclusion, habitat modificatio*n) • Paintball guns: **No effect** • Bird barriers: **No effect** • Audio scaring: **No effect**	• **No effect**

Species	Counties	Habitat Characteristics	Relevant Information	Methods for Resolving Bird Damage, and Their Effects	Overall Determination
			• No work is proposed in any other areas with Karner blue butterflies.	• Visual scaring: **No effect** • Lasers: **No effect** • Chemical repellents: **No effect** • Live traps: **No effect** • Live capture and euthanasia: **No effect** • Lethal traps: **No effect** • Shooting: (predator) **No effect** • Lethal chemicals: **No effect** Nest/ egg destruction: **No effect**	
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.	• No activities are proposed in rivers, streams or creeks.	• Technical assistance: **No effect** *(i.e. recommendation of legal hunting, physical exclusion, habitat modificatio*n) • Paintball guns: **No effect** • Bird barriers: **No effect** • Audio scaring: **No effect** • Visual scaring: **No effect** • Lasers: **No effect** • Chemical repellents: **No effect** • Live traps: **No effect** • Live capture and euthanasia: **No effect** • Lethal traps: **No effect** • Shooting: **No effect** • Lethal chemicals: **No effect** • Nest/ egg destruction: **No effect**	**No effect**
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.	• No activities are proposed in rivers, streams or creeks.	• Technical assistance: **No effect** *(i.e. recommendation of legal hunting, physical exclusion, habitat modificatio*n) • Paintball guns: **No effect** • Bird barriers: **No effect** • Audio scaring: **No effect** • Visual scaring: **No effect** • Lasers: **No effect** • Chemical repellents: **No effect** • Live traps: **No effect** • Live capture and euthanasia: **No effect** • Lethal traps: **No effect** • Shooting: **No effect** • Lethal chemicals: **No effect** • Nest/ egg destruction: **No effect**	**No effect**

Species	Counties	Habitat Characteristics	Relevant Information	Methods for Resolving Bird Damage, and Their Effects	Overall Determination
Houghton's goldenrod (T) (plant) *Solidago houghtonii*	Genesee	• One known occurrence in NY in a wetland habitat.	• No activities are proposed in wetlands.	• Technical assistance: **No effect** *(i.e. recommendation of legal hunting, physical exclusion, habitat modificatio*n) • Paintball guns: **No effect** • Bird barriers: **No effect** • Audio scaring: **No effect** • Visual scaring: **No effect** • Lasers: **No effect** • Chemical repellents: **No effect** • Live traps: **No effect** • Live capture and euthanasia: **No effect** • Lethal traps: **No effect** • Shooting: **No effect** • Lethal chemicals: **No effect** • Nest/ egg destruction: **No effect**	• **No effect**
Northern wild monkshood (T) (plant) *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.	• No activities are proposed in suitable NWM habitat.	• Technical assistance: **No effect** *(i.e. recommendation of legal hunting, physical exclusion, habitat modificatio*n) • Paintball guns: **No effect** • Bird barriers: **No effect** • Audio scaring: **No effect** • Visual scaring: **No effect** • Lasers: **No effect** • Chemical repellents: **No effect** • Live traps: **No effect** • Live capture and euthanasia: **No effect** • Lethal traps: **No effect** • Shooting: **No effect** • Lethal chemicals: **No effect** • Nest/ egg destruction: **No effect**	• **No effect**
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	• No activities are proposed in wetlands.	• Technical assistance: **No effect** *(i.e. recommendation of legal hunting, physical exclusion, habitat modificatio*n) • Paintball guns: **No effect** • Bird barriers: **No effect** • Audio scaring: **No effect** • Visual scaring: **No effect**	• **No effect**

Species	Counties	Habitat Characteristics	Relevant Information	Methods for Resolving Bird Damage, and Their Effects	Overall Determination
		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.		• Lasers: **No effect** • Chemical repellents: **No effect** • Live traps: **No effect** • Live capture and euthanasia: **No effect** • Lethal traps: **No effect** • Shooting: **No effect** • Lethal chemicals: **No effect** • Nest/ egg destruction: **No effect**	
Eastern prairie fringed orchid (T) (Historic) (plant) *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.	• Technical assistance: **No effect** *(i.e. recommendation of legal hunting, physical exclusion, habitat modificatio*n) • Paintball guns: **No effect** • Bird barriers: **No effect** • Audio scaring: **No effect** • Visual scaring: **No effect** • Lasers: **No effect** • Chemical repellents: **No effect** • Live traps: **No effect** • Live capture and euthanasia: **No effect** • Lethal traps: **No effect** • Shooting: **No effect** • Lethal chemicals: **No effect** • Nest/ egg destruction: **No effect**	• **No effect**
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.	• Occurrences of working in these habitats would be unlikely and therefore impacts would be discountable. • Wildlife Services does not have a history of conducting work in coastal beach environments, but it is not outside the realm of possibility. • Wildlife Services biologists are trained in bird identification and are aware of locations where the species breeds. • 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 to identify locations of roseate terns.	• Technical assistance: **No effect** *(i.e. recommendation of legal hunting, physical exclusion, habitat modificatio*n) • Paintball guns: **No effect** • Bird barriers: **No effect** • Audio scaring: **May affect** • Visual scaring: **May affect** • Lasers: **No effect** • Chemical repellents: **No effect** • Live traps: **No effect** • Live capture and euthanasia: **No effect** • Lethal traps: **No effect** • Shooting: (noise) **May affect** • Lethal chemicals: **No effect** • Nest/ egg destruction: **No effect**	• **May affect, but not likely to adversely affect**

APPENDIX C: FEDERALLY LISTED THREATENED AND ENDANGERED SPECIES CONSULTATION WITH USFWS

Species	Counties	Habitat Characteristics	Relevant Information	Methods for Resolving Bird Damage, and Their Effects	Overall Determination
Piping plover (T) (Endangered in the Great Lakes watershed) *Charadrius melodus*	Bronx, Nassau, Queens, Suffolk, Jefferson, Oswego	• 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.	• Occurrences of working in these habitats would be unlikely and therefore impacts would be discountable. • Wildlife Services does not have a history of conducting work in coastal beach environments, but it is not outside the realm of possibility. • Wildlife Services biologists are trained in bird species and nest identification, and are aware of locations where this species breeds. • Along the eastern shore of Lake Ontario and in other areas where piping plovers occur, bird damage management is implemented in parks, golf courses, and on other manicured lawns which does not overlap with piping plover nesting habitat. Wildlife Services would not enter restricted nesting areas for this or any species. • Wildlife Services will coordinate with USFWS Long Island or New York field office for any projects anticipated to impact this species or their habitat. • Wildlife Services will consult USFWS iPaC and/or NYSDEC mapper to identify locations of piping 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.	• Technical assistance: **No effect** *(i.e. recommendation of legal hunting, physical exclusion, habitat modification*) • Paintball guns: **No effect** • Bird barriers: **No effect** • Audio scaring: **May affect** • Visual scaring: **May affect** • Lasers: **No effect** • Chemical repellents: **No effect** • Live traps: **No effect** • Live capture and euthanasia: **No effect** • Lethal traps: **No effect** • Shooting: (noise) **May affect** • Lethal chemicals: **No effect** • Nest/ egg destruction: **No effect**	• **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.	• Technical assistance: **No effect** *(i.e. recommendation of legal hunting, physical exclusion, habitat modification*) • Paintball guns: **No effect** • Bird barriers: **No effect** • Audio scaring: **No effect** • Visual scaring: **No effect** • Lasers: **No effect** • Chemical repellents: **No effect** • Live traps: **No effect** • Live capture and euthanasia: **No effect** • Lethal traps: **No effect** • Shooting: **No effect** • Lethal chemicals: **No effect** • Nest/ egg destruction: **No effect**	• **No effect**

Species	Counties	Habitat Characteristics	Relevant Information	Methods for Resolving Bird Damage, and Their Effects	Overall 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.	• Technical assistance: **No effect** *(i.e. recommendation of legal hunting, physical exclusion, habitat modificatio*n) • Paintball guns: **No effect** • Bird barriers: **No effect** • Audio scaring: **No effect** • Visual scaring: **No effect** • Lasers: **No effect** • Chemical repellents: **No effect** • Live traps: **No effect** • Live capture and euthanasia: **No effect** • Lethal traps: **No effect** • Shooting: **No effect** • Lethal chemicals: **No effect** • Nest/ egg destruction: **No effect**	**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.	• Occurrences of working in these habitats would be unlikely and therefore impacts would be discountable. • Wildlife Services does not have a history of conducting work in coastal beach environments, but it is not outside the realm of possibility. • 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 and: • Between May 1 and November 1, Wildlife Services would coordinate with landowners in sandplain gerardia habitat, conduct pre-project surveys to determine specific locations of plants, and create symbolic fencing with 10 ft. diameter spacing around individual plants or plant colonies.	• Technical assistance: **No effect** *(i.e. recommendation of legal hunting, physical exclusion, habitat modificatio*n) • Paintball guns: **No effect** • Bird barriers: **No effect** • Audio scaring: **No effect** • Visual scaring: **No effect** • Lasers: **No effect** • Chemical repellents: **No effect** • Live traps: **No effect** • Live capture and euthanasia: **No effect** • Lethal traps: **No effect** • Shooting: **No effect** • Lethal chemicals: **No effect** • Nest/ egg destruction: **No effect**	• **No effect**

Species	Counties	Habitat Characteristics	Relevant Information	Methods for Resolving Bird Damage, and Their Effects	Overall Determination
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 forested habitats in Orange County, New York.	• Technical assistance: **No effect** *(i.e. recommendation of legal hunting, physical exclusion, habitat modificatio*n) • Paintball guns: **No effect** • Bird barriers: **No effect** • Audio scaring: **No effect** • Visual scaring: **No effect** • Lasers: **No effect** • Chemical repellents: **No effect** • Live traps: **No effect** • Live capture and euthanasia: **No effect** • Lethal traps: **No effect** • Shooting: **No effect** • Lethal chemicals: **No effect** • Nest/ egg destruction: **No effect**	• **No effect**
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.	• Occurrences of working in these habitats would be unlikely and therefore impacts would be discountable. • Wildlife Services does not have a history of conducting work in coastal beach environments, but it is not outside the realm of possibility. • Wildlife Services will consult USFWS iPaC and/or the NYSDEC mapper at to identify locations of seabeach amaranth. • Wildlife Services would also contact the USFWS environmental staff for projects within seabeach amaranth habitat and: • Between May 1 and November 1, Wildlife Services would coordinate with landowners in seabeach amaranth habitat, conduct pre-project surveys to determine specific locations of plants, and create symbolic fencing with 10 ft. diameter spacing around individual plants or plant colonies.	• Technical assistance: **No effect** *(i.e. recommendation of legal hunting, physical exclusion, habitat modificatio*n) • Paintball guns: **No effect** • Bird barriers: **No effect** • Audio scaring: **No effect** • Visual scaring: **No effect** • Lasers: **No effect** • Chemical repellents: **No effect** • Live traps: **No effect** • Live capture and euthanasia: **No effect** • Lethal traps: **No effect** • Shooting: **No effect** • Lethal chemicals: **No effect** • Nest/ egg destruction: **No effect**	• **No effect**
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.	• Technical assistance: **No effect** *(i.e. recommendation of legal hunting, physical exclusion, habitat modificatio*n) • Paintball guns: **No effect** • Bird barriers: **No effect** • Audio scaring: **No effect** • Visual scaring: **No effect**	• **No effect**

Species	Counties	Habitat Characteristics	Relevant Information	Methods for Resolving Bird Damage, and Their Effects	Overall Determination
				• Lasers: **No effect** • Chemical repellents: **No effect** • Live traps: **No effect** • Live capture and euthanasia: **No effect** • Lethal traps: **No effect** • Shooting: **No effect** • Lethal chemicals: **No effect** • Nest/ egg destruction: **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.	• Wildlife Services does not anticipate conducting bird damage management in forested areas where northeastern bulrush exists.	• Technical assistance: **No effect** *(i.e. recommendation of legal hunting, physical exclusion, habitat modificatio*n) • Paintball guns: **No effect** • Bird barriers: **No effect** • Audio scaring: **No effect** • Visual scaring: **No effect** • Lasers: **No effect** • Chemical repellents: **No effect** • Live traps: **No effect** • Live capture and euthanasia: **No effect** • Lethal traps: **No effect** • Shooting: **No effect** • Lethal chemicals: **No effect** • Nest/ egg destruction: **No effect**	• **No effect**
Kemp's [=Atlantic] ridley sea turtle (E) *Lepidochelys kempi*	Queens	• Primarily occupy "neritic" habitats. Neritic zones typically contain muddy or sandy bottoms where prey can be found. • Nesting has been documented at Rockaway Beach.	• Management activities for birds are not expected to occur in habitats used by Kemp's ridley sea turtles. • Occurrences of working in these habitats would be unlikely and therefore impacts would be discountable. • Wildlife Services does not have a history of conducting work in coastal beach environments, but it is not outside the realm of possibility. • Wildlife Services will consult USFWS iPaC and/or the NYSDEC mapper at to identify locations of Kemp's ridley nesting habitat. • Wildlife Services would also contact the USFWS environmental staff for projects within Kemp's ridley nesting habitat and consult separately on activities that may result in trampling of nests or use of lighting.	• Technical assistance: **No effect** *(i.e. recommendation of legal hunting, physical exclusion, habitat modificatio*n) • Paintball guns: **No effect** • Bird barriers: **No effect** • Audio scaring: **May affect** • Visual scaring: **May affect** • Lasers: **No effect** • Chemical repellents: **No effect** • Live traps: **No effect** • Live capture and euthanasia: **No effect** • Lethal traps: **No effect** • Shooting: **No effect** • Lethal chemicals: **No effect** • Nest/ egg destruction: **No effect**	• **May affect, not likely to adversely affect**

APPENDIX C: FEDERALLY LISTED THREATENED AND ENDANGERED SPECIES CONSULTATION WITH USFWS

Species	Counties	Habitat Characteristics	Relevant Information	Methods for Resolving Bird Damage, and Their Effects	Overall Determination
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 birds are not expected to occur in habitats used by green sea turtles.	• Technical assistance: **No effect** *(i.e. recommendation of legal hunting, physical exclusion, habitat modificatio*n) • Paintball guns: **No effect** • Bird barriers: **No effect** • Audio scaring: **No effect** • Visual scaring: **No effect** • Lasers: **No effect** • Chemical repellents: **No effect** • Live traps: **No effect** • Live capture and euthanasia: **No effect** • Lethal traps: **No effect** • Shooting: **No effect** • Lethal chemicals: **No effect** • Nest/ egg destruction: **No effect**	• **No effect**
Hawksbill sea turtle (E) *Eretmochelys imbricate*	Kings, Nassau, Queens, Richmond, Suffolk	• Ledges and caves of coral reefs.	Management activities for birds are not expected to occur in habitats used by hawksbill sea turtle.	• Technical assistance: **No effect** *(i.e. recommendation of legal hunting, physical exclusion, habitat modificatio*n) • Paintball guns: **No effect** • Bird barriers: **No effect** • Audio scaring: **No effect** • Visual scaring: **No effect** • Lasers: **No effect** • Chemical repellents: **No effect** • Live traps: **No effect** • Live capture and euthanasia: **No effect** • Lethal traps: **No effect** • Shooting: **No effect** • Lethal chemicals: **No effect** • Nest/ egg destruction: **No effect**	• **No effect**
Leatherback sea turtle (E) *Dermochelys coriacea*	Kings, Nassau, Queens, Richmond, Suffolk	• Primarily open ocean, but does forage in coastal waters.	• Management activities for birds are not expected to occur in habitat used by leatherback sea turtles.	• Technical assistance: **No effect** *(i.e. recommendation of legal hunting, physical exclusion, habitat modificatio*n) • Paintball guns: **No effect** • Bird barriers: **No effect** • Audio scaring: **No effect** • Visual scaring: **No effect**	• **No effect**

Species	Counties	Habitat Characteristics	Relevant Information	Methods for Resolving Bird Damage, and Their Effects	Overall Determination
				• Lasers: **No effect** • Chemical repellents: **No effect** • Live traps: **No effect** • Live capture and euthanasia: **No effect** • Lethal traps: **No effect** • Shooting: **No effect** • Lethal chemicals: **No effect** • Nest/ egg destruction: **No effect**	
Loggerhead sea turtle (T) *Caretta caretta*	Currently not believed to breed in New York.	• Nests on beaches. • Forages in coastal waters.	• Management activities for birds are not expected to occur in habitat used by loggerhead sea turtles.	• Technical assistance: **No effect** *(i.e. recommendation of legal hunting, physical exclusion, habitat modificatio*n) • Paintball guns: **No effect** • Bird barriers: **No effect** • Audio scaring: **No effect** • Visual scaring: **No effect** • Lasers: **No effect** • Chemical repellents: **No effect** • Live traps: **No effect** • Live capture and euthanasia: **No effect** • Lethal traps: **No effect** • Shooting: **No effect** • Lethal chemicals: **No effect** • Nest/ egg destruction: **No effect**	• **No effect**
Eastern massasauga rattlesnake (T) *Sistrurus catenatus*	Genesee, Onondaga	• Wet prairie, bogs, and swamps. • Marshes and floodplain open areas in wetlands with elevated hummocks for basking.	• No work is proposed in wetlands.	• Technical assistance: **No effect** *(i.e. recommendation of legal hunting, physical exclusion, habitat modificatio*n) • Paintball guns: **No effect** • Bird barriers: **No effect** • Audio scaring: **No effect** • Visual scaring: **No effect** • Lasers: **No effect** • Chemical repellents: **No effect** • Live traps: **No effect** • Live capture and euthanasia: **No effect** • Lethal traps: **No effect** • Shooting: **No effect** • Lethal chemicals: **No effect** • Nest/ egg destruction: **No effect**	• **No effect**

Species	Counties	Habitat Characteristics	Relevant Information	Methods for Resolving Bird Damage, and Their Effects	Overall Determination
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 birds 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.	• Technical assistance: **No effect** *(i.e. recommendation of legal hunting, physical exclusion, habitat modificatio*n) • Paintball guns: **No effect** • Bird barriers: **No effect** • Audio scaring: **May affect, but not likely to adversely affect** • Visual scaring: **No effect** • Lasers: **No effect** • Chemical repellents: **No effect** • Live traps: **No effect** • Live capture and euthanasia: **No effect** • Lethal traps: **No effect** • Shooting: (noise) **May affect, but not likely to adversely affect** • Lethal chemicals: **No effect** • Nest/ egg destruction: **No effect**	• **May affect, but not likely to adversely affect**

APPENDIX C: FEDERALLY LISTED THREATENED AND ENDANGERED SPECIES CONSULTATION WITH USFWS

Species	Counties	Habitat Characteristics	Relevant Information	Methods for Resolving Bird Damage, and Their Effects	Overall 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.	• Occurrences of working in these habitats would be unlikely and therefore impacts would be discountable. • 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.	• Technical assistance: **No effect** *(i.e. recommendation of legal hunting, physical exclusion, habitat modificatio*n) • Paintball guns: **No effect** • Bird barriers: **No effect** • Audio scaring: **May affect** • Visual scaring: **May affect** • Lasers: **No effect** • Chemical repellents: **No effect** • Live traps: **No effect** • Live capture and euthanasia: **No effect** • Lethal traps: **No effect** • Shooting: (noise) **May affect** • Lethal chemicals: **No effect** • Nest/ egg destruction: **No effect**	• **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.	• Technical assistance: **No effect** *(i.e. recommendation of legal hunting, physical exclusion, habitat modificatio*n) • Paintball guns: **No effect** • Bird barriers: **No effect** • Audio scaring: **No effect** • Visual scaring: **No effect** • Lasers: **No effect** • Chemical repellents: **No effect** • Live traps: **No effect** • Live capture and euthanasia: **No effect** • Lethal traps: **No effect** • Shooting: **No effect** • Lethal chemicals: **No effect** • Nest/ egg destruction: **No effect**	• **No effect**

Species	Counties	Habitat Characteristics	Relevant Information	Methods for Resolving Bird Damage, and Their Effects	Overall Determination
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.	• Technical assistance: **No effect** *(i.e. recommendation of legal hunting, physical exclusion, habitat modificatio*n) • Paintball guns: **No effect** • Bird barriers: **No effect** • Audio scaring: **No effect** • Visual scaring: **No effect** • Lasers: **No effect** • Chemical repellents: **No effect** • Live traps: **No effect** • Live capture and euthanasia: **No effect** • Lethal traps: **No effect** • Shooting: **No effect** • Lethal chemicals: **No effect** • Nest/ egg destruction: **No effect**	• **No effect**

United States Department of the Interior

FISH AND WILDLIFE SERVICE
3817 Luker Road
Cortland, New York 13045

March 25, 2019

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 March 4, 2019, letter regarding the U.S. Department of Agriculture, Animal and Plant Health Inspection Service, Wildlife Services (APHIS) management of birds 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 and our Long Island suboffice 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 rationales can be found in the table from your March 2019 letter. The APHIS has determined that the Program will result in no effects to the following species under Service jurisdiction:

- American hart's tongue fern (*Asplenuim scolopendrium* var. *americana*) (T)
- Bog turtle (*Clemmys [=Glyptemys] muhlenbergii*) (T)
- Chittenango ovate amber snail (*Novisuccinea chittenangoensis*) (T[1])
- Clubshell (*Pleurobema clava*) (E)
- Dwarf wedgemussel (*Alasmidonta heterodon*) (E)
- Eastern massasauga rattlesnake (*Sistrurus catenatus catenatus*) (T)
- Leedy's roseroot (*Rhodiola integrifolia ssp. leedyi*) (T)
- Green sea turtle (*Chelonia mydas*) (T)
- Hawksbill turtle (*Eretmochelys imbricate*) (E)
- Houghton's goldenrod (*Solidago houghtonii*) (T)
- Karner blue butterfly (*Lycaeides melissa samuelis*) (E)
- Leatherback turtle (*Dermochelys coriacea*) (E)
- Northeastern bulrush (*Scirpus ancistrochaetus*) (E)

[1] T = threatened

- Northern wild monkshood (*Aconitum noveboracense*) (T)
- Rayed bean (*Villosa fabalis*) (E)
- Sandplain gerardia (*Agalinus acuta*) (E)
- Seabeach amaranth (*Amaranthus pumilus*) (T)
- Small whorled pogonia (*Isotria medeoloides*) (T)
- Eastern prairie fringed orchid (*Platanthera leucophaea*) (T) (historic)
- Rusty patched bumble bee (*Bombus affinis*) (E) (historic)
- Swamp pink (*Helonias bullata*) (T) (historic)

We have no further comments on these species.

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

- Indiana bat (*Myotis sodalis*) (E[2])
- Kemp's [Atlantic] ridley turtle (*Lepidochelys kempi*) (E)
- Northern long-eared bat (*Myotis septentrionalis*) (T)
- Piping plover (*Charadrius melodus*) (T/E) or critical habitat
- Red knot (*Calidris canutus rufa*) (T)
- Roseate tern (*Sterna dougallii*) (E)

Given the extremely low likelihood of Program activities occurring when and where these species are likely to be present, and the discountable likelihood of harming any individuals should they 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

[2] E = endangered

at 607-753-9334. Future correspondence with us on this Program should reference project file 19I0850.

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: USFWS, Long Island, NY
NYSDEC, Albany, NY (Wildlife Diversity)

APPENDIX D: STATE LISTED THREATENED AND ENDANGERED SPECIES CONSULTATION WITH NYSDEC

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*

Rufa Red Knot – *Calidris canutus rufa*

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*

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

April 30, 2019

Dear Director Gosser:

This letter is in response to your March 4, 2019 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 *Reducing Bird Damage in the State of New York.* With the exception outlined in the paragraph below, we concur that the actions outlined in the EA are not anticipated to have NO EFFECT on any state-listed threatened or endangered species.

The potential concern to state-listed species is when state-listed birds occur within the project area. In general, the actions proposed are not expected to affect listed species. However, when a state-listed bird such as Peregrine falcon or Northern harrier occurs at the project location, the proposed trapping and relocation of these animals will affect those individual animals that are captured. As described in the EA, the techniques employed should result in the avoidance of adverse effects, but since listed species are directly being handled, they will be affected. For this reason, for state-listed birds, we believe that this project MAY AFFECT, BUT IS UNLIKELY TO ADVERSELY AFFECT listed bird species. We also concur that the activities outlined in the EA will have no effect on the population of any state listed species.

Sincerely,

James Farquhar, Chief
Bureau of Wildlife

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

NEW YORK STATE OF OPPORTUNITY. | Parks, Recreation, and Historic Preservation

ANDREW M. CUOMO
Governor

ERIK KULLESEID
Commissioner

March 29, 2019

Mr. Allen Gosser
State Director - New York
USDA, APHIS, Wildlife Services
572 Third Avenue Extension, Suite 2
Rensselaer, NY 12144
(via email only)

Re: USDA
Reducing Bird Damage in the State of New York
19PR02137

Dear Mr. Gosser:

Thank you for requesting the comments of the State Historic Preservation Office (SHPO). We have reviewed the project in accordance with Section 106 of the National Historic Preservation Act of 1966. These comments are those of the SHPO and relate only to Historic/Cultural resources. They do not include potential environmental impacts to New York State Parkland that may be involved in or near your project. Such impacts must be considered as part of the environmental review of the project pursuant to the National Environmental Policy Act and/or the State Environmental Quality Review Act (New York Environmental Conservation Law Article 8).

Based upon this review, it is the opinion of the New York SHPO that no historic properties, including archaeological and/or historic resources, will be affected by this undertaking.

If I can be of any further assistance, please do not hesitate to contact me at (518) 268-2166 or john.bonafide@parks.ny.gov.

Sincerely,

John A. Bonafide
Director,
Technical Preservation Services Bureau
Agency Historic Preservation Officer

Division for Historic Preservation
P.O. Box 189, Waterford, New York 12188-0189 • (518) 237-8643 • www.nysparks.com

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

June 10, 2019

Allen Gosser
USDA APHIS
572 3rd Avenue Ext, Suite 2
Rensselaer, New York 12411

Re: **F-2019-0371 (DA)**
U.S. Department of Agriculture (USDA) –
Animal and Plant Health Inspection Service (APHIS),
Wildlife Services (WS)
USDA Direct Action –
Reducing Bird Damage in the State of New York (2019)
State of New York - Statewide
Concurrence with Consistency Determination

Dear Mr. Gosser:

The Department of State has completed its review of the USDA consistency determination regarding the proposed actions. Based upon the information submitted, the Department of State concurs with the Corps' consistency determination regarding this matter.

Please feel free to contact us at (518) 474-6000 or e-mail to: CR@dos.ny.gov and reference file no. F-2019-0371 (DA).

Sincerely,

Gregory L. Capobianco
Office of Planning, Development and
Community Infrastructure

GLC/ TS

NEW YORK STATE OF OPPORTUNITY. Department of State