ENVIRONMENTAL ASSESSMENT

WILDLIFE HAZARD REDUCTION:
JOHN F. KENNEDY INTERNATIONAL AIRPORT

Prepared by:

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

In cooperation with:

United States Fish and Wildlife Service

National Park Service

New York State Department of Environmental Conservation

New York City Department of Environmental Protection

The Port Authority of New York and New Jersey

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EXECUTIVE SUMMARY

Bird strikes (bird collisions with aircraft) are a hazard to human health and safety and can cause major financial losses due to aircraft destruction, equipment damage, runway closures, personnel costs, and passenger accommodations. U.S. Department of Transportation, Federal Aviation Administration (FAA) regulations (14 CFR 139.337) require airports to assess wildlife hazards and, as needed, to develop and implement wildlife hazard management plans. At John F. Kennedy International Airport (JFK), two strikes are particularly noteworthy. The first occurred in 1975, when herring and great black-backed gulls were ingested into an engine of a departing DC-10. The engine exploded and separated from the aircraft and the takeoff was aborted; the aircraft caught fire and was destroyed. Fortunately, no fatalities occurred. The second occurred in 1995 when an Air France Concorde ingested a pair of Canada geese into an engine. The aircraft was able to land safely but sustained major damage. The French Aviation Authority sued the Port Authority of New York and New Jersey (PANYNJ) and the case was eventually settled out of court for over $5 million.

A Final Environmental Impact Statement (FEIS) on gull hazard management at JFK was completed in 1994 (USDA 1994). The USDA APHIS Wildlife Services (WS), in cooperation with the Department of the Interior's Fish and Wildlife Service and National Park Service, the Federal Aviation Administration, the New York State Department of Environmental Conservation, the Port Authority of New York and New Jersey, and the New York City Department of Environmental Protection, completed a supplement to the EIS in 2012 to address management of all bird hazards at JFK (USDA 2012). The management alternative selected in the WS Record of Decision enables the use and recommendation of a wide range of bird hazard reduction techniques, including nonlethal and lethal methods, through an Integrated Wildlife Damage Management (IWDM) approach.

The scope of service requested by JFK and the affected environment have changed substantially since the initial 1994 FEIS. Previously unknown variables pertaining to gull populations are now documented, wildlife management strategies have evolved, and management methods are available today that did not exist twenty years ago. For these reasons, WS has deemed appropriate to re-evaluate the need for an EIS by submitting an updated EA.

The preferred alternative considered in the EA would be to continue and expand the current IWDM approach. The IWDM strategy encompasses the use of practical and effective methods of preventing or reducing damage while minimizing harmful effects of damage management measures on humans, target and nontarget species, and the environment. Under this action, WS could provide technical assistance and direct operational assistance including nonlethal and lethal management methods, as described in the WS Decision Model (Slate et al. 1992). When appropriate, nonlethal methods like physical exclusion, altering cultural practices, habitat modification, repellents or harassment would be recommended and utilized to reduce damage. In other situations, lethal methods including the use of shooting, toxicants, nest/egg removal, live capture and euthanasia would be recommended and used by WS. In determining the damage management strategy, preference would be given to practical and effective nonlethal methods. However, nonlethal methods may not always be applied as a first response to each damage problem. The most appropriate response could often be a combination of nonlethal and lethal methods. Other alternatives examined in the EA include an alternative in which WS is restricted to the use and recommendation of only nonlethal wildlife damage management methods, and an alternative in which WS does not become involved in wildlife damage management (Chapter 2). 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 impacts of each alternative on target bird populations, nontarget species including state and federally listed threatened and endangered species, human health and safety, and aesthetics.

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ACRONYMS

APHIS	Animal and Plant Health Inspection Service
BBS	Breeding Bird Survey
CBC	Christmas Bird Count
CEQ	Council on Environmental Quality
CSA	Cooperative Service Agreement
CWA	Clean Water Act
DSNY	New York City Department of Sanitation
EA	Environmental Assessment
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FDA	Food and Drug Administration
FEIS	Final Environmental Impact Statement
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FONSI	Finding of No Significant Impact
FY	Federal Fiscal Year
IPaC	Information for Planning and Consultation
IWDM	Integrated Wildlife Damage Management
JFK	John F. Kennedy International Airport
JFKWMU	JFK Wildlife Management Unit
MBTA	Migratory Bird Treaty Act
MOU	Memorandum of Understanding
NAS	National Audubon Society
NEPA	National Environmental Policy Act
NPS	National Park Service
NWRC	National Wildlife Research Center
NYC	New York City
NYCDEP	New York City Department of Environmental Protection
NYSDAM	New York State Department of Agriculture and Markets
NYSDEC	New York State Department of Environmental Conservation, Bureau of Wildlife
NYSDOH	New York State Department of Health
OPRHP	New York State Office of Parks, Recreation and Historic Preservation
PANYNJ	Port Authority of New York and New Jersey
SEIS	Supplemental Environmental Impact Statement
SOP	Standard Operating Procedures
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USDOT	U.S. Department of Transportation
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 changing 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 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 wildlife damage management at John F. Kennedy International Airport (JFK). 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 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 Department of the Interior Fish and Wildlife Service (USFWS) and the Federal Aviation Administration (FAA) 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. Program activities are not based on punishing offending animals but are conducted to reduce damage and risks to human and livestock health and safety, and are used as part of the WS Decision Model (Slate et al. 1992).

Wildlife hazards are a concern to civil and military airports around the world, including at John F. Kennedy International Airport (JFK; Dolbeer et al. 2011). Wildlife strikes kill animals, damage aircraft, and pose a significant risk to human safety. Two strikes at JFK are particularly noteworthy: a 1975 gull

[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.

strike and a 1995 Canada goose strike. During the 1975 strike, herring and great black-backed gulls were ingested into an engine of a departing DC-10. The engine exploded and separated from the aircraft and the takeoff was aborted; the aircraft caught fire and was destroyed. Fortunately, no fatalities occurred. The accident was settled out of court in 1985 for over $15 million between at least three defendants, however the amounts paid by each party is unknown. In the 1995 goose strike, an Air France Concorde ingested a pair of Canada geese into an engine. The aircraft was able to land safely but sustained major damage. The French Aviation Authority sued the Port Authority of New York and New Jersey (PANYNJ) and the case was eventually settled out of court for over $5 million. More recently, on January 15, 2009, U.S. Airways Flight 1549 ingested four Canada geese in both the left and right engines while departing nearby LaGuardia airport and lost all power. The plane made an emergency landing in the Hudson River. No lives were lost, however, the aircraft was a $60 million loss and the incident served to raise public awareness regarding the risks of large birds such as geese within aircraft departure and arrival paths (NTSB 2010).

In 1994, WS completed a Final Environmental Impact Statement (1994 FEIS) which reviewed the environmental impacts of alternatives for managing gull hazards to aircraft at JFK. The 1994 FEIS focused on the management of herring, great black-backed, laughing, and ring-billed gulls which were involved in the majority of wildlife strikes at JFK. The location of JFK within a major bird migratory corridor (Atlantic Flyway), adjacent to Gateway National Recreation Area (Gateway NRA), Jamaica Bay Wildlife Refuge, and the presence of a large colonial nesting laughing gull colony at the end of two runways (within the wildlife refuge) presented JFK with unique bird-aircraft collision hazards. The JFK wildlife strike management program subsequent to the completion of the 1994 FEIS substantially reduced wildlife strikes at JFK. However, there were substantial unknown variables relating to the laughing gull colony that warranted an EIS.

At the time the 1994 FEIS was prepared, the JFK Wildlife Management Unit (JFKWMU) also worked to address risks to aircraft associated with other bird species, but risks caused by species other than gulls were relatively low and were not addressed in detail in the 1994 FEIS. However, as land uses and bird populations changed since the completion of the 1994 FEIS, the wildlife hazards at JFK were altered as well. These changes resulted in the need to review wildlife hazards associated with species other than gulls. A supplement (SEIS) to the 1994 FEIS was prepared, in part, to address the revised scope (USDA 2012).

Currently, the scope of service requested by JFK and the effected environment have changed substantially since the initial 1994 FEIS. Gulls still pose a threat to human health and safety and property damage at JFK, but are not nearly as abundant compared to when the 1994 FEIS was adopted. For example, from fiscal year 1991-1995 the average removal of the four main gull species (great black-backed gull, herring gull, laughing gull, and ring-billed gull) at JFK was 9,286/year. In contrast, the average removal of these four gull species from fiscal year 2013-2017 was 2,188/year. The decrease in removal is likely due to a combination of factors including the persistent bird strike management program implemented around JFK since the 1990s. Additionally, land use and bird species composition in this area have changed which has led to a different level of wildlife management around JFK. Furthermore, previously unknown variables pertaining to gull populations are now documented, wildlife management strategies have evolved, and management methods are available today that did not exist twenty years ago. The laughing gull colony has been monitored for two decades showing a healthy response to JFK's management program. For these reasons, WS has deemed appropriate to re-evaluate the need for an EIS by submitting this updated EA.

This EA will facilitate planning, interagency coordination and the streamlining of program management, and will 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. Pursuant to the National Environmental Policy Act (NEPA) and the Council on Environmental Quality (CEQ) regulations, WS is preparing this EA to document the analyses associated with proposed federal actions and to inform decision-makers and the public of reasonable alternatives capable of avoiding or minimizing significant effects. This EA will also serve as a decision-aiding mechanism to ensure that the policies and goals of the NEPA are infused into the actions of the agency[2].

The current wildlife management staff at JFK mainly consists of a Port Authority Wildlife Biologist and a USDA Wildlife Biologist. The Port Authority Biologist directs the wildlife management program and administers the wildlife management contacts at the airport. In other words, the Port Authority Biologist is responsible for implementing all wildlife policies and programs at the airport. The USDA Wildlife Biologist is responsible for conducting wildlife management activities and consulting with the Port Authority Biologist on wildlife management on and off the airport. This includes, but is not limited to, conducting surveys, observing and analyzing wildlife population trends, observing and reporting hazardous wildlife attractants on and off the airport, conducting wildlife control on and off the airport, and recommending new technologies or best-management practices to improve the effectiveness of JFK's wildlife management strategies.

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 at JFK associated with American black duck (*Anas rubripes*), American coot (*Fulica americana*), American golden plover (*Pluvialis dominica*), American goldfinch (*Spinus tristis*), 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*), Canada goose (*Branta canadensis*), 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 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*

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

argentatus), hooded merganser (*Lophodytes cucullatus*), horned grebe (*Podiceps auritus*), horned lark (*Eremophila alpestris*), house sparrow (*Passer domesticus*), 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 sparrows (*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 sparrows (*Melospiza melodia*), spotted sandpiper (*Actitis macularius*), 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*).

Wildlife damage management has yielded successful results since its implementation at JFK. Over the last 40 years, strike rates from large birds (>1 pound) has decreased. Although small birds can still cause significant damage to aircraft, large birds have a greater probability of causing serious damage.

1.2 NEED FOR ACTION

Some species of wildlife have adapted to and 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-NY to manage damage and threats to property and threats to humans associated with bird species in or around JFK International Airport.

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 (e.g., reproduce, walk, forage) habitats 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 losses associated with wildlife is actual damage requiring assistance (i.e., has reached an individual threshold). The term "damage" is most often defined as economic losses to resources or threats to human safety, 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 and Lindsey 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, 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 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, particularly in and around airports.

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. Indeed the greatest threat to damage around JFK is the potential for unacceptable safety hazards (e.g., aircraft striking birds). Those problems frequently occur on airport property; however suitable usable space for the birds such as nearby private properties, natural/habitat restoration sites, wildlife refuges, corporate and industrial sites, residential communities, apartment/condominium complexes, municipal parks, schools, hospitals, office complexes, roadways, and other areas increase the threat of potential damage in and around airports.

The need for action to manage damage and threats associated with birds arises from requests for assistance[3] received by WS and the USFWS to reduce and prevent damage associated with birds from occurring. WS has identified those bird species most likely to be responsible for causing damage at JFK based on previous requests for assistance and assessments of the threat of wildlife hazards at airports. Table 1.1 lists the number of individuals per species managed under direct control projects that involve bird damage or threats associated with JFK from the federal fiscal year[4] (FY) 2013 through FY 2017. Direct control includes damage management activities that are directly conducted by or supervised by personnel of WS. Technical assistance was also provided by WS to JFK personnel in order to prevent and 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. WS' technical assistance and direct control activities will be discussed further in Chapter 2 of this EA.

The agreement between WS and PANYNJ to assist with bird damage management at JFK is related to threats to human health and safety and threats to property. Wildlife strikes can cause substantial damage to aircrafts, which could require costly repairs. In some cases, wildlife 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 (especially fall migration) and during winter months when food sources are limited. For some bird species, large 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 The number of managed bird species by WS-NY that pose a threat to property and human health and safety at JFK from FY 13 thru FY 17. This table includes species that were dispersed (83%), translocated (0.2%), or depredated (16.8%)[†].

Species	2013	2014	2015	2016	2017	Average
American black duck	74	19	18	37	16	**32.8**
American crow	15	100	11	11	23	**32**
American kestrel	32	22	12	73	204	**68.6**
American oystercatcher	40	15	4	10	39	**21.6**
American robin	-	-	10	50	23	**16.6**
American wigeon	7	-	-	-	-	**1.4**
American woodcock	2	-	3	-	-	**1**
Bald eagle	-	-	-	-	3	**0.6**
Barn swallow	102	440	152	-	46	**148**
Belted kingfisher	-	-	-	1	-	**0.2**
Black skimmer	1	-	-	-	-	**0.2**
Black-bellied plover	4	-	49	5	22	**16**
Black-crowned night-heron	1	-	-	-	1	**0.4**
Blue-winged teal	-	2	-	-	-	**0.4**
Boat-tailed grackle	15	3	7	2	5	**6.4**
Bonaparte's gull	-	-	-	1	-	**0.2**

[3]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.

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

Brant	3,082	1,187	1,209	593	2,434	**1701**
Brown-headed cowbird	2,000	1,285	5,000	3,742	10,895	**4,584.4**
Canada goose	700	70	406	216	419	**353.4**
Cattle egret	2	1	-	-	-	**0.6**
Common grackle	2	25	96	3	21	**28.2**
Common nighthawk	-	-	-	-	1	**0.2**
Common tern	8	32	40	-	250	**66**
Cooper's hawk	1	4	-	26	23	**10.8**
Double-crested cormorant	433	135	261	265	532	**325.2**
Eastern meadowlark	3	-	-	3	-	**1.2**
European starling*	4,359	14,633	10,740	19,733	25,727	**15,038.4**
Fish crow	179	14	202	10	35	**88**
Gadwall	4	6	-	-	-	**2**
Glossy ibis	6	358	-	22	1,186	**314.4**
Gray catbird	-	-	1	-	-	**0.2**
Great black-backed gull	110	96	133	70	186	**119**
Great blue heron	3	4	5	2	6	**4**
Great egret	4	14	6	-	18	**8.4**
Green heron	-	-	-	-	2	**0.4**
Gull-billed tern	-	-	4		-	**1**
Gyrfalcon	-	-	-	2	-	**0.4**
Herring gull	916	1,216	1,558	1,456	1,630	**1,355.2**
Horned lark	-	71	-	36	17	**24.8**
House sparrow*	30	-	47	27	84	**37.6**
Killdeer	53	7	53	10	172	**59**
Lark bunting	8	-	-	-	-	**1.6**
Laughing gull	2,646	1,568	3,303	3,622	2,151	**2,658**
Mallard	102	234	48	75	75	**106.8**
Merlin	-	-	-	5	3	**1.6**
Monk parakeet*	9	3	-	-	3	**3**
Mourning dove	1,823	498	1,423	2,616	4,315	**2,135**
Mute swan*	20	16	6	11	4	**11.4**
Northern goshawk	-	-	1	-	-	**0.2**
Northern harrier	4	7	3	39	18	**14.2**
Northern mockingbird	-	2	-	-	-	**0.4**
Osprey	141	224	160	192	270	**197.4**
Peregrine falcon	17	32	22	51	41	**32.6**
Pied-billed grebe	-	-	-	1	-	**0.2**
Red-tailed hawk	64	95	58	58	100	**75**
Red-winged blackbird	279	385	157	64	260	**229**
Ring-billed gull	230	748	386	141	258	**352.6**
Ring-necked pheasant*	1	-	1	-	-	**0.4**
Rock pigeon*	208	837	420	242	156	**372.6**
Sanderling	80	-	-	-	-	**16**
Semipalmated plover	257	-	-	66	594	**183.4**
Semipalmated sandpiper	-	-	-	-	5	**1**
Sharp-shinned hawk	-	1	-	4	-	**1**
Snow bunting	50	25	76	105	80	**67.2**
Snow goose	2	-	60	-	-	**12.4**
Snowy egret	3	16	16	1	1	**7.4**
Snowy owl	4	4	5	2	5	**3.6**
Song sparrow	-	10	-	1	-	**2.2**
Tree swallow	1,000	105	-	-	-	**221**

Turkey vulture	2	-	-	-	-	**0.4**
Whimbrel	-	1	-	-	-	**0.2**
Willet	14	6	4	43	94	**32.2**
Wood duck	1	-	-	-	-	**0.2**
Yellow-rumped warbler	-	-	30	-	-	**6**
Total	**19,153**	**24,576**	**26,206**	**33,745**	**52,453**	

† Data provided by PANYNJ.

* Represents an introduced or invasive species.

This EA reviews wildlife hazard management activities which may be conducted on and off JFK property including actions proposed for Gateway NRA. The U.S. Department of Transportation (USDOT), Federal Aviation Administration (FAA) has issued Advisory Circular 150/5200-33C which directs airports to consider hazardous wildlife on or near airports and adjacent land uses that cause movements of hazardous wildlife onto, into, or across an airport's approach or departure airspace or aircraft operations area. As per the guidance in the FAA Advisory Circular, this EA considers wildlife hazards to aircraft which have been identified within a 7-mile radius around JFK including hazards which have been identified at Gateway NRA.

Available data on movements of resident Canada geese indicate that management of hazards associated with this species within the 5-mile radius of JFK may require work outside the 5-mile radius. Resident Canada geese are the species of greatest concern relative to off-airport hazards to aircraft. Studies of goose movement patterns in response to harassment in Orange County indicated that although harassment was effective in decreasing bird numbers at treatment sites, there were corresponding increases in geese at unmanaged areas within 1.9 miles of the treatment area (Preusser et al. 2008). In addition, Rutledge et al. (2015) satellite-tagged and tracked 16 geese around Greenboro, NC. They found that these resident Canada geese moved 1-3 miles on a daily basis and suggested that resident Canada geese be removed within a minimum area of five miles of suburban airports. Lastly, a two year study conducted in New York City (NYC) monitored movements of Canada geese banded within approximately five miles of JFK (Seamans et al. 2009). During the study, researchers monitored the area in a 7.2 mile radius around JFK for banded birds. At the conclusion of the study, approximately 45% of the birds remained within approximately five miles of JFK. Geese were observed within three miles of their banding location 95% of the time. Geese which remained within the study area were resighted at an average straight-line distance of the original banding site of 2.2 miles. Therefore, birds that spend time within the 4-5 mile radius of JFK may also be using sites within the 5-7 mile radius of the airport. Based on this information, we are proposing to assess resident Canada goose hazard management activities within a seven mile radius around JFK. This decision is consistent with the International Bird Strike Committee Best Practice Standards for wildlife hazard control at airports Standard 9 which recommends airports reduce wildlife attractants and associated wildlife hazards within a 13 km (7.8 mile) circle around the airport (IBC 2006).

Other Wildlife Concerns at JFK International Airport

The grounds of JFK provide habitat for a variety of mammals, reptiles and amphibians including eastern cottontail rabbits, black-tailed jackrabbits, feral cats, small rodents (Norway rats, house mice, meadow voles and white-footed mice; Barras et al. 2000), eastern diamondback terrapins, snakes, frogs and toads. Most of these species are rarely if ever struck by aircraft and in no instance has a strike by any of these species resulted in an air-carrier report of damage to an aircraft, so none of these species is considered to pose much of a direct hazard to aircraft. Although these species do not pose a direct hazard to aircraft, smaller species such as rodents (rats, mice, voles), cottontail rabbits, and black-tailed jackrabbits are a food source for medium to large size raptors such as snowy owls, red-tailed hawks, and rough-legged hawks which pose a much greater risk to aircraft and have been struck by aircraft at JFK. Carcasses of animals struck at the airfield may also be an attractant to scavengers. However, risks from carcasses are likely already minimized by JFKWMU efforts to quickly remove all animal carcasses. JFK did not start

counting wildlife strikes with non-avian species until 2000. Eastern cottontail and eastern diamondback terrapins are the species most commonly reported as struck. Eastern diamondback terrapins are attracted to the sand/gravel in safety areas for Runway 4L (Kilo Extension) for nesting, which explains why there are so many struck at JFK. Barriers are put into place to help prevent many turtles from entering the runway, however, WS does aid the PANYNJ in data collection for turtles that do enter the airport operations area and will move them to a safer location.

This EA will focus specifically on bird related damage or threats of damage at JFK. All mammals that are managed on JFK property are analyzed under the statewide mammal EA titled: *Mammal Damage Management in the State of New York* (USDA 2018) and are not examined in this EA.

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

Several bird species listed in Table 1.1 can be closely associated with human habitation and often exhibit gregarious roosting behavior, such as waterfowl, crows, starlings, and pigeons. The close association of those bird species with human activity can pose threats to airport property and human health and safety by potentially damaging the aircraft itself and threatening the safety of air passengers if birds are struck. Additionally, excessive droppings can be aesthetically displeasing and increase the risk of disease transmission. Also, aggressive behavior, primarily from waterfowl, can pose risks to human safety. Wildlife strikes have attributed to $310,357 of monetary damage according to the FAA database at JFK from FY 2013 to FY 2017, which is an average of $62,071.40 per year. However, it is difficult to place a monetary value on human lives and their safety.

Threat of Wildlife Hazards at John F. Kennedy International Airport

Birds can 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 wildlife 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, and are unable to maneuver due to the low altitude. During an 18 year period, approximately 60% of reported wildlife strikes in the 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 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).

From October 1, 2012 through April 29, 2018 (the most current information available) 3,103 bird-specific strikes were reported by airports in New York State (FAA 2018). There were 1,091 reported bird-specific strikes at JFK alone, which represents 35.2% of the total bird-specific strikes across the state. Of the identifiable bird species, the most common strikes at JFK were associated with barn swallows (62), herring gulls (52), and horned larks (50). The number of actual bird-specific 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).

Injuries can occur from wildlife 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 Nov 27, 2017, an aircraft struck at least 3 snow geese on approach to JFK, 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. Cost estimates have still not been determined (L. Francoeur, PANYNJ, personal communication, 2018).

Birds struck by aircraft can cause substantial property damage. Wildlife strikes can cause catastrophic failure of aircraft systems (e.g., ingesting birds into engines), which can cause the plane to become uncontrollable and lead to crashes. Table 1.1 shows some of the bird species addressed in this assessment that are known to cause damage or to potentially cause damage to property at JFK. The following are several recent examples of damaging airstrikes that occurred at JFK. On May 7, 2017, an aircraft struck multiple herring gulls while departing JFK. There was no engine failure as a result to the strike, however, damage costs to the aircraft were approximately $14,000. On October 20, 2016, a herring gull was struck on approach to JFK. Eight fan blades were replaced and the estimated cost of repairs was $36,000. On June 11, 2016, an unknown medium-sized bird was struck during take-off, damaging 37 fan blades. The cost of repairs in this instance was approximately $90,000. Lastly, on January 4, 2016, a bald eagle was struck on approach to JFK which left minor damage to the fuselage. This caused the aircraft to be out of service for a period of time.

Some bird species pose a greater risk to damage aircraft than others and therefore increase the threat to human health and safety. 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% involving raptors, 21% of gull strikes, 7% associated with pigeons and doves, and 2% involving shorebirds (Dolbeer et al. 2015). Since 1990, aircraft strikes involving birds in the United States have resulted in $631.8 million in reported damages to aircraft and $76.4 million in other monetary losses, including lost revenue, cost of putting passengers in hotels, re-scheduling flights, and flight cancellations (Dolbeer et al 2015). From 2000 through 2015, >$4.4 million in damage to aircraft has been reported as a result of wildlife strikes in New York (FAA 2018).

From 2000-2017, the identifiable species responsible for causing damage most often at JFK are herring gulls, Canada geese, and double-crested cormorants. These species share commonalities in that they are of greater mass and can cause damage to aircraft more easily, are found near large bodies of water, and are often gregarious in nature. The characteristics that they share increase their threat to damage aircraft at JFK specifically because of where the airport is located. Of these three species, Canada geese caused damage in 13.6% of their strikes, double-crested cormorants caused damage in 8.7% of their strikes, and herring gulls caused damage in 2.5% of their strikes at JFK.

Bird damage to property at JFK also occurs through direct damage to structures through roosting behavior and through their nesting activities. Direct damage to property can occur when there are accumulations of fecal droppings at airport buildings from roosting or nesting passerines. The following are examples of direct damage to infrastructure specifically at JFK. There has been damage to the hangar where 9/11 artifacts are stored from rock pigeon and European starling droppings. The droppings were eating through the metal and paint of the artifacts and had to be cleaned for aesthetic purposes as 9/11 families were frequently touring the hangar. JFK has also experienced malfunctions in light poles and navaids due to ospreys nesting on top of them, which can also pose as a fire hazard.

There has been an increasing trend in the strike rate (number of reported wildlife strikes per 100,000 aircraft movements at JFK since 1995, ranging from 21.7 in 1995 to 54.2 in 2010. The strike rate at JFK for 2017 was 44.2, which is still higher than the 2015 (most recent data available) national average of approximately 34 for commercial and general aviation (FAA 2016). There is a chance that some of the increase in strike rate is due to better reporting in recent years, however, it is unlikely that reporting explains the increase completely. FAA Advisory Circular 150/5200-32B considers it a bird strike when (1) a strike between a bird and aircraft has been witnessed, (2) evidence or damage from a strike has been

identified on an aircraft, (3) bird remains are found within 250 feet of a runway centerline, within 1,000 feet of a runway end, or anywhere on the airport property, and (4) the presence of birds on or off the airport had a negative effect on a flight.

1.3 NATIONAL ENVIRONMENTAL POLICY ACT AND WS DECISION-MAKING

All federal actions are subject to the National Environmental Policy Act (Public Law 9-190, 42 USC 4321 et seq.), including the actions of WS. The WS program follows the Council on Environmental Quality 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. 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 at JFK 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 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 New York State Department of Environmental Conservation (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 wildlife species addressed in this environmental assessment. The National Park Service regulates management of wildlife on NPS lands.

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 at JFK 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 at JFK International Airport?
- Do the alternatives have significant cumulative impacts meriting an Environmental Impact Statement?

1.5 AFFECTED ENVIRONMENT/SCOPE OF ANALYSIS

Bird damage management at JFK would be routinely conducted by WS on airport property pursuant to USDOT/FAA Advisory Circular 150/5200-33C and within a 7-mile radius around JFK during Canada goose management projects. WS-NY has a signed Cooperative Service Agreement (CSA) with PANYNJ that retains operational, advisory, and research assistance at several airports in the NY/NJ metropolitan area, including JFK.

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 or around JFK when a request is received for such services by the appropriate resource owner or manager. In those cases where a federal agency requests WS' assistance with managing damage caused by birds or WS requests authorization for actions to manage wildlife on federal land to reduce risks to human health and safety related to aviation wildlife strikes, the requesting and/or authorizing federal agency would be responsible for analyzing those activities in accordance with the NEPA. However, this EA would cover such actions if the requesting and/or approving federal agency determined the analyses and scope of this EA were appropriate for those actions and the requesting and/or approving federal agency adopted this EA through their own decision based on the analyses in this EA. Therefore, actions that are anticipated to be requested and/or approved on federal lands have been analyzed in the scope of this EA.

Site Specificity

This EA analyzes the potential impacts of bird damage management based on previous activities conducted in and around JFK where WS and the appropriate entities have entered into a MOU, CSA, or other comparable document. The EA also addresses the potential impacts of bird damage management on areas where additional agreements may be signed in the future. Because the need for action is to reduce damage and because the program's goals and directives are to provide services when requested, within the constraints of available funding and workforce, it is conceivable that additional bird damage management efforts could occur. Thus, this EA anticipates the potential expansion and analyzes the impacts of such efforts as part of the alternatives.

Most of the bird species addressed in this EA can be found in or around JFK throughout the year; therefore, damage or threats of damage can occur during any point of the year. This EA emphasizes major issues as those issues relate to JFK and the surrounding area specifically.

Chapter 2 of this EA identifies and discusses issues relating to bird damage management at JFK. The standard WS Decision Model (Slate et al. 1992) would be the site-specific procedure for individual actions conducted by WS in the state (see Chapter 2 for a description of the Decision Model and its application). Decisions made using the model would be in accordance with WS' Directives and Standard Operating Procedures (SOPs) described in this EA as well as relevant laws and regulations.

The analyses in this EA are intended to apply to any action that may occur within a 7-mile radius of JFK. 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 AGENCIES INVOLVED IN THIS ENVIRONMENTAL ASSESSMENT AND THEIR ROLES AND AUTHORITIES

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.

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.

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. The EPA is also responsible for administering and enforcing Section 404 of the Clean Water Act (CWA) along with the U.S. Army Corps of Engineers.

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.

The NPS has broad authority to manage wildlife and other natural resources within the boundaries of units of the national park system. All natural and cultural resources with GATE, including wildlife, are managed by the NPS in accordance with the laws, policies, and regulations that pertain to the National Park System. The most important statutory directives for the National Park Service are provided by the interrelated provisions of the NPS Organic Act of 1916 and the NPS General Authorities Act of 1970, as amended. The Service's 2006 Management Policies and regulations found within Title 36 of the Code of Federal Regulations (C.F.R.) interpret the Organic Act and provide a regulatory framework for the management of park resources, including wildlife. The NPS's ability to manage wildlife resources has been repeatedly upheld by the federal courts.

Federal Aviation Administration (FAA)

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

United States Army Corps of Engineers (USACE):

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

United States Food and Drug Administration (FDA)

The FDA is responsible for protecting the public health by assuring the safety, efficacy, and security of human and veterinary drugs, biological products, medical devices, our nation's food supply, cosmetics, and products that emit radiation. The FDA is also responsible for advancing the public health by helping to speed innovations that make medicines and foods more effective, safer, and more affordable; and helping the public get the accurate, science-based information they need to use medicines and foods to improve their health. 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 250 facilities including state parks, historic sites, boat launches, parkways and trails within New York. Their mission is to "provide safe and enjoyable recreational and interpretive opportunities for all New York State residents and visitors, and to be responsible stewards of valuable natural, historic, and cultural resources" (OPRHP 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 Health (NYSDOH)

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

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, DEP oversees one of the largest capital construction programs in the region. The source of NYC's drinking water comes from a network of 19 reservoirs and 3 controlled lakes in a 1,972 square-mile watershed. As the agency responsible for NYC's environment, DEP also regulates air quality, hazardous waste, and critical quality of life issues, including noise.

The NYCDEP, along with the PANYNJ, is also responsible for the initiation of the program to reduce resident Canada goose population in portions of NYC and associated strike hazards to aircraft using airports in the NYC area. The program was developed in response to the January 15, emergency landing of Flight 1549 in the Hudson River after a strike involving multiple Canada geese and a subsequent evaluation of recent Canada goose strikes in the NYC area.

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".

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.

1.7 RELATIONSHIP OF THIS EA TO OTHER ENVIRONMENTAL DOCUMENTS

Environmental Impact Statement - Proposal to Permit Take as provided under the Bald and Golden Eagle Protection Act: 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).

Environmental Impact Statement - 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 updates and expands 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, reviews six alternatives for reducing bird strikes, and evaluates environmental consequences of each alternative. Actions to address risks from resident Canada geese have been proposed for a seven-mile radius around JFK. Since activities conducted under the EIS will be re-evaluated under this EA to address the updated need for action and the associated affected environment, the EIS Record of Decision will be superseded by this analysis and the outcome of the Decision issued, based on the analyses in this EA.

WS' Environmental Assessments: WS-NY has previously developed an EA that analyzed the need for action to manage damage associated with pigeons, starlings, house sparrows, blackbirds, and crows (USDA 2005a), 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). Additionally, WS-NY developed a statewide EA that analyzed the need for action to manage damage associated with Canada geese (USDA 2017) and a statewide EA that analyzes the need for action to manage damage related to mammals (USDA 2018). These EAs identified the issues and analyzed alternative approaches to meet the specific needs identified in these documents.

The development of a statewide bird (excluding Canada geese) EA is currently being undertaken. Management activities that involve birds other than Canada geese are being re-evaluated under the new EA to address the current need for action and the associated affected environment. The previous EAs that addressed birds will be superseded by this new analysis and the outcome of the Decision issued.

Impacts to the human environment from all of these documents will be considered in the cumulative impacts analysis so as to perform a comprehensive evaluation of local and regional bird populations and other relevant issues.

New York State Department of Environmental Conservation Management Plans: The Atlantic Flyway Council developed the *Atlantic Flyway Resident Population Canada Goose Management Plan* (Atlantic Flyway Council 2011) that describes the status and values of these geese as well as outlines the consensus among wildlife agencies in regards to management strategies and goals across the Atlantic flyway. This report estimates the resident Canada goose population to be about 240,000 in New York State. However, NYSDEC biologists have determined that a resident Canada goose population of 85,000 is a more acceptable number for the state.

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 a Non-Native 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 focuses on education and outreach, the second focuses on responsible possession and care of mute swans, and the third involves the management of feral mute swans across the state (NYSDEC 2019a).

1.8 SUMMARY OF PUBLIC INVOLVEMENT

Issues and alternatives related to bird damage management as conducted by WS-NY were initially developed by WS in consultation with agency partners during the development of the FEIS and its

supplement. Issues were defined and preliminary alternatives were identified through the scoping process. The issues have now been refined by WS and agency partners to reflect the current scope surrounding JFK. As part of this process, and as required by the Council on Environmental Quality and APHIS' NEPA implementing regulations, this document will be provided 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

WS has the discretion to determine the geographic scope of their analyses under the NEPA. WS is currently operating under the analyses from the 1994 FEIS and the 2012 Supplement. Given the magnitude of changes to the environment and wildlife management practices described under the Introduction and Need for Action sections, WS feels that it is pertinent to refine the scope for this project and evaluate updated issues and methodologies in an EA. The intent in developing this EA is to determine if the proposed action would potentially have significant individual and/or cumulative impacts on the quality of the human environment that would warrant the preparation of an EIS or a FONSI.

Furthermore, CEQ advises that an EIS is necessary when there are unique or unknown risks. WS has been operating and collecting data at JFK airport for almost three decades, essentially eliminating all unique and unknown risks.

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. In addition, WS will comply with all local laws and ordinances when assistance is requested.

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.

[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.

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, 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 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 agencies 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 National Historic Preservation Act (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.

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.

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 Federal Insecticide, Fungicide, and Rodenticide Act (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.

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.

Animal Medicinal Drug Use Clarification Act of 1994

The Animal Medicinal Drug Use Clarification Act and its implementing regulations (21 CFR 530) establish several requirements for the use of animal drugs, including those used to capture and handle wildlife in damage management programs. Those requirements are: (1) a valid "*veterinarian-client-patient*" relationship, (2) well defined record keeping, (3) a withdrawal period for animals that have been administered drugs, and (4) identification of animals. A veterinarian, either on staff or on an advisory basis, would be involved in the oversight of the use of animal capture and handling drugs under any alternative where WS could use those immobilizing and euthanasia drugs. Veterinary authorities in each

state have the discretion under this law to establish withdrawal times (*i.e.*, a period of time after a drug is administered that must lapse before an animal may be used for food) for specific drugs. Animals that might be consumed by a human within the withdrawal period must be identified. WS would establish procedures for administering drugs used in wildlife capture and handling that would be approved by state veterinary authorities in order to comply with this law.

Clean Water Act (Section 404)

Section 404 (33 U.S.C. 1344) of the Clean Water Act prohibits the discharge of dredged or fill material into waters of the United States without a permit from the United States Army Corps of Engineers unless the specific activity is exempted in 33 CFR 323 or covered by a nationwide permit in 33 CFR 330.

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 use 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.

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)."

Organic Act of 1916 (16 U.S.C. l 2 3, and 4)

The Organic Act provides the fundamental management direction for all units of the national park system "promote and regulate the use of the Federal areas known as national parks, monuments, and reservations . . . by such means and measures as conform to the fundamental purpose of said parks, monuments and reservations, which purpose is to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations."

General Authorities Act of 1970 (16 USC section 1a-1 et seq.)

The General Authorities Act affirms that while all national park system units remain "distinct in character," they are "united through their interrelated purposes and resources into one national park system as cumulative expressions of a single national heritage." The act makes it clear that the NPS Organic Act and other protective mandates apply equally to all units of the national park system. Further, amendments state that NPS management of park units should not "derogat[e] . . . the purposes and values for which these various areas have been established."

Redwoods Act of 1978

The Redwoods Act of 1978 reasserted the systemwide standard of protection established by Congress in the original Organic Act. It stated "Congress further reaffirms, declares, and directs the promotion and regulation of the various areas of the National Park System . . . shall be consistent with and founded in the purpose established by the first section of the Act of August 25, 1916, to the common benefit of all the people of the United States. The authorization of activities shall be construed and the protection, management, and administration of these areas shall be conducted in light of the high public value and integrity of the National Park System and shall not be exercised in derogation of the values and purposes for which these various areas have been established, except as may have been or shall be directly and specifically provided by Congress."

Gateway National Recreation Area Enabling Legislation (Public Law 92-592)

Public Law 92-592 enacted on October 27, 1972 establish Gateway National Recreation Area as a unit of the National Park Service "to preserve and protect for the use and enjoyment of present and future generations an area possessing outstanding natural and recreational features." This legislation identifies that the park shall be administered to "protect the islands and waters within the Jamaica Bay Unit with the primary aim of conserving the natural resources, fish, and wildlife located therein and shall permit no development or use of this area which is incompatible with this purpose"; recognizes the authority of the Secretary of Transportation to maintain and operate existing airway facilities … within the recreation area ... in accordance with plans which are mutually acceptable to the Secretary of the Interior and the Secretary of Transportation and which are consistent with both the purpose of this Act and the purpose of existing statutes dealing with the establishment, maintenance, and operation of airway facilities"; and that the Secretary shall permit hunting, fishing, shellfishing, trapping, and taking of specimens on the lands and waters … in accordance with the applicable laws of the United States and the laws of the States of New York ..., except that the Secretary may designate zones where and establish periods when these

activities may not be permitted for reasons of public safety, administration, fish or wildlife management, or public use and enjoyment".

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. Pertinent portions of the effected environment will be included in this chapter in the discussion of issues used to develop SOPs. 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 prevent and 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 in or around JFK were developed by WS in consultation with the USFWS and the NYSDEC. Issues from the EIS that were considered but not used in the development of alternatives for this EA are described later in Section 3.2. These issues were not included as they were found to be insignificant at the conclusion of the EIS, and they continue to be insignificant when evaluating the scope of this EA.

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 prevent or resolve damage or threats to human safety are categorized into nonlethal and lethal methods. Nonlethal methods available can disperse or otherwise make an area unattractive to target species causing damage, which reduces the presence of the target 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 target animals that could be removed from the population using lethal methods under the alternatives would be dependent on the number of individual birds involved with the associated damage or threat and the efficacy of methods employed. Lethal removal of birds by WS can be conducted under USFWS depredation permits issued to WS or under USFWS depredation permits issued to a cooperator that contracts WS to manage birds on their property. 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 killed from each species in relation to that species' abundance and/or legal status. Magnitude is determined quantitatively, whereas quantitative determinations are based on population estimates, allowable harvest levels, and actual harvest data. 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 JFK and only after the removal of those birds species has been permitted by the USFWS pursuant to the MBTA, when required.

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

A common issue when addressing damage caused by wildlife are the potential impacts of management actions on nontarget species, including threatened and endangered species. Methods available to prevent or 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 nontarget 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 nontarget wildlife.

The ESA makes it illegal for any person to "take" any federally listed endangered or threatened species or negatively impact their critical habitat without a permit. The ESA defines take as, "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct" (16 USC 1531-1544). Critical habitat is a specific geographic area or areas that are essential for the conservation of a threatened or endangered species. The 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.

There may also be concerns that WS' activities could result in the disturbance of bald eagles that may be near or within the vicinity of WS' activities. Under 50 CFR 22.3, the term "disturb," as it relates to take under the Bald and Golden Eagle Act, has been defined as "to agitate or bother bald and golden eagles to a degree that causes, or is likely to cause, based on the best scientific information available, 1) injury to an eagle, 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior." The environmental consequences evaluation conducted in Chapter 3 of this EA will discusses the potential for WS' activities to disturb bald eagles as defined by the Act.

At the state level, the NYSDEC's Endangered Species Program protects animal species listed as threatened or endangered in New York (see Appendix D). This list includes all species listed under the ESA that occur in New York, as well as other species that were once more prevalent in New York. 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-NY will work closely with NYSDEC to monitor listed species in the state. If there is a change in state-listed species, WS-NY will adjust management strategies accordingly and in consultation with NYSDEC.

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 (including air operations) 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.

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 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 only activated when triggered 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). JFK would be made aware through a CSA that those devices agreed upon could potentially be used on property owned or managed by the JFK; thereby, making JFK 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.

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 (previously referred to as “parks and recreation” in the SEIS). 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 nontarget 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 the PANYNJ with bird damages that may request WS' assistance with lethal methods to alleviate their damages, the PANYNJ 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 JFK has attempted to resolve the problem. WS then provides information on appropriate methods that JFK may consider to prevent or 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, nearby golf courses, and state-city parks. 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 JFK personnel, WS can provide FAA sponsored wildlife hazard management training and firearm training to the PANYNJ employees. WS can also participate in airport sponsored outreach days if requested by the PANYNJ. Cooperating agencies frequently collaborate with other entities in education and public information efforts as well. 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/NWRC

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 in wildlife damage management. In 2009, NWRC completed surveys on Long Island to determine if there were any other laughing gull colonies besides the one in Jamaica Bay Wildlife Refuge for translocation purposes. Although NWRC found suitable habitat for laughing gulls, there were no active nesting colonies identified after surveys were complete.

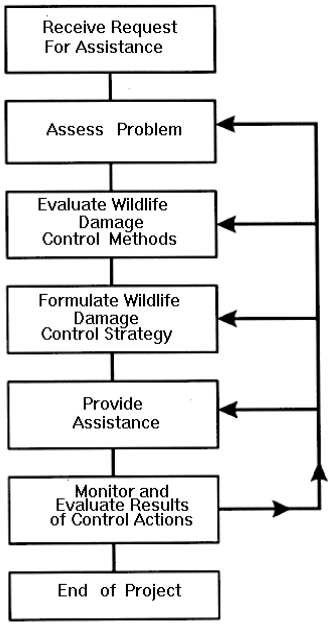

Figure 2.1 WS Decision Model as presented by Slate et al. (1992) for developing a strategy to respond to a request for assistance with human-wildlife conflicts.

WS' Decision Making Procedures

Decision Model

The WS Decision Model (see 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 (Figure 2.1). 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.

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 task force meetings at JFK. The PANYNJ has direct input into the resolution of bird damage or conflicts on JFK property. Other entities such as city/state parks or NPS have direct input on properties owned by their respective agencies, outside of JFK. These entities may choose to 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.

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. This could include properties such as city parks, state parks, or National Park lands. WS could provide technical assistance to this person and provide recommendations to reduce damage. Direct control damage management could be provided by WS if requested, when funding was provided, and the requested actions were within the recommendations made by WS.

2.3 STANDARD OPERATING PROCEDURES (SOPs) 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 be consistently 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 Material 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 would be disposed of in accordance with WS Directive 2.515.

- All personnel who would use chemicals would be 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 property in or around JFK.

- Personnel would be trained in the latest and most humane 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 are directed toward specific birds that are causing or at risk of causing damage.

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

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

- Preference is 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.

- Trapping and translocation of raptors is aligned with WS' Directive 2.501 and the NYC/Long Island District raptor protocols.

Issue 2 - Effects of Damage Management Activities on Nontarget 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 nontarget animal captures.

- Personnel would be present during the use of live-capture methods, or live-traps would be checked in accordance with state/federal regulation or guidance to ensure nontarget species are released immediately or are prevented from being captured.

- The presence of nontarget species would be monitored before using DRC-1339 to reduce the risk of mortality of nontarget species' populations.

- Any nontarget animals captured in cage 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 (Directives: 2.430, 2.615, 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, the NYSDEC, and veterinarian authorities. 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

- Wildlife Services would consider the ramifications of bird damage management on the aesthetic value of birds at a broader landscape level prior to and during management operations.

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 at JFK. The EIS and long history of wildlife damage management at JFK have shown that piecemeal alternatives, as they are listed in the EIS, are not necessary. There was little value gained in evaluating the impacts to relevant issues by segregating off-site versus on-site management approaches during the EIS process.

Additionally, WS and its partners are no longer evaluating the translocation or reduction of the local laughing gull colony as a result of the success of laughing gull management at JFK and the lack of desire by cooperating agencies to pursue this option. Those alternatives not considered in detail are further described in Section 2.5.

Alternative 1 - Continuing the Current Integrated Approach to Managing Wildlife 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 in and around JFK. This approach would integrate the most practical and effective methods available to prevent or 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. JFK personnel, city/town managers, property owners, and others requesting assistance would be provided information regarding the use of appropriate nonlethal and lethal techniques. Management on NPS property would continue to be restricted to the former Pennsylvania and Fountain Avenue landfills and Rulers Bar Hassock, require approval and permitting by NPS on a case-by-case basis, and, be consistent with the methods described under "Drive traps" followed by euthanasia, "Nest/egg destruction", and "Egg oiling" in Appendix B of this document.

To be most effective, damage management activities should begin as soon as birds begin to cause damage or pose a threat to future 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 JFK 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 JFK.

Nonlethal methods recommended and used by WS may include resource management, physical exclusion, human behavior modification, habitat modification, repellents, reproductive control, frightening devices, 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, firearms, 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).

Under this alternative, WS would respond to wildlife hazard situations in three ways: 1) taking no action if warranted, 2) providing only technical assistance to JFK on actions they could take to reduce damages caused by birds, or 3) providing technical assistance and operational assistance to JFK. Operational assistance by WS may include work done by WS under WS' permits or work done by WS under the PANYNJ permit.

The removal of birds can only legally occur as authorized by the USFWS and the 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 and the NYSDEC 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 - Wildlife Damage Management by WS using only Nonlethal Methods

Under this alternative, WS would be restricted to only using nonlethal methods to prevent or resolve damage caused by birds (Appendix B). Nonlethal methods recommended and used by WS may include resource management, physical exclusion, human behavior modification, habitat modification, repellents, reproductive control, frightening devices, trap and translocation, and other deterrents. 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. JFK 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 request assistance (nonlethal or lethal) from a private or public entity other than WS.

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. JFK personnel, city/town managers, property owners, and others requesting assistance would be provided information regarding the use of appropriate nonlethal techniques.

To be most effective, damage management activities should begin as soon as birds begin to cause damage or pose a threat to future 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 JFK 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 JFK.

Under this alternative, WS would respond to wildlife hazard situations in three ways: 1) taking no action if warranted, 2) providing only technical assistance to JFK on actions they could take to reduce damages caused by birds, or 3) providing technical assistance and operational nonlethal assistance to JFK.

Alternative 3 - No Wildlife Damage Management Conducted by WS

This alternative precludes any activities by WS to reduce threats to human health and safety, and alleviate damage to property in and around JFK. 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, JFK 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, and/or 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. However, mute swans are an exception to this and require authorization

from NYSDEC under Environmental Conservation Law. 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 crows, pigeons, blackbirds, starlings, cowbirds, grackles, magpies and gulls, 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 alternatives were identified by WS and other consulted agencies (USFWS, NPS, NYC Department of Sanitation, and NYC Parks); however, those alternatives will not receive detailed analyses in this EA for the reasons provided. Those alternatives considered, but not analyzed in detail include:

IWDM Confined to within JFK Property

This alternative would require that all bird damage management methods be applied only on JFK property. The use of all nonlethal and lethal methods, found in Appendix B, could be employed under this alternative to resolve wildlife/airport conflicts or threats of damage. This alternative is a viable approach to mitigating the potential threats of damage at airports; however the FAA has issued an Advisory Circular (150/5200-33C) that directs airports to consider hazardous wildlife on or near airports and the adjacent land uses that cause wildlife to move into, onto, or across the airport's operation area. According to the Advisory Circular, this area is a 5-7 mile radius around the airport and includes any approach, departure, and circling airspace. Therefore, it is the responsibility of the airport to consider land uses off-airport property in addition to on the property itself. Under this alternative, JFK can choose to use WS for an IWDM approach or use other wildlife management agencies, local animal control agencies, or private businesses or organizations. JFK must use the standards set in the Advisory Circular and consider the impacts that nearby off-airport properties can have on wildlife movements on the airport. Therefore, this alternative was not analyzed in detail.

Changing Schedules and Flight Patterns at JFK

An alternative to alter the flight schedules to limit morning arrivals and departures was suggested. This timing coincides with peak movements of birds and a decrease in aircraft movements at this time might decrease the amount of wildlife strikes. However, according to the FAA, from 2000 to 2017 only 7% of wildlife strikes occur at dawn and dusk, compared to 56% during the day and 37% at night (FAA 2018). These statistics directly coincide with aircraft movements during a 24-hour period where most movements are during the day and fewer are at dawn and dusk. Limiting air travel at dawn will likely not significantly reduce the number of wildlife strikes at JFK since it is during a time period of fewer strikes to begin with. In addition, airlines take into account several specific variables such as bad weather, airport construction, airport infrastructure (number of gates, number of runways open), connections, and passenger deplane time into account when calculating airline schedules, and it is therefore not an easy process to deviate far from existing schedules. Changing flight patterns is another alternative that may be considered to limit bird strikes at JFK. Like flight schedules, flight patterns are also based on several factors, including passenger and air-carrier demand, the capacity of JFK to handle aircraft traffic, and the need to coordinate traffic patterns with nearby LaGuardia and Newark Liberty International Airports (USDA 2012). Coordination between these three airports in regards to flight patterns is essential to address human health and safety concerns. Significant changes in flight patterns at JFK would necessitate shifts at both LaGuardia and Newark, each of which have their own bird hazards to consider. Due to the complexity of changing airport movement schedules and patterns, and the fact that WS does not have the authority to do so, this alternative was not analyzed in detail.

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. 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 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 at or around JFK. 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 deemed effective, 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.

Translocation of wildlife is typically discouraged by WS policy (WS Directive 2.501) because of the stress to the translocated animal, occasional poor survival rates, and the difficulties that translocated wildlife have with adapting to new locations or habitats (Nielsen 1988).

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.

Translocate Laughing Gull Colony

This alternative was discussed in the 2012 SEIS (USDA 2012) as a management strategy that could mitigate gull strikes at JFK. This strategy was omitted from consideration based on the difficulty of translocating an established laughing gull colony and concerns that the activity may lead to adverse impacts on nesting nontarget species and saltmarsh habitat. Additionally, mitigation measures concerning site selection of the translocation could not include areas inhabited by terns, piping plovers, or other gulls.

This provision was established to avoid disruption and competition with state and federally-listed species or species of conservation concern. It also would reduce the likelihood of problems with larger, predatory gulls. Relocation sites were reviewed by cooperating agencies and the NWRC completed surveys on Long Island to identify other laughing gull colonies in 2009. While other suitable habitat was identified during the surveys, no nesting laughing gull colonies were found on Long Island in 2009.

Technical Assistance Only

This alternative would restrict WS to only providing technical assistance (advice) on bird damage management on or around JFK. 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.

Reducing Damage by Managing Canada Goose Populations through the Use of Reproductive Inhibitors Only

Under this alternative, the only method available to resolve requests for assistance involving Canada geese would be the recommendation and the use of reproductive inhibitors to reduce or prevent reproduction in geese posing a threat to JFK. Reproductive inhibitors are often considered for use where wildlife populations are overabundant and where traditional hunting or lethal management are not publicly acceptable (Muller et al. 1997). Use and effectiveness of reproductive control as a population management tool is limited by population dynamic characteristics (e.g., longevity, age at onset of reproduction, population size, and biological/cultural carrying capacity), habitat and environmental factors (e.g., isolation of target population, cover types, and access to target individuals), socioeconomic factors, and other factors.

Reproductive control for geese could be accomplished through sterilization (permanent) or contraception (reversible). Sterilization could be accomplished through surgical sterilization (vasectomy, castration, and tubal ligation), chemosterilization, or gene therapy. Contraception could be accomplished through hormone implantation (synthetic steroids such as progestins), immunocontraception (contraceptive vaccines), or oral contraception (progestin administered daily).

Although male Canada geese have been successfully sterilized to prevent production of young (Converse and Kennelly 1994), this method is only effective if the female does not form a bond with a different male. The female goose is not always faithful and may produce viable eggs through copulation with other males (N. Clum, Bronx Zoo pers. comm. 2009). Additionally, pair bonds in resident Canada geese only last four to five years (N. Clum, Bronx Zoo pers. comm. 2009) after which the male and female will seek different mates. The ability to identify breeding pairs for isolation and to capture a male bird for vasectomization becomes increasingly difficult as the number of birds increase (Converse and Kennelly 1994). Geese have a long life span once they survive their first year (Cramp and Simmons 1977, Allan et al. 1995); leg-band recovery data indicate that some waterfowl live longer than 20 years. The oldest reported Canada goose was reportedly 30 years and 4 months old, but the average lifespan is 10-24 years (Johnson 2012, Jansson, et al. 2008, Robinson 2005).

The sterilization of resident geese would not immediately reduce the damage caused by the overabundance of the goose population, if ever, as the population would remain stable for many years. Furthermore, Keefe (1996) estimated sterilization of a Canada goose can cost over $100 per bird.

Population modeling indicates that reproductive control is more effective than lethal control only for some rodent and small bird species with high reproductive rates and low survival rates (Dolbeer 1998). Additionally, the need to treat a sufficiently large number of Canada geese, the need for multiple treatments, and the population dynamics of free-ranging goose populations place considerable logistic and economic constraints on the adoption of reproductive control technologies as a management tool for Canada geese.

Currently, the only reproductive inhibitor registered with the EPA and NYSDEC is nicarbazin (EPA 2005), which is not registered for use with Canada geese.

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: 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 use 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. 2017). 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. 2017).

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 (CBC)

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 2018a).

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, Canada goose, 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 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.

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. However, the depredation orders do not mandate reporting of harvested crows.

Alternative 1 - Continuing the Current Integrated Approach to Managing Wildlife 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 prevent or resolve bird damage or threats of damage at JFK. WS' lethal removal is monitored by comparing numbers of animals killed with overall populations or trends 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 was unavailable. 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 as determined by the BBS 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 feasible (WS Directive 2.101). However, nonlethal methods would not necessarily be employed or recommended to resolve every situation at or around JFK if deemed inappropriate by WS' personnel using the WS Decision Model. For example, if JFK has already used nonlethal methods to resolve a specific problem with minimal or no effectiveness, WS would not likely recommend or continue to employ those particular methods since 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. 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 on birds 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 number of birds removed from the population using lethal methods would be dependent on the number of birds involved with the associated damage or threat and the efficacy of methods employed. WS and other entities also lethally remove birds throughout the state. This is referenced below for each species as "WS statewide proposed removal." While the direct impacts of this removal is analyzed under other NEPA processes, WS still includes this removal in its cumulative impact analysis. 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. Occasionally, WS has to take emergency action, as authorized by the USFWS permit, to take an unanticipated species. These situations are rare and the take of one or even a few of a single species (outside of T&E species or eagles) will not have a significant impact on those species' populations. The most recent example of this was the emergency take of a Caspian tern from JFK in June 2018 as a response to protect human health and safety and airport property.

Establishing hunting and trapping seasons and the allowed take during those seasons is the responsibility of the NYSDEC. WS does not have the authority to establish hunting or trapping seasons or to set allowed harvest numbers during those seasons. However, the harvest of those birds with hunting and/or trapping seasons would be occurring in addition to any take that could occur by WS under the alternatives or recommended by WS.

Inconsequential/Undetectable Target Species Removal

Bird management conducted by WS is often associated with species that have healthy and thriving populations. WS believes it reasonable 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.

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 3.1 (non-game species) and 3.2 (game species) list the birds that fall under this category.

Table 3.1 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 Annual Take	WS Take as Percent of the State Population Data
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	9,800	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 from the NYSDEC.

Table 3.2 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 Annual Take	WS Proposed Annual Removal as Percent of Population Data
American black duck	10,000		50	0.50
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 from 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 at JFK:

- One

WS' statewide 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 change from 1966-2015: **+15.84%**
- BBS Eastern Region population change from 1966-2015: **+8.32%**

Impacts to bald eagle population:

- WS highest yearly dispersal from FY 2013-FY 2017: **6**
- 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). The large body size and soaring behavior of eagles can pose threats of aircraft strikes when eagles fly near JFK. WS used nonlethal methods to disperse six bald eagles at other airports in 2017. No eagle harassment was required in the past four years at JFK, but could be required in future years to prevent aircraft/wildlife strikes.

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 eagle 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. The 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 2018a). 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). 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 2016a). 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).

Direct, Indirect, and Cumulative Effects:

WS could employ harassment and/or trapping methods to disperse bald eagles and remove up to one active/inactive nest annually from JFK and its surrounding area to protect human health and safety when authorized and permitted by the USFWS pursuant to the Act. Therefore, if no permit is issued by the USFWS to harass bald eagles or remove their nests, no harassment or nest removal would be conducted by WS. Harassment may actually benefit individual eagles by preventing these birds from being fatally injured in collisions with aircraft. Additionally, capturing injured eagles for transportation to a licensed

rehabilitator can potentially benefit local eagle populations. 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 required by the USFWS in permits issued for the harassment of bald eagles at JFK. The USFWS evaluates each nest removal and its potential impacts on a case-by-case basis. 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 at JFK:

- Up to **10**

WS' statewide proposed annual removal:

- Up to **750**

Black vulture population statistics:

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

Impacts to black vulture population:

- WS proposed removal at JFK as percent of USFWS Region 5 population: **0.004%**
- WS statewide proposed removal as percent of USFWS Region 5 population: **0.27%**
- Non-WS authorized take*: **40**
- Cumulative removal as percent of North American population: **0.28%**

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

Black vultures historically occurred in the southeastern United States, Texas, Mexico, and parts of Arizona (Wilbur 1983). Black vultures' range has expanded 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 (Wilson et al. 2012). This species has been reported to live up to 25 years (Henny 1990).

There are no reliable population estimates available for black vultures residing within New York; however the North American 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). Black vulture observations are becoming more numerous in New York State. The number of black vultures observed in the eastern BBS region have 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 2018a). Similar to other states that have experienced the northward range expansion, New York has also noted an increase in black vulture conflicts (USDA Hudson Valley Black Vulture Management Plan 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.

WS removed 40 vultures in one year since 2014. 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:

Operational assistance conducted by WS on black vultures could occur at any time during 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 10 black vultures at JFK will have no adverse direct effects on black vulture North American populations.

WS does not expect there to be adverse cumulative impacts on black vulture populations from WS proposed statewide removal combined with the potential authorized removal from all non-WS entities. The cumulative removal of black vultures by all entities in New York represents 0.28% of the USFWS Region 5 population. The removal of black vultures can only occur when authorized through the issuance of USFWS depredation permits. This ensures removal by all entities occurs within allowable levels as regulated by the USFWS.

Canada Goose Biology and Population Impacts

WS' proposed annual removal at JFK:

- Up to **750 birds**
- Up to **100 nests**

WS' statewide proposed annual removal:

- Up to **7,000 birds**
- Up to **500 nests**

Canada goose population statistics:

- New York resident population estimate: **230,510**
- Christmas Bird Count average for New York from 2012-2016: **264,721**
- BBS New York population trend from 1966-2015: **+7.97%**
- BBS Eastern Region population trend from 1966-2015: **+11.92%**

Impacts to Canada goose population:

- WS proposed removal at JFK as percent of New York population: **0.33%**
- WS statewide proposed removal as percent of New York resident population: **3.04%**
- New York September average hunter harvest estimate for 2011-2015: **56,720**
- Non-WS authorized resident population take[*]: **6,224**

- Cumulative resident removal as percent of resident breeding population†: **30.3%**
- 2013-2017 average JFK removal as a percent of resident breeding population: **0.22%**

*Highest authorized annual take from 2013-2017 for entities other than WS as permitted by USFWS.
†Includes the 2011-2015 average September hunting harvest, non-WS entities, and WS' proposed removal.

Historically in the Atlantic flyway, Canada geese resided in Canada and other northern latitudes during the breeding season and migrated south to spend the winter in more temperate climates (USFWS 2005). However, releases of domestic and semi-domestic birds from captive flocks and the relocation and artificial introduction of these geese by management agencies has resulted in populations of geese which breed and reside year-round south of their natural range (Robinson 1924, Mowbray et al. 2002, USFWS 2005, USFWS 2014). Local flocks were established in New York starting in the 1950s from intentional release by the State Conservation Department (NYSDEC 2019b). Preferred habitat includes prairie, arctic plains, mountain meadows, agricultural areas, reservoirs, sewage lagoons, parks, golf courses, lawn-rich suburban areas, or other similar areas not far from permanent sources of water. Canada geese nest once per year, laying 2 to 8 eggs; with birds re-nesting if the first nest is destroyed. Canada geese are highly social birds gathering in flocks which number in the thousands (Mowbray et al. 2002).

Canada geese are generally classified by two types of migration status: resident or migratory. They are considered "resident" when one of the following criteria is met: 1) nest and/or reside on a year round basis within the contiguous United States; 2) nest within the lower 48 States during the months of March, April, May, or June; or 3) reside within the lower 48 States and the District of Columbia in the months of April, May, June, July, and August (see 50 CFR 20.11, USFWS 2005). Therefore, during much of the year, the majority of Canada geese present in New York are resident.

Migratory Canada geese nest across Alaska and Canada, migrating south to the U.S. and Mexico during the winter months (Mowbray et al. 2002). The migratory Canada geese that can be observed in New York come from several distinct populations: the North Atlantic Population (NAP), Atlantic Population (AP), and the Southern James Bay Population (SJBP) (USFWS 2015). The NAP nest in Newfoundland and Labrador, wintering in coastal areas as far south as North Carolina (USFWS 2015). The AP nest throughout much of Quebec and the eastern shore of Hudson Bay and winters from New England to South Carolina, with the largest concentrations on the Delmarva Peninsula. The SJBP nest on Akimiski Island and in the Hudson Bay lowlands to the west and south of James Bay, wintering from Southern Ontario and Michigan south to Mississippi, Alabama, Georgia, and South Carolina.

Landowners, property managers, state agencies, and federal agencies are required to obtain migratory bird depredation permits with specified limits on the number of Canada geese removed. In New York, Canada geese are classified as a migratory game bird species and are regulated by state law. Resident Canada geese still fall under the jurisdiction of the USFWS even if they rarely migrate. Canada goose hunting seasons are regulated by the NYSDEC and USFWS.

The New York state population estimate for resident geese is 230,510. The number of resident breeding Canada geese lethally removed by all known sources within New York is shown in Table 3.3. According to USFWS data, the highest authorized annual removal during the last five years by non-WS entities in any one year was 6,224 birds. This number, in addition to the WS proposed removal and September harvest estimate, was used to assess the cumulative removal. Most requests for assistance received by WS occur April through August, when geese present in New York are considered resident. The number of migrant Canada geese lethally removed by WS is not expected to have any significant impact on regional or flyway goose populations. According to the International Union for Conservation of Nature Canada geese are classified as a *least concern* species (IUCN 2017).

Table 3.3 Number of Canada geese taken by WS and other entities in New York from FY 2013 - FY 2017 (birds + nests)

	Removal under Depredation Permits	
Year	WS' Permits[1,2]	Other Entities' Permits[2]
2013	3,379 + 265	2,034 + 14
2014	3,050 + 305	1,800 + 181
2015	3,042 + 292	1,644 + 48
2016	3,212 + 60	1,343 + 111
2017	2,345 + 107	854 + 6
Average	**3,006 + 206**	**1,535 + 72**

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

The number of Canada goose/aircraft strikes has increased in concert with an increase in goose populations in North America. Resident Canada geese are primarily responsible to this overall population increase, as migratory geese populations have remained relatively stable since 1990 (Dolbeer and Seubert 2006). WS-New York proposes to remain consistent with the International Bird Strike Committee Best Practice Standards for wildlife hazard control at airports and recommends airports reduce wildlife attractants and associated wildlife hazards within a 13 km (7.8 mile) circle around the airport. Therefore, WS suggests conducting Canada goose roundups within a 7 mile buffer of JFK, including on National Park Service lands, to mitigate the threat to human health and safety.

Areas such as Gateway NRA, Jamaica Bay Wildlife Refuge offer sufficient habitat for resident Canada geese to congregate in large numbers near JFK. Within NYC, geese may actually be more attracted to places such as Jamaica Bay Wildlife Refuge due to the ample habitat and food availability considering the surrounding urban landscape. Furthermore, as a gregarious species, it is quite possible for geese found within Gateway NRA to attract other geese from outside the area to explore the resource rich habitat.

NPS policies provide guidance for management of plant and animal species, stating that natural processes will be relied upon whenever possible. The NPS may intervene to manage individuals or populations of native species only when such intervention will not cause unacceptable impacts to the populations of the species or to other components and processes of the ecosystems that support them. Along with this first condition, other factors that must be met include but are not limited to: protect property when it is not possible to change the pattern of human activities; or to maintain human safety when it is not possible to change the pattern of human activities (NPS 2006). Local population management of geese would comply with these NPS policies. All actions conducted at Gateway NRA would only be conducted with the consent of the park supervisor and in coordination with park staff.

The live capture and euthanasia of resident Canada geese at Gateway NRA would be the most effective and efficient means of reducing risks to aviation safety. In August of 2019, 249 Canada geese were observed by WS personnel at Rulers Bar Hassock. Geese coming from this island frequently cross Runway 13R/31L near the 13R approach or fly parallel along the 13R/31L runway and cross the north-south runways 4/22 R and L before exiting the east side of the airport. The sites of the now-closed Pennsylvania Avenue and Fountain Avenue Landfills, are located west of the airport, and are within the approach and departure pathways for JFK. The two sites have been deeded to the National Park Service. During the 2018 summer post-molt surveys, there were 104 Canada geese observed at the landfills. Canada geese that were banded at the landfills have been observed or shot at JFK.

WS' management efforts to protect human health and safety and property may also help Jamaica Bay restoration efforts by reducing the number of resident geese in the area that graze on wetland vegetation such as smooth cordgrass. WS management efforts may include a roundup of Canada geese, but several guidelines would be used to determine whether a roundup would be necessary. On the day of the scheduled roundup, 10 or more resident Canada geese would need to be present at sites within five miles

or 20 or more geese would need to be present within the 5-7 mile buffer around JFK. From 2013-2017, WS removed an average of 510 Canada geese annually on or within seven miles of JFK property, which represents 0.22% of the resident breeding population in the state.

Management actions by WS that may result in the lethal removal of migratory Canada geese would be for the protection of human health and safety and for the protection of property at JFK. Canada goose management at these facilities is conducted throughout the year whenever the threat arises, and although nonlethal means are used when possible to reduce threats from Canada geese, lethal control is sometimes necessary. While the potential to lethally remove migratory Canada geese may increase, minimal lethal control combined with extensive nonlethal measures should minimize the lethal removal of migratory geese. Additionally, although it is possible that geese lethally removed between September and March are migratory Canada geese, it is just as likely that these geese are resident individuals.

The use of harassment only to disperse Canada geese from the area around JFK was found to be ineffective because geese tended to stay within three miles of where they were dispersed (Preusser et al. 2008). In response, the PANYNJ adopted a resident Canada goose management initiative in 2009 to deal with the overpopulation problem, which uses a variety of management techniques including both lethal and nonlethal methods. The main goal from this management approach is to increase aviation safety while managing Canada geese responsibly. Additionally, this initiative supports the goal identified by both the NYSDEC and USFWS that resident goose populations in New York State should be ≤85,000 with a distribution of 0.8 geese/km^2 (Atlantic Flyway council 2011). Current results from the 2009 Canada goose management project, show a reduction in Canada goose strikes at JFK from 0.18 strikes/100,000 aircraft movements (from 2000-2008) to 0.10 strikes/100,000 aircraft movements (from 2009-2017) (USDA 2018*b*).

Direct, Indirect, and Cumulative Effects:

WS' proposed removal level at JFK will have no adverse direct, indirect, or cumulative effects on statewide Canada goose populations. Geese may be removed from a few to several sites within the project area (7-mile radius of JFK airport) depending on their location during the molting period. However, WS will not remove more than 750 Canada geese per year from within the project area or from any specific site, including Gateway NRA. WS' proposed removal level at JFK represents only 0.33% of the estimated statewide resident population. WS does not typically remove geese during the migratory goose hunting period; however, as indicated above, minimal numbers of geese are occasionally removed during this period when present within the airport operations area of JFK for the protection of human safety.

Canada goose management at Gateway NRA will continue to be necessary as an integral component to protect human health and safety and JFK airport property. Canada goose management at Gateway NRA would be consistent with the methods described under "Drive traps" followed by euthanasia, "Nest/egg destruction", and "Egg oiling" in Appendix B of this document. . From 2013-2017, an average of 97 Canada geese were removed during the molting period during management efforts at Gateway NRA. The impacts from these local population reductions are temporary due to the high mobility of Canada geese within the entire bay area after the molt, allowing them to gradually repopulate areas such as Gateway NRA. While the removal of Canada geese in Gateway NRA reduces risks to aviation safety, geese are still observed annually within the recreation area after management efforts are concluded. Due to their high mobility outside of the molting period and the fact that WS' management efforts only occur at several pre-determined sites within the 7-mile radius of JFK airport, Canada goose management removals will not have a significant impact on the local Canada goose population at Gateway NRA. Annual population management at Gateway NRA will also support the NYSDEC and USFWS goal of a 0.8 geese/km^2 distribution throughout the project area (Atlantic Flyway council 2011).

As with the lethal removal of geese, the destruction of nests and/or eggs (which may involve treatment of eggs by oiling, puncturing, or addling to inhibit reproduction) must be authorized by the USFWS through depredation permits, depredation orders, or control orders. The removal of up to 100 resident Canada goose nests annually by WS in and around JFK would not reach a level where adverse effects on resident populations would occur. Indeed nest treatment occurs during the time of year where only resident geese are present in New York.

WS's annual lethal removal of Canada geese will have no effect on the sport hunting community's opportunity to harvest geese. While WS' proposed removal of 750 individuals represents 1.51% of the average annual September harvest in New York, most of these birds are not accessible to hunters due to their location in non-hunting areas in or around JFK. Further, the population trend for resident Canada geese has been increasing substantially for the past several years (Sauer et al. 2017).

The total potential lethal removal by all non-WS entities and WS' proposed removal is not expected to create significant impacts to Canada goose populations. While the cumulative lethal removal represents 30.3% of the resident population annually, state goose populations are still far exceeding the recommended population level of 85,000 birds. Additionally, the removal of Canada geese by WS would only occur at levels authorized by the USFWS and NYSDEC, which ensures WS' removal and removal by all entities, including hunter harvest, would be considered to achieve these agencies' desired statewide population goals for Canada geese. Provided that the goose population remains at levels that would sustain an annual harvest, WS' removal is of low magnitude when compared to the number of geese harvested by sport hunters.

Double-crested Cormorant Biology and Population Impacts

WS' proposed annual removal at JFK:

- Up to **250 birds**
- Up to **50 nests**

WS' statewide 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 from 1966-2015: **+18.65%**
- BBS Eastern Region population trend from 1966-2015: **+4.17%**

Impacts to double-crested cormorant population:

- WS proposed removal at JFK as percent of New York population: **0.58%**
- WS statewide proposed removal as percent of New York population: **4.65%**
- Non-WS authorized take:* **990**
- Cumulative removal as percent of population: **6.95%**
- 2013-2017 average JFK removal as a percent of New York population: **0.20%**

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

Double-crested cormorants range throughout North America (Cornell Lab of Ornithology 2015). The double-crested cormorant is one of six species of cormorants breeding in North America and has the widest range (Hatch 1995). 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. 2001). 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 (BBS 2017). CBC data has corroborated the healthy population status of double-crested cormorants throughout New York with an average CBC count of 798 individuals and an increasing trend in the state over the last 10 years' worth of data from 2008-2017. Wires et al. (2001) and Jackson and Jackson (1995) have suggested that the cormorant resurgence in the past two decades 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, removal can occur pursuant to the MBTA through depredation permits issued by the USFWS. Removal of double-crested cormorants in New York can occur under depredation order 50 CFR 21.48, 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 3.5. 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 values were used to assess the cumulative removal.

Table 3.5 Number of double-crested cormorants removed by WS and other entities in New York from FY 2013 - FY 2017 (birds + nests)

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

[1]WS' removal under a depredation permit issued to WS in New York; additional removals by WS under permits held by the PANYNJ 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 250 double-crested cormorants at JFK would only represent 0.58% of the New York population and will have no significant adverse direct effects on double-crested cormorant populations. There could be a minimal impact on the nesting and/or breeding success of individuals that are in close proximity to JFK if management efforts are conducted in the spring. This localized impact would be temporary and therefore would not cause adverse effects on the statewide double-crested cormorant populations. Additionally, the combination of all WS take and

other entities take would equal 6.95% of the New York population, and is therefore not expected to have any cumulative effects on double-crested cormorant populations. From 2013-2017, WS removed an average of 84 double-crested cormorants annually on JFK property, which represents only 0.20% of the state population. This is further indication that WS' management at JFK has had no long term significant impacts to the cormorant population.

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. The removal of up to 50 double-crested cormorant nests annually by WS at JFK would occur in localized areas and would not reach a level where diminished population recruitment occurs. 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, ensuring population sustainability.

European Starling Biology and Population Impacts

WS' proposed annual removal at JFK:

- Up to **3,000**

WS' statewide 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 at JFK as percent of New York population: **0.12%**
- WS statewide proposed removal as percent of New York population: **9.62%**
- 2013-2017 average JFK removal as a percent of the state population: **0.04%**

European starlings are an Old World passerine species introduced in the eastern U.S. in the late 1800s. Starling are found year-round throughout New York (Cornell Lab of Ornithology 2015). Starlings nest in cavities and will readily evict most native cavity-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 (Wilson et al. 2012). According to the International Union for Conservation of Nature, European starlings are classified as a *least concern* species (IUCN 2017). The New York population of European starlings was estimated to be approximately 2,600,000 individuals (Partners in Flight 2019).

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 their removal. 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. The number of starlings lethally removed by other entities to alleviate damage or threats is

unknown since the reporting of starling removal is not required. The number of starlings dispersed and lethally removed by WS from FY 2013 through FY 2017 can be seen in Table 3.6.

Table 3.6 Number of European starlings dispersed and removed by WS at JFK from FY 2013 to FY 2017. These totals include birds removed under the PANYNJ permit.

Year	Dispersed by WS[1]	Removed by WS[1]
2013	3,924	435
2014	14,086	547
2015	9,897	841
2016	18,443	1,290
2017	23,360	2,367
Average	**13,942**	**1,096**

[1]Data reported by federal fiscal year.
[2]Data provided by the PANYNJ.

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 fecund and adaptable to changes in the environment, which allows for rapid population recoveries. WS' proposed removal level at JFK will have no significant adverse direct or indirect effects on European starling populations in New York and represents only 0.12% of the statewide population. 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. From 2013-2017, WS removed an average of 1,096 European starlings annually on JFK property on behalf of the PANYNJ, which represents 0.04% of the statewide population.

Feral Waterfowl Biology and Population Impacts

WS' proposed annual removal at JFK:

- Up to **10**

WS' statewide proposed annual removal:

- Up to **50**

Feral waterfowl population statistics:

- This information is unavailable as these species are not monitored or regulated by the USFWS, the NYSDEC, 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, peking 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 mallards (Drilling et al. 2002).

Many waterfowl of domestic or semi-wild genetic backgrounds have been released by humans into rural and urban environments. Selective breeding has resulted in the development of numerous domestic

varieties of mallard ducks 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 are considered 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.

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 10 feral ducks or feral geese from JFK. 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 removal 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 10 feral ducks or feral geese and 20 nests would not significantly adversely affect populations of those feral species.

Glossy Ibis Biology and Population Impacts

WS' proposed annual removal at JFK:

- Up to **20**

WS' statewide proposed annual removal:

- Up to **75**

Glossy ibis population statistics:

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

Impacts to glossy ibis population:

- WS proposed removal at JFK as percent of the global population: **0.002%**
- WS statewide proposed removal as percent of global population: **0.009%**
- Non-WS authorized take:* **5**
- Cumulative removal as percent of population: **0.01%**
- 2013-2017 average JFK removal as a percent of the global population: **0.0003%**

*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 2018b). 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. Both males and females contribute to feeding their young (NAS 2018b).

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 increase of 4.24% in the glossy ibis population since 1966 (BBS 2017). 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. According to the USFWS data, there were 16 glossy ibises removed in New York by other entities during this same time. 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 values were used to assess the cumulative removal.

Direct, Indirect, and Cumulative Effects:

The removal of 20 glossy ibises at JFK by WS would represent 0.002% 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 significant 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 significant cumulative impacts. From 2013-2017, WS removed an average of three glossy ibises annually on JFK property, which represents 0.0003% of the global population.

Great Blue Heron Biology and Population Impacts

WS' proposed annual removal at JFK:

- Up to **10**

WS' statewide proposed annual removal:

- Up to **50**

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 trend from 1966-2015: **+1.33%**
- BBS Eastern Region population trend from 1966-2015: **+0.33 %**

Impacts to great blue heron population:

- WS proposed removal at JFK as percent of continental population: **0.01%**
- WS statewide proposed removal as percent of continental population: **0.06%**
- Non-Wildlife Services authorized take*: **165**
- Cumulative removal as percent of continental population: **0.26%**

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

The great blue heron is the largest heron in North America (NAS 2018b). This common widespread wading bird can be found throughout most of North America and can be found year-around 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). Great blue herons breed in colonies that can be very large, and eat a highly variable diet.

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 3.7. According to USFWS data, the highest authorized annual removal over the last 5 years by non-WS entities was 165 birds. This number in addition to the WS proposed removal values were used to assess the cumulative removal.

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

Year	Removal under Depredation Permits	
	WS' Permits[1,2]	Other Entities' Permits[2]
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 the PANYNJ 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 10 great blue herons at JFK by WS would represent 0.01% 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 at JFK:

- Up to **10**

WS' statewide proposed annual removal:

- Up to **50**

Great egret population statistics:

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

Impacts to great egret population:

- WS proposed removal at JFK as percent of continental population: **0.006%**
- WS statewide proposed removal as percent of continental population: **0.028%**
- Non-Wildlife Services authorized take*: **25**
- Cumulative removal as percent of continental population: **0.042%**

*Highest authorized annual take from 2013-2017 for entities other than Wildlife Services 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 JFK.

The USFWS data reports that the highest authorized annual removal over the last 5 years by non-WS entities was 25 birds, however none were taken. This number in addition to the WS proposed removal values were 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 10 individuals at JFK would constitute only 0.006% 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 at JFK:

- Up to **100 birds**
- Up to **50 nests**

WS' statewide proposed annual removal:

- Up to **300 birds**
- 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 from 1966-2015: **+5.33%**
- BBS Eastern Region population trend from 1966-2015: **-5.81%**

Impacts to great black-backed gull population:

- WS proposed removal at JFK as percent of the continental population: **0.08%**
- WS statewide proposed removal as percent of the continental population: **0.25%**
- Non-WS authorized removal*: **1,695**
- Cumulative removal as percent of the continental population: **1.63 %**
- 2013-2017 average JFK removal as a percent of the continental population: **0.06%**

*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 North American population of great black-backed gulls 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 3.8. 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 values were used to assess the cumulative removal.

Table 3.8 Number of great black-backed gulls removed by WS and other entities in New York from FY 2013 - FY 2017 (birds + nests).

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

[1]WS' removal under a depredation permit issued to WS in New York; additional removals by WS under permits held by the PANYNJ 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 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 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. From 2013-2017, WS removed an average of 72 great black-backed gulls annually on JFK property, which represents 0.06% of the global population.

Impacts due to the proposed removal of up to 50 nests at JFK 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 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 at JFK:

- Up to **750 birds**
- Up to **50 nests**

WS' statewide proposed annual removal:

- Up to **2,500 birds**
- 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 from 1966-2015: **-1.89%**
- BBS Eastern Region population trend from 1966-2015: **-3.51%**

Impacts to herring gull population:

- WS proposed removal at JFK as percent of continental population: **0.3%**
- WS statewide proposed removal as percent of continental population: **1.02%**
- Non-WS authorized removal*: **5,020**
- Cumulative removal as percent of population: **3.06%**
- 2013-2017 average JFK removal as a percent of the continental population: **0.2%**

*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 2015). The average number of herring gulls observed in areas surveyed in the New York 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 3.9. 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 values were used to assess the cumulative removal.

Table 3.9 Number of herring gulls removed by WS and other entities in New York from FY 2013 to FY 2017 (birds + nests).

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

[1]WS' removal under a depredation permit issued to WS in New York; additional removals by WS under permits held by the PANYNJ 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 750 herring gulls would represent 0.3% of the continental population of herring gulls. Additionally, this proposed removal would represent 1.9% 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' statewide proposed removal would represent 3.06% of the continental population, or 19.1% of the average number of herring gulls observed in New York during the CBC in the past five years. The removal of herring gulls can only occur when permitted by the USFWS through the issuance of depredation permits. From 2013-2017, WS removed an average of 496 herring gulls annually on JFK property which represents 0.2% of the continental population.

Impacts due to the authorized removal of up to 50 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 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 at JFK:

- Up to **3,500 birds**
- Up to **50 nests**

WS' statewide 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 from 1966-2015: **+1.90%**

Impacts to laughing gull population:

- WS proposed removal at JFK as percent of global population: **0.61%**
- WS statewide proposed removal as percent of global population: **0.66%**
- Non-WS authorized removal[*]: **8,650**
- Cumulative removal as percent of population: **2.18%**
- 2013-2017 average JFK removal as a percent of the global population: **0.25%**

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

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). In New York, an active nesting colony of laughing gulls exists in Joco Marsh within Jamaica Bay Wildlife Refuge and adjacent to JFK. This colony supports thousands of laughing gulls during the nesting season and is currently one of two nesting colonies found in New York.

Based on the BBS Eastern region there was a 1.90% increase in population from 1996-2015 (BBS 2017). According to the International Union for Conservation of Nature the laughing gull is classified as a *least concern* species (IUCN 2017).

The number of laughing 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 over the last five years by non-WS entities was 8,650 birds. This number in addition to the WS proposed removal values were used to assess the cumulative removal.

Table 3.10 Number of laughing gulls removed by WS and other entities in New York from FY 2013 to FY 2017 (birds + nests).

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

[1]WS' removal under a depredation permit issued to WS in New York; additional removals by WS under permits held by the PANYNJ 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 3,500 laughing gulls at JFK by WS under the proposed action alternative would represent 0.61% 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 significant direct or indirect effects on laughing gull populations. Additionally, the highest combined authorized removal by non-WS entities in addition to WS' statewide proposed removal would represent 2.18% of the global population of laughing gulls. From 2013-2017, WS removed an average of 1,453 laughing gulls annually on JFK property, which represents 0.25% of the global population.

Additionally, the removal of 50 laughing gull nests at JFK 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 at JFK:

- Up to **200 birds**
- Up to **50 nests**

WS' statewide proposed annual removal:

- Up to **2,500 birds**
- 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 from 1966-2015: **+9.44%**
- BBS Eastern Region population trend from 1966-2015: **+3.34%**

Impacts to ring-billed gull population:

- WS proposed removal at JFK as percent of North American continental population: **0.02%**
- WS statewide proposed removal as percent of North American continental population: **0.21%**
- Non-WS authorized removal*: **5,975**
- Cumulative removal as percent of population: **0.72%**
- 2013-2017 average JFK removal as a percent of the North American continental population: **0.008%**

*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. 2001, 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 2018a). Additionally, the breeding bird survey results exhibited 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 3.11. According to USFWS data, the highest authorized annual removal over the last five years by non-WS entities was 5,975 birds. This number in addition to the WS proposed removal values were used to assess the cumulative removal.

Table 3.11 Number of ring-billed gulls removed by WS and other entities in New York from FY 2013 to FY 2017 birds + nests).

Year	Removal under Depredation Permits	
	WS' Permits[1,2]	Other Entities' Permits[2]
2013	831 + 1,787	967 + 790

2014	964 + 3,029	1,838 + 575
2015	541 + 4,101	1,083 + 1,242
2016	606 + 2,369	939 + 212
2017	1,123 + 3,437	369 + 21
Average	**813 + 2,944.6**	**1,039.2 + 568**

[1]WS' removal under a depredation permit issued to WS in New York; additional removals by WS under permits held by the PANYNJ 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 200 ring-billed gulls at JFK will not have significant adverse direct or indirect effects on overall populations. WS' JFK proposed removal of 200 ring-billed gulls would represent 0.02% of the North American population. The highest combined authorized removal by non-WS entities in addition to WS' statewide proposed removal would represent 0.72% of the North American population. In addition, WS would only remove ring-billed gulls at levels permitted by the USFWS through the issuance of a depredation permit. From 2013-2017, WS removed an average of 94 ring-billed gulls annually on JFK property, which represents 0.008% of the North American population.

The removal of 50 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 at JFK:

- Up to **100**

WS' statewide proposed annual removal:

- Up to **200**

Killdeer population statistics:

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

Impacts to killdeer population:

- WS proposed removal at JFK as percent of United States population: **0.01%**
- WS statewide proposed removal as percent of United States population: **0.02%**
- Non-WS authorized removal*: **205**
- Cumulative removal as percent of population: **0.04%**
- 2013-2017 average JFK removal as a percent of the U.S. population: **0.002%**

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

Killdeer are 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. Killdeer are 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).

Killdeer are statewide summer residents of New York and the population trend decline by 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). According to the International Union for Conservation of Nature, killdeer are classified as a *least concern* species (IUCN 2017).

The number of killdeer addressed in New York by all entities to alleviate damage is shown in Table 3.12. According to USFWS data, the highest authorized annual removal over the last five years by non-WS entities was 205 birds. This number in addition to the WS proposed removal values were used to assess the cumulative removal.

Table 3.12 Number of killdeer removed by WS and other entities in New York from FY 2013 - FY 2017.

Year	Removal under Depredation Permits	
	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 the PANYNJ 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 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. From 2013-2017, WS removed an average of 23 killdeer annually on JFK property which represents 0.002% of the U.S. population.

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 at JFK:

- Up to **50**

WS' statewide 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 from 1966-2015: **+0.68%**
- BBS Eastern Region population trend from 1966-2015: **+1.79%**

Impacts to mute swan population:

- WS proposed removal at JFK as percent of New York population: **2.02%**
- WS statewide proposed removal as percent of New York population: **10.1%**
- Non-WS authorized removal*: **6**
- Cumulative removal as percent of population: **10.3%**
- 2013-2017 average JFK removal as a percent of the global population: **0.24%**

*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, there has been an increasing population trend of 0.68% of mute swans in New York from 1966-2015 (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 except with a permit. 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 2019a).

Few entities are allowed to take mute swans in New York as it is prohibited to remove mute swans without a permit. 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 were lethally removed by WS to alleviate damage and 51 were dispersed (released) (Table 3.13).

Table 3.13 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. From 2013-2017, WS removed an average of six mute swans annually on JFK property which represents 0.24% of the statewide population.

Red-tailed Hawk Biology and Population Impacts

WS' proposed annual removal at JFK:

- Up to **30 birds**
- Up to **30 translocated**

WS' statewide proposed annual removal:

- Up to **100 birds**
- Up to **200 translocated**

Red-tailed hawk population statistics:

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

Impacts to red-tailed hawk population:

- WS proposed removal at JFK as percent of New York population: **0.23%**
- WS statewide proposed removal as percent of New York population: **0.77%**
- Non-WS authorized removal*: **127**
- Cumulative removal as percent of population: **1.75%**
- 2013-2017 average JFK removal as a percent of the state population: **0.008%**

*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, recognizable, and numerous 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.

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). The statewide population of red-tailed hawks is approximately 13,000 birds (Partners in Flight 2019). 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 3.14. According to USFWS data, the highest authorized annual removal over the last five years by non-WS entities was 127 birds. This number in addition to the WS proposed removal values used to assess the cumulative removal.

Table 3.14 Number of red-tailed hawks removed and translocated by WS and other entities in New York from FY 2013 - FY 2017.

Year	Removal under Depredation Permits		
	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 the PANYNJ 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 at JFK is only 0.23% of the statewide population and the red-tailed hawk population continues to increase. Therefore, WS' proposed removal will have no significant 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 30 red-tailed hawks at JFK that pose a threat to cause damage. WS' proposed translocation of up to 30 red-tailed hawks is expected to have no significant 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. From 2013-2017, WS removed an average of one red-tailed hawk annually on JFK property which represents 0.008% of the statewide population.

Rock Pigeon Biology and Population Impacts

WS' proposed annual removal at JFK:

- Up to **500**

WS' statewide proposed annual removal:

- Up to **10,000**

Rock pigeon population statistics:

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

Impacts to rock pigeon population:

- WS proposed removal at JFK as percent of New York population: **0.10%**
- WS statewide proposed removal as percent of New York population: **2.00%**
- 2013-2017 average JFK removal as a percent of the state population: **0.07%**

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.

There are an estimated 500,000 rock pigeons in New York State (Partners in Flight 2019). According to BBS observations rock pigeon populations decreased 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, the removal of pigeons can occur without the need for a depredation permit from the USFWS. Because of this, the number of rock pigeons lethally removed by non-WS entities is unknown. 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 3.15.

Table 3.15 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 cooperators' 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 at JFK is of a low magnitude, and therefore will have no significant 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. From 2013-2017, WS removed an average of 329 rock pigeons annually on JFK property which represents 0.07% of the statewide population.

Snowy Egret Biology and Population Impacts

WS' proposed annual removal at JFK:

- Up to **10**

WS' statewide proposed annual removal:

- Up to **40**

Snowy egret population statistics:

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

Impacts to snowy egret population:

- WS proposed removal at JFK as percent of global population: **0.001%**
- WS statewide proposed removal as percent of global population: **0.004%**
- Non-Wildlife Services authorized take*: 1**0**
- Cumulative removal as percent of population: **0.005%**

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

In the late 1800s and early 1900s snowy egrets were hunted for their plumage to meet demands for the millinery trade. 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-NY program has not received requests for assistance associated with snowy egrets in the last 5 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, including JFK.

According to USFWS data, there were no snowy egrets removed in New York by WS or other entities from 2013 to 2017. USFWS data reports that the highest authorized annual removal over the last 5 years by non-WS entities was 10 birds. This number in addition to the WS proposed removal values were 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 10 individuals at JFK would constitute only 0.001% 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. Indeed, there has been no reported removal of snowy egrets on JFK property from 2013-2017.

WS does not expect there to be adverse cumulative impacts on snowy egret populations from WS statewide 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 at JFK:

- Up to **10 birds**
- Up to **10 translocated**

WS' statewide proposed annual removal:

- Up to **30 birds**
- Up to **100 translocated**

Snowy owl population statistics:

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

Impacts to snowy owl population:

- WS proposed removal at JFK as percent of continental population: **0.07%**
- WS proposed removal as percent of continental population: **0.2%**
- Non-WS authorized removal*: **20**
- 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). They are observed in similar open habitats during their winter migrations. During the winter migrations, snowy owls are distributed 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 aircraft strike (Dolbeer et al. 2015). From 1990-2017, there were 259 reported snowy owl strikes with civil aircraft 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 over the past five Christmas Bird Counts ranging from as few as one (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). The continental population for snowy owls is estimated at 15,000 (Partners in Flight 2019).

WS dispersed 11 snowy owls from FY 2013 to FY 2017. Unfortunately, snowy owls often 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 3.16. 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 over the last five years by non-WS entities was 20 birds. This number in addition to the WS proposed removal values were used to assess the cumulative removal.

Table 3.16 Number of snowy owls removed and translocated by WS and other entities in New York from FY 2013 - FY 2017.

Year	Removal under Depredation Permits		
	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 the PANYNJ are reflected as a component of 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 10 snowy owls, and may lethally remove up to 10 snowy owls at JFK 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' JFK proposed removal of up to 10 snowy owls would constitute only 0.07% of the continental population. WS does not expect there to be significant direct, indirect, or cumulative impacts on snowy owl populations based on the proposed removal of 10 individuals.

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.

WS does not expect there to be adverse cumulative impacts on snowy owl populations from WS statewide proposed removal combined with the potential authorized removal from all non-WS entities as it only represents 0.33% of the continental population. The removal of snowy owls can only occur when authorized through the issuance of depredation permits by the USFWS.

Turkey Vulture Biology and Population Impacts

WS' proposed annual removal at JFK:

- Up to **10**

WS' statewide proposed annual removal:

- Up to **750**

Turkey vulture population statistics:

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

Impacts to turkey vulture population:

- WS proposed removal at JFK as percent of New York population: **0.03%**
- WS statewide proposed removal as percent of New York population: **2.50%**
- Non-Wildlife Services authorized take*: **136**
- Cumulative removal as percent of population: **2.95%**

*Highest authorized annual take from 2013-2017 for entities other than Wildlife Services 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 are distributed throughout New York with an estimated population 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, which means it can 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 are listed in Table 3.17. According to USFWS data, the highest authorized annual removal over the last 5 years by non-WS entities was 136 birds. This number in addition to the WS proposed removal values were used to assess the cumulative removal.

Table 3.17 Number of turkey vultures removed by WS and other entities in New York from FY 2013 - FY 2017.

Year	Removal under Depredation Permits	
	WS' Permits[1,2]	Other Entities' Permits[2]
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 the PANYNJ 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 10 individuals at JFK would constitute only 0.03% 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 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. Indeed, there has been no reported removal of turkey vultures on JFK property from 2013-2017.

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)

The PANYNJ implements integrated wildlife hazard management programs at each of its airports, including JFK. These programs are summarized in Wildlife Hazard Management Plans that have been approved by the FAA. As part of these programs, the airports implement various strategies to address

hazards posed by raptors, including not limited to a trap and translocation program. All trapping and translocations are conducted in strict accordance with federal and state permits. Under this protocol all participants will strictly adhere to the following code of ethics (modified from the Bander's Code of Ethics):

- When trapping and handling birds for relocation, minimizing stress and risks of injury (for birds and staff) is a top priority. In the event of injury to staff or birds, the circumstances will be reviewed and this protocol will be reevaluated to ensure that safety concerns are addressed.
- All activities will be continually assessed to ensure the highest possible standards.
- Offer constructive feedback to others to help improve safety, data collection, and trapping and relocation efforts.
- Ensure that data is scientifically accurate (within 95% confidence) and be mindful that this data is use by other researchers to support their scientific findings. The information collected under this protocol is being used in multiple research projects about raptor relocations from airports.
- Operate only within the permitted guidelines and ensure landowner permission at release sites.

Several species within New York that pose threats to aviation safety at JFK can often be managed by capture and translocation. WS may receive requests for the following species: American kestrels, Cooper's hawk, merlins, northern goshawks, northern harriers, peregrine falcons, red-shouldered hawks, red-tailed hawks, rough-legged hawks, sharp-shinned hawks, short-eared owls, and snowy owls. WS would respond to 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 10 of each: merlins, northern goshawks (New York State status-special concern), northern harriers (New York State status-threatened), 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 20 Cooper's hawks (New York State status-special concern), up to 10 snowy owls, up to 30 red-tailed hawks, and up to 60 American kestrels. Table 3.18 shows the number of birds translocated by WS in New York from FY 2013 and FY 2017. Northern goshawks, northern harriers, ospreys, red-shouldered hawks, rough-legged hawks, sharp-shinned hawks, and short-eared owls were not translocated during this time and are therefore not shown in Table 3.18, however they could have been translocated by WS if the opportunity presented itself.

Table 3.18 Number of birds translocated by WS at JFK from FY 2013 to FY 2017

Species	Fiscal Year[1]					**Average**
	2013	2014	2015	2016	2017	
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**
Snowy owl	0	3	3	3	1	**2**
Total translocation	**0**	**5**	**16**	**95**	**178**	

[1]Data reported by federal fiscal year

Lethal removal would only be conducted on species that are not state listed and 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. 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 3.19. Red-shouldered hawks, rough-legged hawks, and short-eared owls were not dispersed during this time and are

therefore not shown in Table 3.19, however they could have been dispersed by WS if the opportunity presented itself. Between FY 2013 and FY 2017, WS lethally removed eight American kestrels and 40 red-tailed hawks. For all other species in this section, WS has conducted only nonlethal management techniques.

Table 3.19 Dispersal numbers by WS at JFK for species listed in Table 3.23 from FY 2013 to FY 2017

Species	Fiscal Year[1]					Average
	2013	2014	2015	2016	2017	
American kestrel	63	72	32	78	195	**88.6**
Cooper's hawk	0	3	2	5	11	**4.2**
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**
Osprey	115	209	188	180	303	**199**
Peregrine falcon	18	37	32	35	45	**33.4**
Red-tailed hawk	81	159	116	91	139	**117.2**
Sharp-shinned hawk	0	1	0	0	4	**1**
Snowy owl	3	3	2	3	0	**2.2**
Total dispersal	**228**	**488**	**381**	**408**	**737**	

[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. Only a portion of the statewide proposed removal would be managed at JFK by WS.

Additional Target Species

Birds

Some target species have been lethally removed in small numbers by WS and have included no more than 20 individuals annually. 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 of each of the following species could be removed annually by WS: American coots, American wigeons, black-crowned night-herons, boat-tailed grackles, Bonaparte's gulls, buffleheads, canvasbacks, cattle egrets, common goldeneye, common loons, gadwalls, greater scaups, green herons,

green-winged teals, horned grebes, 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.

American wigeons, buffleheads, canvasbacks, common goldeneye, 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 would conduct only nonlethal harassment methods to disperse the following species: American golden plovers, American goldfinches, American woodcocks, black-bellied plovers, black terns, Caspian terns, cattle egrets, chimney swifts, chipping sparrows, clapper rails, common terns, dunlins, eastern kingbirds, eastern towhees, Eskimo curlews, field sparrows, Forester'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, semipalmated sandpipers, spotted sandpipers, 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.

For the remainder of the species covered in this section, WS analyzed the removal of barn owls as an indicator of no significant direct or cumulative adverse impacts to any of these species. Barn owls represent the most sensitive species included in this group that WS may lethally remove based on abundance and available habitat in New York State. Although being one of the most widely distributed birds in the world, the barn owl is at its northeastern most range in New York and is considered an uncommon to rare resident in the state (McGowan 2008). WS' removal of up to 10 barn owls represents 0.006% of the continental population. Additionally, according to the the Eastern BBS barn owl populations increased 6.48% between 1966 and 2015. WS therefore does not anticipate any significant adverse impacts to barn owl populations. Furthermore, if barn owls are not adversely impacted by WS' removal, even as such a sensitive species, then no other species in this group should suffer negative impacts to their statewide populations.

Other wildlife on JFK Property

JFK property offers preferred habitat types for a variety of other taxa including mammals, reptiles, and amphibians. This includes but is not limited to rabbits, feral cats, small rodents, diamondback terrapins, snakes, and frogs. All mammals that are managed on JFK property are analyzed under the statewide mammal EA titled: *Mammal Damage Management in the State of New York* (USDA 2018) and are not re-examined in this EA. For other taxa, WS' involvement consists only of preventative technical assistance or nonlethal translocation efforts. For example, WS-New York may help the PANYNJ mark and relocate diamondback terrapins that enter unsafe areas on JFK property. These isolated or infrequent occurrences will be evaluated in a Categorical Exclusion document per APHIS NEPA Implementing Regulations.

Nest Removal for Target Species

The destruction of nests may occur in limited numbers if the nests are inhibiting airport operations or creating an unsafe environment. According to the Migratory Bird Treaty Act, the take of eggs and nests

with eggs is considered lethal take. WS will continue to account for the take/destruction of nests by reporting these numbers annually to USFWS. All proposed nest removal at JFK is shown below in Table 3.20.

Table 3.20 Summary of WS proposed nest removal at JFK of birds analyzed in this EA.

Species	WS Proposed Removal of Nests	Species	WS Proposed Removal of Nests
American black duck	10	House sparrow*	10
American oystercatcher	5	Killdeer	10
Bald eagle	1	Laughing gull	50
Barn swallow	20	Mallard	10
Black-crowned night heron	20	Monk parakeet*	20
Canada goose	100	Mute swan*	50
Double-crested cormorant	50	Osprey	10
European starling*	200	Red-tailed hawk	5
Gadwall	10	Ring-billed gull	50
Great black-backed gull	50	Rock pigeon*	25
Great blue heron	20	Snowy egret	20
Great egret	20	Willet	10
Herring gull	50	Wood duck	10

* Represents an introduced or invasive species.

The destruction of nests by WS would occur in localized areas. Nest destruction would have no 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 the populations of these breeding birds. The removal of nests can only legally occur as authorized by the USFWS and the NYSDEC through the issuance of a depredation permit, and only at levels specified in the permit. This ensures cumulative lethal removal is considered by USFWS as part of population management objectives for these birds.

Summary

Evaluation of WS' activities relative to wildlife populations indicated that bird damage management activities will likely have no cumulative adverse effects on populations around JFK or within 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. 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 - Wildlife Damage Management by WS using only Nonlethal Methods

Under this alternative, WS would not use lethal methods to resolve bird damage problems. Only the nonlethal methods listed in Appendix B would be used to resolve wildlife conflicts in and around JFK. Although some unintentional mortality might result from the use of bird capture devices like mist nets, these incidents are rare and would have negligible impacts on target species populations. JFK and communities in the surrounding area would still be able to obtain permits for lethal bird removal from the USFWS and NYSDEC.

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. Many nonlethal methods are used to exclude, harass, and disperse target wildlife from areas where damage or threats are occurring. When effective, nonlethal methods disperse birds from the area resulting in a reduction in the presence of those birds at the site. 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.

Direct, Indirect, and Cumulative Effects:
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. Depending upon the experience, training, and methods available to the individuals conducting the wildlife damage management, potential adverse direct and indirect impacts on target wildlife populations would likely be the same or less than Alternative 1 (i.e. less experienced individuals may not be able to lethally remove or disperse as many birds as trained WS biologists/technicians). However, for the same reasons shown under Alternative 1, it is unlikely that significant adverse direct or indirect effects would occur to target species by implementation of this alternative. Because WS would be able to provide assistance with nonlethal wildlife damage management, risks of adverse cumulative impacts 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 Wildlife Damage Management Conducted by WS

Under this alternative, WS would not conduct wildlife damage management activities in or around JFK. WS would have no direct involvement with any aspect of addressing damage caused by birds or other wildlife and would provide no technical assistance. No removal of wildlife by WS would occur. Wildlife 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, 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 wildlife populations could decline, stay the same, or increase depending on actions taken by JFK to alleviate 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 wildlife would likely still be removed under this alternative, the potential direct, indirect, and cumulative effects on the populations of those species would be similar among all the alternatives for this issue. However without WS' expertise in guiding individual efforts the risk of direct, indirect, or cumulative impacts have the potential to be greater under this alternative.

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

A concern is often raised about the potential impacts to nontarget species, including T&E species, from the use of methods to resolve damage caused by wildlife. The potential effects on the populations of nontarget wildlife species, including T&E species, are analyzed below.

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

The potential adverse effects to nontarget plant and wildlife species occurs from the employment of methods to address wildlife damage at JFK. Under the proposed action, WS could provide both technical assistance and direct operational assistance to JFK personnel. WS personnel are experienced and trained in wildlife identification and to select the most appropriate methods for taking targeted animals and excluding nontarget species. To reduce the likelihood of capturing nontarget wildlife, WS would employ mostly selective methods for target wildlife, and determine placement of methods to avoid exposure to nontarget animals. Standard operating procedures to prevent and reduce any potential adverse impacts on nontarget wildlife are discussed in Chapter 2 of this EA. Despite the best efforts to minimize removal of nontarget 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 nontarget species to ensure management activities or methodologies used in wildlife damage management do not create direct effects on nontarget populations. WS would report this annually to the USFWS and/or the NYSDEC to ensure removal by WS is not creating a significant impact on these populations.

Direct, Indirect, and Cumulative Effects:
While every precaution is taken to safeguard against taking nontarget 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 nontarget species at JFK is expected to be extremely low to non-existent.

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 wildlife damage employed by trained, knowledgeable personnel are highly selective for target wildlife species. WS would annually report to the USFWS and/or the NYSDEC any nontarget removal to ensure removal by WS is considered as part of management objectives. Additionally, WS would work with the USFWS to identify and implement conservation measures to minimize to the greatest extent the possibility of impacting federally listed threatened and endangered species. The potential impacts to nontarget or threatened and endangered plants and wildlife are similar to the other alternatives and are considered to be minimal to nonexistent. 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 or around JFK. 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 nontarget wildlife primarily through exclusion, harassment, and dispersal. The use of auditory and visual dispersal methods used to reduce damage or threats caused by wildlife are also likely to disperse nontargets in the immediate area the methods are employed. Therefore, nontargets may be dispersed from an area while employing nonlethal dispersal techniques. However, like target species, the potential direct impacts on nontarget species are expected to be temporary with target and nontarget 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 nontarget species may occur, but these are expected to be minimal. The use of nonlethal methods would not have significant adverse impacts on nontarget 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 nontarget 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 nontargets. Traps and nets are attended regularly, therefore any nontargets captured can generally be released on site unharmed. Therefore, no direct effects are expected on nontargets.

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 nontarget species when used according to label requirements. Most repellents for birds are derived from natural ingredients that pose a very low risk to nontargets 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 nontargets 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 nontargets would be anticipated from use of this method. The euthanasia of wildlife by WS' personnel would be conducted in accordance with WS Directive 2.505. Euthanasia would follow AVMA guidelines, whenever practicable. WS' recommendation that wildlife be harvested during the regulated season by private entities to alleviate damage would not increase risks to nontargets.

During the migration period, eagles occur throughout the United States and parts of Mexico (Buehler 2000). Under the Bald and Golden Eagle Act, activities that could result in the "take" of eagles cannot occur unless the USFWS allow 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 and nonpurposeful 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 in or around JFK 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 nesting in a given area. For instance, if eagles build a nest near your existing home, cabin, or place of business you do not need a permit" (USFWS 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). 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 nontargets. WS uses a variety of methods to maximize the uptake of treated bait by target species and to prevent nontarget species from ingesting the treated bait. All label requirements of DRC-1339 would be followed to minimize nontarget hazards. As required by the label, all potential bait sites are prebaited and monitored for nontarget use as outlined in the pre-treatment observations section of the label. WS does not apply treated baits to location where prebait 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 nontargets finding and consuming bait that has been treated. The bait type selected can also limit the likelihood that nontarget species would consume treated bait since some bait types are not preferred by nontarget 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 nontargets. In addition, many bird species when present in large numbers tend to exclude nontargets 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 finished feeding would be removed to avoid attracting nontargets. Beginning one day after bait

application, the applicator or land manager will search treated areas and immediate surrounding areas to collect dying birds and carcasses, and bury or burn them according to state laws.

Summary

WS does not anticipate any adverse cumulative impacts on nontarget species from the implementation of the proposed wildlife damage management methods. It is possible that reductions in the number of non-native mute swans and resident Canada geese, as outline by Alternative 1, could actually have beneficial impacts on nontarget species in areas near JFK, such as Gateway NRA. Based on the methods available to resolve wildlife damage and/or threats, WS does not anticipate the number of nontargets removed to reach a magnitude where declines in those species' populations would occur. Therefore, removal under the proposed action of nontargets will not create adverse cumulative effects on nontarget 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, 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.

T&E Species Effects

Special efforts are made to avoid jeopardizing T&E species through biological evaluations of the potential effects and the establishment of special restrictions or minimization measures. SOPs to avoid T&E effects are described in Chapter 2 of this EA.

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

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 - Wildlife Damage Management by WS using only Nonlethal Methods

Under this alternative, risks to nontarget species from WS actions would likely be limited to the use of frightening devices, exclusionary devices, and the risks of unintentional capture of an animal in a live-capture device as outlined under Alternative 1. Although the availability of WS assistance with nonlethal wildlife damage management methods could decrease incentives for non-WS entities to use lethal wildlife damage management methods, non-WS efforts to reduce or prevent damage could result in less experienced persons implementing wildlife damage management methods, creating more opportunity for removal of nontarget 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 nontarget 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 nontarget 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 nontargets from nonlethal methods of wildlife 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 nontarget 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 nuisance wildlife species to T&E species would be variable based upon the skills and abilities of the person implementing wildlife damage management techniques. While cumulative impacts would be variable, WS does not anticipate any significant cumulative impacts from this alternative.

Alternative 3 - No Wildlife Damage Management Conducted by WS

Under this alternative, WS would not be directly involved with damage management activities, but wildlife could continue to be removed by individuals or agencies other than WS under depredation permits issued by the USFWS and the NYSDEC; 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 nontargets and T&E species would continue to occur from those who implement wildlife 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 wildlife 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 nontargets or T&E species would occur by WS under this alternative. The ability to reduce damage and threats of damage caused by nuisance wildlife to T&E species would be variable based upon the skills and abilities of the individuals implementing damage management actions under this alternative. The risks to nontargets 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 nontargets would be minimal to non-existent. If methods available were applied incorrectly or applied without knowledge of wildlife behavior, risks to nontarget wildlife would be higher under this alternative. Therefore, adverse direct, indirect, or cumulative impacts to nontargets, 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 Wildlife Damage (Proposed Action/No Action)

JFK is made aware through a cooperative service agreement of the methods that could potentially be used on property owned or managed by the JFK to allow them 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 to 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, nest and egg treatments, and snap traps. Avicide DRC-1339 is currently restricted to use by WS only.

WS' employees 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 wildlife. Prior to and during the utilization of lethal methods, WS' employees would consider risks to human safety based on location and method. 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 occurred on private property where access to the property is controlled and monitored, the risks to human safety from the use of methods would likely be lower. If damage management activities occurred at parks or near other public use areas, then risks of the public encountering damage management methods and the corresponding risk to human safety would be higher. These activities would generally be conducted when human activity is minimal (e.g., early mornings, at night). Access to JFK property is restricted which would also minimize the risk to human safety.

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 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.

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. Wildlife 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.

Traps primarily used on JFK property would have minimal potential for human contact, and these traps would 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 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 since application occurs directly to target species by trained personnel.

The recommendation of repellents or the use of those repellents registered for use to disperse wildlife could occur under the proposed action as part of an integrated approach to managing wildlife damage at JFK. 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 or the direct use of repellents, would ensure that label requirements of those repellents are discussed with JFK personnel 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 wildlife 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 nontarget use of the area (areas with nontarget activity are not used or abandoned), and based on human safety. Once appropriate locations are 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. Locations would be monitored for nontarget activity and to ensure the safety of nearby personnel. After each baiting session, all uneaten bait would be retrieved. The pre-baiting period allows treated bait to be placed at a location only when target wildlife 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. 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 JFK would be minimal to ensure human safety. No adverse indirect effects are anticipated from the application of any of the chemicals available for WS.

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

Under this alternative, WS would not use lethal wildlife damage management methods. However, Avitrol products would be available to licensed pesticide applicators under this alternative. Air travel safety for the public from WS wildlife damage management activities will depend on the ability of WS to resolve problems using nonlethal methods and the effectiveness of non-WS wildlife damage management efforts. In situations where risks to human health and safety from wildlife cannot be resolved using nonlethal methods, safety for the public will depend on the efficacy of non-WS use of lethal wildlife damage management methods. If lethal wildlife damage management 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:
The use of nonlethal methods under Alternative 2 would be the same as discussed under Alternative 1. However, non-WS efforts to reduce or prevent damage using lethal methods 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. If no other entity uses lethal methods on JFK property, risks from those methods would obviously be reduced. However, safety risks to air travelers could increase if wildlife threats cannot be adequately addressed using only nonlethal methods. 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 this chemical. Overall, safety risks are expected to be higher than Alternative 1 due to the lack of ability to reduce wildlife strikes.

Alternative 3-No Wildlife Damage Management Conducted by WS

Under the no wildlife damage management alternative, WS would not be involved with any aspect of managing damage associated with wildlife at JFK, including technical assistance. Due to the lack of involvement in managing damage caused by wildlife, no impacts to human safety would occur directly from WS. This alternative would not prevent JFK 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 wildlife if permitted by the USFWS and/or the NYSDEC. The direct burden of implementing permitted methods would be placed on JFK and the PANYNJ.

Direct, Indirect, and Cumulative Effects:
Risks of wildlife damage management methods by non-WS entities would be variable and unpredictable depending on their experience level. If no other entity managed wildlife on JFK property, risks would be reduced. However, safety risks to air travelers would likely increase if wildlife threats were not adequately addressed. 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 this chemical. Overall, safety risks are expected to be higher than Alternatives 1 and 2 due to the lack of ability to reduce wildlife strikes.

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 Wildlife 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 groups of birds to resolve damage and threats. All bird damage management activities are conducted at the request of the PANYNJ and JFK and such management services have been agreed upon in a CSA. Access on JFK is restricted, and therefore viewing wildlife on airport property is unavailable. It is feasible that wildlife viewers will have greater chances to observe birds outside of JFK property when birds are dispersed off of the property.

The aesthetic value of viewing Canada geese for outdoor enthusiasts will not be diminished in response to the lethal removal of Canada geese in or around JFK. The goal of this management practice is not to eliminate all geese from the area, but rather reduce the local resident population to numbers that are safer for air traffic in and around JFK. WS does not, and often cannot remove all geese that are observed during surveys. For example, an average of 674 geese were observed during quarterly surveys conducted at 8 NYC-owned properties in FY17, leading up to a removal of 346 geese at these same locations in late June (USDA 2018*b*). Post-removal surveys conducted in FY18 revealed an average of 456 geese observed at these same eight properties. Some Canada geese remained and new individuals likely immigrated to these eight properties even after the removal event by WS. Therefore, recreationalists will still have ample opportunities to view geese in their natural environment in the NYC area.

WS' proposal to reduce bird damage through an integrated approach using a combination of nonlethal and lethal methods is not expected to interfere with waterfowl hunting near JFK. Birds that are of management concern at JFK are typically 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, or without the need for a permit (non-native species), 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' wildlife 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. Removal of resident Canada geese within Gateway NRA has a temporary seasonal impact on the visitor experience within the Jamaica Bay Wildlife Refuge, in areas of the park that is managed primarily for wildlife and wildlife observation. Additionally, WS involvement could lead to the return of additional native bird species that otherwise would not be there, especially in off-airport properties such as city/state parks or National Park lands, which could increase the enjoyment of viewing the birds. Continued increases in numbers of birds causing damage may decrease some people's enjoyment of any wildlife or the natural environment. The actions of WS would positively affect the aesthetic enjoyment of wildlife for local residents by creating a safer flying environment by lessening the threat of wildlife strikes.

These same management actions are not likely to affect waterfowl hunting opportunities because JFK is not accessible to hunters. Therefore, hunters 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 JFK personnel 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 the PANYNJ. 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 - Wildlife Damage Management by WS using only Nonlethal Methods

Under this alternative, WS would not conduct any lethal wildlife damage management, but may conduct harassment of wildlife that are causing damage. Other nonlethal methods may be conducted as well under this alternative to help alleviate damage caused by wildlife. Wildlife would be dispersed or excluded from some parts of the airport; however, complete exclusion using only nonlethal methods is highly unlikely.

Direct, Indirect, and Cumulative Effects:
Although WS would not perform any lethal activities under this alternative, other private entities would likely conduct lethal wildlife damage management activities, which means the direct and indirect effects would then be similar to the Proposed Action Alternative 1. Without the reinforcement of lethal methods, there could be an increase in the use of harassment methods such as pyrotechnics. This could result in an increase in the noise disturbances associated with pyrotechnics, but not to a significant level. Cumulative impacts are expected to be similar to Alternative 1.

Alternative 3 - No Wildlife Damage Management Conducted by WS

Under the no wildlife damage management by WS alternative, the actions of WS would have no impact on the aesthetic value of birds. The PANYNJ would be responsible for researching, obtaining, and using all methods as permitted by federal, state, and local laws and regulations to alleviate such damage. 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. Wildlife could still be dispersed or removed under this alternative by the PANYNJ. Removal could also occur 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 the PANYNJ 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 wildlife could continue to be removed under this alternative despite WS' lack of involvement, the ability to view and enjoy wildlife 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 cooperating agencies; 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 Factors Previously Considered in the SEIS

The scope of work by WS in and around JFK has substantially changed in the years following the SEIS. Issues that were previously analyzed in the SEIS are no longer substantial because none of the alternatives outlined in this EA have caused or are predicted to cause any significant impact on these issues. Wildlife habitat and water quality were ecological resources in the SEIS that were considered. These resources are not being considered in this EA as no alternative will cause any significant ground disturbance or large scale habitat alteration.

WS' impact on ambient noise was also considered in the SEIS. Harassment is used to reduce bird presence in and around JFK. Relative to ambient noise generated by JFK, the risk of disturbance from on-airport use of harassment is minimal and will unlikely significantly disturb any nontarget birds within the vicinity.

WS' effects on air quality would be from minor impacts associated with pyrotechnics, shooting for deterrence or lethal purposes, and exhaust from vehicles used for patrols on and off airport sites. However, against background air quality conditions, these impacts are not substantial enough to warrant extensive analysis.

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 wildlife species or groups of species 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. Therefore, damage management activities conducted pursuant to any of the alternatives would not adversely affect biodiversity.

Effects on Hunting

WS' waterfowl damage management activities would primarily be conducted on populations where hunting access is restricted (e.g., JFK airfield, urban and suburban areas) or has been ineffective (e.g., urban and suburban areas). In these areas, waterfowl survival rates are high due to the lack of natural predators and limited exposure to hunting, and therefore management activities and vehicle collisions are the most common cause of mortality (Conover 1998). The use of some management methods may even

disperse birds from localized areas where damage is occurring to areas outside the damage area, which could serve to move them from those less accessible areas to places accessible to legal hunters.

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 his or her 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) or the recommendations of a veterinarian, whenever practicable. 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 National Wildlife Research Center 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 such as those in and around JFK.

Wildlife 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. Activities conducted for the management of damage and threats to human safety from wildlife at JFK would be funded through a cooperative service agreement with the PANYNJ. A minimal federal appropriation is allotted for the maintenance of a WS program in New York. The remainder of the WS program is entirely fee-based. 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.

Cost Effectiveness of Management Methods

The CEQ does not require a formal, monetized cost benefit analysis (including socioeconomic impacts) 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 wildlife 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 wildlife are causing damage or pose a threat. Additionally, management operations may be constrained by cooperator funding and/or objectives and needs.

Wildlife Damage Should be Managed by Private Nuisance Wildlife Control Agents

Private nuisance wildlife control agents could be contacted to reduce wildlife 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, 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 wildlife. As described in Appendix B, the lethal removal of wildlife 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 with 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 the animal, if misses occur, or if the 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%) (EPA 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 and American Fisheries 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 and American Fisheries 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 (EPA 2013). Since the harvest of wildlife 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 wildlife would not be additive to the environmental status quo. WS' assistance would not be additive to the environmental status quo since those animals 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 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 wildlife is 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 carcasses lethally removed using firearms would be retrieved and disposed of properly to limit the availability of lead in the environment and ensures the 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 carcasses that may be irretrievable would be below any level that would pose any risk from exposure or significant contamination of water.

3.3 SUMMARY OF IMPACTS

No significant cumulative environmental impacts are expected from any of the proposed actions analyzed in this EA. Under the Current/Proposed Action, the lethal removal of wildlife by WS on JFK property has not and would not have a significant impact on overall wildlife 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 wildlife damage management activities. Although some persons will likely be opposed to WS' participation in wildlife damage management activities on behalf of the PANYNJ, the analysis in this EA indicates that WS integrated wildlife 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

4.1 LIST OF PREPARERS

Daniel R. Inserillo: USDA-APHIS-WS, Staff Wildlife Biologist, Rensselaer, NY
Kimberly Porter: USDA-APHIS-WS, Staff Wildlife Biologist, Rensselaer, NY
Christopher K. Croson: USDA-APHIS-WS, Environmental Management Coordinator, Mooresville, NC
Allen L. Gosser: USDA-APHIS-WS, State Director, Rensselaer, NY
William Wilmoth: USDA-APHIS-WS, Assistant State Director, Rensselaer, NY
Andrew Clapper: USDA-APHIS-WS, District Supervisor, Springfield Gardens, NY
Thomas Desisto: USDA-APHIS-WS, Assistant District Supervisor, Springfield Gardens, NY
Melissa Malloy: USDA-APHIS-WS, Wildlife Biologists, Jamaica, NY
James Micalizzi: USDA-APHIS-WS, Biological Science Technician, Jamaica, NY

4.2 LIST OF PERSONS/AGENCIES CONSULTED

United States Department of the Interior, Fish and Wildlife Service
United States Department of the Interior, National Park Service
New York State Department of Environmental Conservation
The Port Authority of New York and New Jersey
New York City Department of Environmental Protection

APPENDIX A: LITERATURE CITED

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APPENDIX B: METHODS AVAILABLE for RESOLVING or PREVENTING WILDLIFE DAMAGE in or around JFK INTERNATIONAL AIRPORT

NONLETHAL METHODS – NON-CHEMICAL

Environmental/Habitat modification can be an integral part of wildlife 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 larger bodied birds such as 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., JFK airfield), however it can be practical in small areas (e.g., personal gardens) (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.

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, birds 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 JFK property 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 can sometimes be used to mitigate the loss potential when damage cannot be avoided by careful crop selection or modified planting schedules. 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 LD50 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 Schafer 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 (MA) 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 (LD50 > 25 micrograms/bee), nontoxic to rats in an inhalation study (LC50 > 2.8 mg/L), 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 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. 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.

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.

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 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 geese 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 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, 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 nontarget 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 nontarget 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 Canada goose or cormorant eggs.

APPENDIX C: FEDERALLY LISTED THREATENED and ENDANGERED SPECIES and CONSULTATION

Species	Counties	Habitat Characteristics	Relevant Information	Methods for Resolving Damage and Their Effects on Species	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.	• Bog turtles do not occur in Queens County, NY where JFK is located, therefore wildlife management effects on bog turtles is discountable.	• Technical assistance, **No effect** (*i.e., recommendation of 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 repellants, **No effect** • Live traps, **No effect** • Live capture & 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.	• Indiana bats do not occur in Queens County, NY where JFK is located, therefore wildlife management effects on bog turtles is discountable.	• Technical assistance, **No effect** (*i.e., recommendation of hunting, physical exclusion, habitat modification*) • Paintball guns, **No effect** • Bird barriers, **No effect** • Audio scaring, **May affect, not likely to adversely affect** • Visual scaring, **No effect** • Lasers, **No effect** • Chemical repellants, **No effect** • Live traps, **No effect** • Live capture & euthanasia, **No effect** • Lethal traps, **No effect** • Shooting, (noise) **May affect, not likely to adversely affect** • Lethal chemicals, **No effect** • Nest/egg destruction, **No effect**	• **No effect**
Karner blue butterfly (E) *Lycaeides melissa samuelis*	Albany, Saratoga, Schenectady, Warren	• Dependent on wild blue lupine, in upland savanna and barrens habitats typified by dry sandy soils, pitch pine or dune/sand plain plant communities; and now occur in roadsides, military bases, and some forest lands.	• Karner blue butterflies do not occur in Queens County, NY where JFK is located, therefore wildlife management effects on Karner blue butterflies are discountable.	• Technical assistance, **No effect** (*i.e., recommendation of 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 repellants, **No effect**	• **No effect**

APPENDIX C: FEDERALLY LISTED THREATENED and ENDANGERED SPECIES and CONSULTATION

Species	Counties	Habitat Characteristics	Relevant Information	Methods for Resolving Damage and Their Effects on Species	Overall Determination
				• Live traps, **No effect** • Live capture & euthanasia, **No effect** • Lethal traps, **No effect** • Shooting, **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.	• Clubshell mussels do not occur in Queens County, NY where JFK is located, therefore wildlife management effects on clubshell mussels are discountable.	• Technical assistance, **No effect** (*i.e., recommendation of 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 repellants, **No effect** • Live traps, **No effect** • Live capture & 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.	• Rayed beans do not occur in Queens County, NY where JFK is located, therefore wildlife management effects on rayed beans are discountable.	• Technical assistance, **No effect** (*i.e., recommendation of 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 repellants, **No effect** • Live traps, **No effect** • Live capture & euthanasia, **No effect** • Lethal traps, **No effect** • Shooting, **No effect** • Lethal chemicals, **No effect** • Nest/egg destruction, **No effect**	• **No effect**
Houghton's goldenrod (T)	Genesee	• Grows only along the Great Lakes shoreline. It grows primarily along the northern	• Houghton's goldenrod does not occur in Queens County, NY where JFK is located, therefore wildlife management effects on Houghton's goldenrod is discountable.	• Technical assistance, **No effect** (*i.e., recommendation of hunting, physical exclusion, habitat modification*) • Paintball guns, **No effect**	• **No effect**

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Species	Counties	Habitat Characteristics	Relevant Information	Methods for Resolving Damage and Their Effects on Species	Overall Determination
Solidago houghtonii		shores of Lakes Michigan and Huron. • Typically grows on moist sandy beaches and shallow depressions between low sand ridges along the shoreline. Fluctuating water levels of the Great Lakes play a role in maintaining this unique goldenrod.		• Bird barriers, **No effect** • Audio scaring, **No effect** • Visual scaring, **No effect** • Lasers, **No effect** • Chemical repellants, **No effect** • Live traps, **No effect** • Live capture & euthanasia, **No effect** • Lethal traps, **No effect** • Shooting, **No effect** • Lethal chemicals, **No effect** • Nest/egg destruction, **No effect**	
Northern wild monkshood (T) *Aconitum noveboracense*	Delaware, Sullivan, Ulster	• This plant is typically found on shaded or partly shaded cliffs, algific talus slopes, or on cool, streamside sites. These areas have cool soil conditions, cold air drainage, or cold groundwater flowage. This plant has distinct blue hood-shaped flowers. Stems range about 1-4 ft. tall. Habitat consists of sand, firm muddy sand, firm clay, and/or gravel bottom in creeks and rivers of various sizes.	• Northern wild monkshood does not occur in Queens County, NY where JFK is located, therefore wildlife management effects on northern wild monkshood are discountable.	• Technical assistance, **No effect** (*i.e., recommendation of 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 repellants, **No effect** • Live traps, **No effect** • Live capture & 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 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.	• Dwarf wedgemussels do not occur in Queens County, NY where JFK is located, therefore wildlife management effects on dwarf wedgemussels are discountable.	• Technical assistance, **No effect** (*i.e., recommendation of 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 repellants, **No effect** • Live traps, **No effect** • Live capture & euthanasia, **No effect** • Lethal traps, **No effect** • Shooting, **No effect** • Lethal chemicals, **No effect** • Nest/egg destruction, **No effect**	• **No effect**

APPENDIX C: FEDERALLY LISTED THREATENED and ENDANGERED SPECIES and CONSULTATION

Species	Counties	Habitat Characteristics	Relevant Information	Methods for Resolving Damage and Their Effects on Species	Overall Determination
Eastern prairie fringed orchid (T) (Historic) *Plantanthera leucophaea*	This plant is considered extirpated in New York.	• This plant is found in habitats ranging from mesic prairie to wetlands such as sedge meadows, marsh edges and bogs. • Requires full sun and grassy habitat with little or no woody encroachments.	• This plant is considered extirpated in New York.	• Technical assistance, **No effect** (*i.e., recommendation of 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 repellants, **No effect** • Live traps, **No effect** • Live capture & euthanasia, **No effect** • Lethal traps, **No effect** • Shooting, **No effect** • Lethal chemicals, **No effect** • Nest/egg destruction, **No effect**	• **No effect**

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Species	Counties	Habitat Characteristics	Relevant Information	Methods for Resolving Damage and Their Effects on Species	Overall Determination
Roseate tern (E) *Sterna dougallii*	Suffolk	• Nests can be small depressions in the sand, shell, or gravel, and may be lined with bits of grass and other debris. Nests are usually placed in dense grass clumps, or even under boulders or riprap. • Forages in near-shore waters. • Uses a variety of substrates, including pea gravel, open sand, overhanging rocks, and salt marshes.	• 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 terns. • Terns may fly over JFK airspace and be impacted by noise produced during management activities.	• Technical assistance, **No effect** (*i.e., recommendation of 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 repellants, **No effect** • Live traps, **No effect** • Live capture & 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**
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 identification and are aware of locations where this species breeds. • Management activities are not expected to occur in habitats occupied by Piping Plover. Wildlife Services will coordinate with U.S. Fish and Wildlife Service Long Island Field Office for any projects anticipated to impact this species or their habitat prior to implementation. • Wildlife Services will consult USFWS IPaC and/or the NYSDEC mapper to identify locations of plovers. • If management does occur in plover habitat, driving should not take place near potential breeding sites. If driving does occur it should follow the guidelines in Appendix G of the revised piping plover recovery plan.	• Technical assistance, **No effect** (*i.e., recommendation of 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 repellants, **No effect** • Live traps, **No effect** • Live capture & 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)	Madison, Onondaga	• This plant is found in a few discrete habitats in shaded, moist, northern deciduous forests growing in fissures in large rocks	• American hart's tongue fern does not occur in Queens County, NY where JFK is located, therefore wildlife management effects on American hart's tongue fern are discountable.	• Technical assistance, **No effect** (*i.e., recommendation of hunting, physical exclusion, habitat modification*) • Paintball guns, **No effect**	• **No effect**

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Species	Counties	Habitat Characteristics	Relevant Information	Methods for Resolving Damage and Their Effects on Species	Overall Determination
Asplenium scolopendrium var. americana		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.		• Bird barriers, **No effect** • Audio scaring, **No effect** • Visual scaring, **No effect** • Lasers, **No effect** • Chemical repellants, **No effect** • Live traps, **No effect** • Live capture & euthanasia, **No effect** • Lethal traps, **No effect** • Shooting, **No effect** • Lethal chemicals, **No effect** • Nest/egg destruction, **No effect**	
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. • Chittenango ovate amber snail does not occur in Queens County, NY where JFK is located, therefore wildlife management effects on Chittenango ovate amber snail are discountable.	• Technical assistance, **No effect** (*i.e., recommendation of 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 repellants, **No effect** • Live traps, **No effect** • Live capture & 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. • Management activities for Canada geese on behalf of JFK could occur on and around sand beaches and dunes. • Wildlife Services will consult USFWS IPaC and/or the NYSDEC mapper 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	• Technical assistance, **No effect** (*i.e., recommendation of 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 repellants, **No effect** • Live traps, No effect • Live capture & euthanasia, **No effect** • Lethal traps, **No effect** • Shooting, **No effect**	• **No effect**

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Species	Counties	Habitat Characteristics	Relevant Information	Methods for Resolving Damage and Their Effects on Species	Overall Determination
			symbolic fencing with 10' diameter spacing around individual plants or plant colonies.	• Lethal chemicals, **No effect** • Nest/egg destruction, **No effect**	
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.	• Small whorled pogonia does not occur in Queens County, NY where JFK is located, therefore wildlife management effects on small whorled pogonia are discountable.	• Technical assistance, **No effect** (*i.e., recommendation of 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 repellants, **No effect** • Live traps, **No effect** • Live capture & euthanasia, **No effect** • Lethal traps, **No effect** • Shooting, **No effect** • Lethal chemicals, **No effect** • Nest/egg destruction, **No effect**	• **No effect**

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Species	Counties	Habitat Characteristics	Relevant Information	Methods for Resolving Damage and Their Effects on Species	Overall Determination
Seabeach amaranth (T) *Amaranthus pumilus*	Nassau, Suffolk, Queens	• Plants are found along the coastline where it grows on the shifting sands between the dunes and the high tide mark.	• Occurrences of working in these habitats would be unlikely and therefore impacts would be discountable. • Management activities for Canada geese on behalf of JFK could occur on and around sand beaches and dunes. • Wildlife Services will consult USFWS IPaC and/or the NYSDEC mapper 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' diameter spacing around individual plants or plant colonies.	• Technical assistance, **No effect** (*i.e., recommendation of 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 repellants, **No effect** • Live traps, • Live capture & 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. • Leedy's roseroot does not occur in Queens County, NY where JFK is located, therefore wildlife management effects Leedy's roseroot are discountable.	• Technical assistance, **No effect** (*i.e., recommendation of 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 repellants, **No effect** • Live traps, **No effect** • Live capture & euthanasia, **No effect** • Lethal traps, **No effect** • Shooting, **No effect** • Lethal chemicals, **No effect** • Nest/egg destruction, **No effect**	• **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.	• Northeastern bulrush does not occur in Queens County, NY where JFK is located, therefore wildlife management effects on northeastern bulrush are discountable.	• Technical assistance, **No effect** (*i.e., recommendation of 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 repellants, **No effect**	• **No effect**

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Species	Counties	Habitat Characteristics	Relevant Information	Methods for Resolving Damage and Their Effects on Species	Overall Determination
				• Live traps, **No effect** • Live capture & euthanasia, **No effect** • Lethal traps, **No effect** • Shooting, **No effect** • Lethal chemicals, **No effect** • Nest/egg destruction, **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 are not expected to occur in habitats occupied by Kemp's ridley sea turtle. • 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 of 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 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 repellants, **No effect** • Live traps, **No effect** • Live capture & euthanasia, **No effect** • Lethal traps, **No effect** • Shooting, **No effect** • Lethal chemicals, **No effect** • Nest/egg destruction, **No effect**	• **May affect, but not likely to adversely affect**
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.	• Green sea turtle does not occur in Queens County, NY where JFK is located, therefore wildlife management effects on green sea turtle are discountable.	• Technical assistance, **No effect** (*i.e., recommendation of 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 repellants, **No effect** • Live traps, **No effect** • Live capture & 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 JFK are not expected to occur in habitats used by hawksbill sea turtle.	• Technical assistance, **No effect** (*i.e., recommendation of hunting, physical exclusion, habitat modification*) • Paintball guns, **No effect** • Bird barriers, **No effect**	• **No effect**

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Species	Counties	Habitat Characteristics	Relevant Information	Methods for Resolving Damage and Their Effects on Species	Overall Determination
				• Audio scaring, **No effect** • Visual scaring, **No effect** • Lasers, **No effect** • Chemical repellants, **No effect** • Live traps, **No effect** • Live capture & 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.	• Loggerhead sea turtle does not occur in Queens County, NY where JFK is located, therefore wildlife management effects on loggerhead sea turtle are discountable.	• Technical assistance, **No effect** (*i.e., recommendation of 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 repellants, **No effect** • Live traps, **No effect** • Live capture & euthanasia, **No effect** • Lethal traps, **No effect** • Shooting, **No effect** • Lethal chemicals, **No effect** • Nest/egg destruction, **No effect**	• **No effect**

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Leatherback sea turtle (E) *Dermochelys coriacea*	Kings, Nassau, Queens, Richmond, Suffolk	• Primarily open ocean, but does forage in coastal waters.	• Management activities for JFK are not expected to occur in habitat used by leatherback sea turtles.	• Technical assistance, **No effect** (*i.e., recommendation of 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 repellants, **No effect** • Live traps, **No effect** • Live capture & euthanasia, **No effect** • Lethal traps, **No effect** • Shooting, **No effect** • Lethal chemicals, **No effect** • Nest/egg destruction, **No effect**	• **No effect**

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Species	Counties	Habitat Characteristics	Relevant Information	Methods for Resolving Damage and Their Effects on Species	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 wildlife 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 hunting, physical exclusion, habitat modification*) • 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 repellants, **No effect** • Live traps, **No effect** • Live capture & 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**
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 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 repellants, **No effect** • Live traps, **No effect** • Live capture & euthanasia, **No effect** • Lethal traps, **No effect** • Shooting, (noise) **May affect** • Lethal chemicals, **No effect**	• **May affect, but not likely to adversely affect**

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				• Nest/egg destruction, **No effect**	
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 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 repellants, **No effect** • Live traps, **No effect** • Live capture & euthanasia, **No effect** • Lethal traps, **No effect** • Shooting, **No effect** • Lethal chemicals, **No effect** • Nest/egg destruction, **No effect**	• **No effect**
Rusty patched bumble bee (E) (historic) *Bombus affinis*	Currently not believed to occur in New York	• Grasslands and prairies with undisturbed soils.	• This species is not currently believed to occur in New York so no impacts are expected.	• Technical assistance, **No effect** (*i.e., recommendation of 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 repellants, **No effect** • Live traps, **No effect** • Live capture & 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.	• Eastern massasaugas do not occur in Queens County, NY where JFK is located, therefore wildlife management effects on eastern massasauga are discountable.	• Technical assistance, **No effect** (*i.e., recommendation of hunting, physical exclusion, habitat modification*) • Paintball guns, **No effect** • Bird barriers, **No effect** • Audio scaring, **No effect** • Visual scaring, **No effect** • Lasers, **No effect**	• **No effect**

APPENDIX C: FEDERALLY LISTED THREATENED and ENDANGERED SPECIES and CONSULTATION

Species	Counties	Habitat Characteristics	Relevant Information	Methods for Resolving Damage and Their Effects on Species	Overall Determination
				• Chemical repellants, **No effect** • Live traps, **No effect** • Live capture & euthanasia, **No effect** • Lethal traps, **No effect** • Shooting, **No effect** • Lethal chemicals, **No effect** • Nest/egg destruction, **No effect**	

APPENDIX C: FEDERALLY LISTED THREATENED and ENDANGERED SPECIES and CONSULTATION

United States Department of the Interior

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

May 3, 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 (USDA), Animal and Plant Health Inspection Service (APHIS), Wildlife Services' request for consultation pursuant to the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.) on the USDA's "Wildlife Hazard Reduction Program: John F. Kennedy International Airport" (Program).

The APHIS has reached determinations regarding the potential effects of the Program on the following species:

1) **Species Which Will Not ·Be Impacted by the Proposed Action:**

Leatherback sea turtle *(Dermochelys coriacea)* - endangered
Sandplain gerardia *(Agalinis acuta)* - endangered
Seabeach amaranth *(Amaranthus pumilus)* - threatened
Eastern prairie fringed orchid *(Platanthera leucophaea)* - threatened (historic)
Rusty patched bumble bee *(Bombus afjinis)*- endangered (historic)
Swamp pink *(Helonias bullata)*- threatened (historic)

2) **Species Which May Be Affected But Which Are Not Likely to Be Adversely: Affected.**

Kemp's [Atlantic] Ridley sea turtle *(Lepidochelys kempi)* - endangered
Northern long-eared bat *(Myotis septentrionalis)* - threatened
Piping plover (*Charadrius melodus)-Atlantic* coast breeding population: threatened
Red knot (*Calidris canutus rufa)* - threatened
Roseate tern *(Sterna dougallii dougallii)* - endangered

APPENDIX C: FEDERALLY LISTED THREATENED and ENDANGERED SPECIES and CONSULTATION with USFWS

U.S. Fish and Wildlife Service (Service) Comments

The Service acknowledges the USDA's no effect determination for the species noted above and concurs with the USDA's detem1ination that the proposed project would not be likely to adversely affect the species noted above provided the following conditions are incorporated into the project description:

1) Coordination with the landowner concerning the location of any listed species; and
2) Further consultation with the Service is undertaken when a specific project is unde1 1aken within or adjacent to listed species habitats to develop measures to avoid and minimize impacts to these species

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 threatened and endangered 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 this office.

Thank you for coordinating with us. We appreciate the opportunity to review this Program. If you require additional information or assistance please contact Steve Papa of the Long Island Field Office at (631) 286-0485, extension 2120.

Sincerely,

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

APPENDIX D: STATE LISTED THREATENED and ENDANGERED SPECIES in the STATE of NEW YORK and 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 *Wildlife Hazard Reduction Program: John F. Kennedy International Airport.* 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

APPENDIX E: HISTORIC and CURLTURAL RESOURCE CONSULTATION with NYS OFFICE of PARKS, RECREATION, and HISTORIC PRESERVATION

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

Re: USDA
Wildlife Hazard Reduction Program: John F. Kennedy International Airport Queens, Queens County
19PR02135

Dear Mr. Gosser:

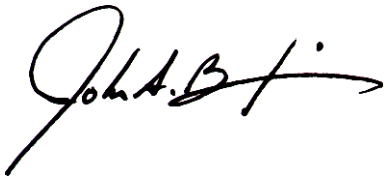
Thank you for requesting the comments of the State Historic Preservation Office (SHPO). We have reviewed the project in accordance with Section 106 of the National Historic Preservation Act of 1966. These comments are those of the SHPO and relate only to Historic/Cultural resources. They do not include 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



APPENDIX F: STATE of NEW YORK DEPARTMENT of STATE CONSULTATION REGARDING COASTAL ZONE RESOURCES

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

ANDREW M. CUOMO
GOVERNOR

ROSSANA ROSADO
SECRETARY OF STATE

June 10, 2019

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

Re: **F-2019-0370 (DA)**
U.S. Department of Agriculture (USDA) –
Animal and Plant Health Inspection Service (APHIS),
Wildlife Services (WS)
USDA Direct Action – and FAA approval
John F. Kennedy International Airport (JFK) –
Wildlife Hazard Reduction Program (2019)
JFK Airport and 7-mile radius,
Queens, NY; *Jamaica Bay*

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-2019-0370 (DA).

Sincerely,

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

GLC/ TS
Cc: DEC Region 2 – Steve Watts

NEW YORK STATE OF OPPORTUNITY. Department of State