SUPPLEMENT TO THE ENVIRONMENTAL ASSESSMENT: REDUCING BIRD DAMAGE THROUGH AN INTEGRATED WILDLIFE DAMAGE MANAGEMENT PROGRAM IN THE STATE OF NEW JERSEY

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

In Cooperation with:

United States Department of Interior
Unites States Fish and Wildlife Service

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I. INTRODUCTION

The United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Wildlife Services (WS) program prepared an environmental assessment (EA) to evaluate potential impacts to the quality of the human environment from the implementation of a management program to address damage to property, agricultural resources, natural resources, and threats to human safety caused by birds in New Jersey (USDA 2003)[1]. The EA evaluated the need for damage management and the relative effectiveness of four alternatives to meet that proposed need, while accounting for the potential environmental effects of those activities. WS' proposed action in the EA evaluates an integrated damage management program in the State to fully address the need for resolving damage caused by birds while minimizing impacts to the human environment.

The EA analyzes the effects of WS' activities to reduce damage and threats associated with several bird species. Bird species addressed in the EA and this supplement include double-crested cormorants (*Phalacrocorax auritus*), great blue herons (*Ardea herodias*), great egrets (*Ardea alba*), snowy egrets (*Egretta thula*), little blue herons (*Egretta caerulea*), cattle egrets (*Bubulcus ibis*), black vultures (*Coragyps atratus*), turkey vultures (*Cathartes aura*), snow geese (*Chen caerulescens*), mute swans (*Cygnus olor*), tundra swans (*Cygnus columbianus*), American black ducks (*Anas rubripes*), mallards (*Anas platyrhynchos*), osprey (*Pandion haliaetus*), northern harriers (*Circus cyaneus*), rough-legged hawks (*Buteo lagopus*), red-tailed hawks (*Buteo jamaicensis*), American kestrels (*Falco sparverius*), ring-necked pheasants (*Phasianus colchicus*), wild turkeys (*Meleagris gallopavo*), killdeer (*Charadrius vociferus*), laughing gulls (*Larus atricilla*), ring-billed gulls (*Larus delawarensis*), herring gulls (*Larus argentatus*), great black-backed gulls (*Larus marinus*), rock pigeons (*Columbia livia*), mourning doves (*Zenaida macroura*), monk parakeets (*Myiopsitta monachus*), belted kingfishers (*Megaceryle alcyon*), red-bellied woodpeckers (*Melanerpes carolinus*), downy woodpeckers (*Picoides pubescens*), hairy woodpeckers (*Picoides villosus*), blue jays (*Cyabicutta crustata*), American crows (*Corvus brachyrhynchos*), fish crows (*Corvus ossifragus*), tree swallows (*Iridoprocne bicolor*), bank swallows (*Riparia riparia*), barn swallows (*Hirundo rustica*), gray catbirds (*Dumetella carolinensis*), northern mockingbirds (*Mimus polyglottos*), European starlings (*Sturnus vulgaris*), snow buntings (*Plectrophenax nivalis*), red-winged blackbirds (*Agelaius phoeniceus*), eastern meadowlarks (*Sturnella magna*), common grackles (*Quiscalus quiscula*), brown-headed cowbirds (*Molothrus ater*), house sparrows (*Passer domesticus*), and domestic waterfowl (ducks and geese).

II. PUBLIC INVOLVEMENT

The pre-decisional EA[2] was made available to the public for review and comment during a 30-day public comment period by a legal notice published in the *Gloucester County Times, The Press of Atlantic City, The Star Ledger, Courier Post,* and *Today's Sunbeam* on August 22, 2003. A letter of availability for the pre-decisional EA was also mailed directly to agencies, organizations, and individuals with probable interest in the proposed program. A total of fifteen comment documents were received from the public during the public involvement process. Comments from the public involvement process were reviewed for substantive issues and alternatives which were considered in developing the Decision for the EA. Based upon those comments, several minor editorial changes were incorporated into the EA. Those

[1]Copies of the EA and the associated Decision/Finding of No Significant Impact (FONSI) are available for review from the State Director, USDA APHIS WS, 140-C Locust Grove Road, Pittstown, NJ 08867 or from the APHIS website at http://www.aphis.usda.gov/wildlife_damage/nepa.shtml.

[2]Before a Decision for the EA is issued, the EA is considered pre-decisional. After the development of the EA by WS and consulting agencies and after public involvement in identifying new issues and alternatives, WS issues a Decision. Based on the analysis in the EA after public involvement, a decision is made to either publish a Notice of Intent to prepare an Environmental Impact Statement or a Finding of No Significant Impact will be noticed to the public in accordance to the NEPA, the Council of Environmental Quality regulations, and APHIS' NEPA implementation regulations.

minor changes enhanced the understanding of the proposed program, but did not change the analysis provided in the EA.

After consideration of the analysis contained in the pre-decisional EA and review of public comments, a Decision and Finding of No Significant Impact (FONSI) for the EA was issued on October 20, 2003. The Decision and FONSI selected the proposed action which implemented an integrated damage management program in New Jersey using multiple methods to adequately address the need to manage damage caused by birds.

This summary report and supplement to the EA, along with the EA and the 2003 Decision/FONSI, will be made available for public review and comment through the publication of a legal notice announcing a minimum of a 30-day comment period. The legal notice will be published in *The Times of Trenton* and posted on the APHIS website located at http://www.aphis.usda.gov/wildlife_damage/nepa.shtml according to WS' public notification requirements (72 FR 13237-13238). A notice of availability for this summary report and the supplement to the EA will also be directly mailed to agencies, organizations, and individuals with probable interest in the proposed program. Comments received during the public involvement process will be fully considered for new substantive issues and alternatives.

III. SCOPE AND PURPOSE

The scope and purpose of the EA will remain as addressed in section 1.2 of the EA (USDA 2003). This summary report along with the proposed supplement to the EA examines potential environmental impacts of WS' program as it relates to: 1) conducting disease surveillance and monitoring in avian populations, particularly monitoring for the presence of avian influenza and West Nile virus, 2) an increase in the number of requests for assistance to manage bird damage and threats in New Jersey, 3) new issues and data that have become available from public comments, research findings, and data gathering since the issuance of the 2003 Decision/FONSI and the last monitoring report, and 4) analyses of WS' bird damage management activities in New Jersey since the 2003 Decision/FONSI was issued to ensure program activities are within the impact parameters analyzed in the EA.

The summary report and the proposed supplement to the EA are two separate analyses; however, to simplify WS' environmental processes and reduce the volume of paper those analyses are being combined into a single record. The summary report will pertain to the analyses of WS' bird damage management activities conducted in New Jersey since the 2003 Decision/FONSI was signed for the EA to ensure WS' activities remain within the scope of analyses contained in the EA. The supplement to the EA will analyze the need for increasing WS' bird damage management activities as described in the proposed action of the EA along with the potential impacts to the human environment to meet those increasing needs.

IV. NEED FOR ACTION

A description of the need for action to address damage and threats associated with birds in New Jersey is provided in section 1.3 of the EA (USDA 2003). The need for action addressed in the EA remains applicable to this proposed supplement to the EA and the summary report. The need for action is based on a need to manage bird damage to agricultural resources, natural resources, and property, including threats to human safety associated with birds.

Since the completion of the EA, the United States Fish and Wildlife Service (USFWS) has prepared a Final Environmental Impact Statement (FEIS) to address damage associated with an increasing population of double-crested cormorants in the United States. The increasing population of cormorants has lead to damage and threats of damage to agricultural resources, natural resources, property, and

human safety (USFWS 2003)[3]. Additional information on cormorant populations and damage threats can be found in the double-crested cormorant management FEIS prepared by the USFWS (USFWS 2003).

As shown in Table 1, WS has conducted 862 technical assistance projects involving bird damage to agricultural resources, natural resources, property, and human safety since FY 2003 in New Jersey, excluding those technical assistance projects conducted for Canada geese. Technical assistance provides those persons requesting assistance with information on wildlife identification, damage identification, and methods available to resolve wildlife damage without WS' direct involvement. The number of technical assistance projects conducted annually by WS has increased from 96 projects conducted in FY 2003 to 205 projects conducted in FY 2008 which is an increase of nearly 114%. Over 51% of the requests for technical assistance received by WS since FY 2003 involved bird damage to property in the State.

Table 1 – Number of requests for technical assistance* to manage damage caused by birds in New Jersey since FY 2003

Resource Type	Fiscal Year						Total
	2003	2004	2005	2006	2007	2008	
Property	48	43	87	95	77	91	**441**
Agriculture	20	41	26	13	19	27	**146**
Natural Resources	1	7	9	9	9	9	**44**
Human Safety	27	7	21	56	42	78	**231**
Total	**96**	**98**	**143**	**173**	**147**	**205**	**862**

*Data presented in the above table were taken from NJ WS Annual Program Reports and represents the number of technical assistance projects conducted by the NJ WS program. Data does not represent operational assistance projects conducted during the time period covered.

During requests for assistance received by WS, cooperators often report or WS verifies through site visits, damage associated with various species of birds in the State. Since FY 2005, damage has been reported to WS or WS has verified over $600,000 in damages caused by birds in the State, excluding damage caused by Canada geese (see Table 2). Damages have been reported or verified as occurring primarily to property and agricultural resources. Nearly $367,000 in damage to property has been reported to or verified by WS in the State since FY 2005 with damage to agricultural resources exceeding $170,000 in damages.

Table 2 – Reported or WS verified monetary damage by resource caused by birds in New Jersey

Resource Type	Fiscal Year				Total
	2005	2006	2007	2008	
Property	$41,025	$15,445	$182,842	$127,647	**$366,959**
Agriculture	$47,700	$22,150	$20,850	$79,600	**$170,300**
Natural Resources	$58,000	$3,000	$0	$0	**$61,000**
Human Safety	$500	$1,850	$0	$578	**$2,928**
Total	**$147,225**	**$42,445**	**$203,692**	**$207,825**	**$601,187**

Table 2 only reflects damage that has been reported to or verified by WS based on requests received for assistance. Assigned monetary damage to natural resources can be difficult especially when factoring in the lost aesthetic value when natural resources are damaged by birds. Similarly, placing a monetary value on threats to human safety can be difficult. Monetary damage reported in Table 2 reflects damage that

[3]The FEIS may be obtained by contacting the Division of Migratory Bird Management, United States Fish and Wildlife Service, 4401 North Fairfax Drive, MBSP-4107, Arlington, Virginia 22203 or by downloading it from the USFWS website at http://www.fws.gov/migratorybirds/CurrentBirdIssues/Management/cormorant/cormorant.html. WS' ROD may be viewed at http://www.aphis.usda.gov/wildlife_damage/nepa.shtml.

has occurred and that has been reported to WS, but is not reflective of all bird damage occurring in the State since not all bird damage or threats are reported to WS.

Proposed Supplement to the EA

WS continues to receive requests for assistance to manage damage and threats to human safety caused by birds in New Jersey. Since the federal fiscal year[4] (FY) 2003, WS has responded to requests for assistance to manage damage to property, agricultural resources, natural resources, and human safety caused by birds. WS is also being requesting to participate in disease surveillance and monitoring programs to detect and evaluate risks associated with avian diseases. Since the completion of the EA, the number of requests for assistance has increased associated with damage caused by mallards, osprey, wild turkeys, killdeer, ring-billed gulls, herring gulls, great black-backed gulls, and mourning doves. The supplement is also being prepared to include the USFWS as a cooperating agency on the EA and the proposed supplement to the EA for the purpose of issuing depredation permits associated with those species addressed in the EA and the proposed supplement to the EA. In addition, the supplement will clarify information in the EA regarding the lethal take of pigeons in New Jersey by WS pursuant to New Jersey Statutes.

Disease Surveillance and Monitoring

Public awareness and health risks associated with avian zoonoses have increased in recent years. One of the first avian zoonoses to gain public attention was the West Nile Virus (WNV) with outbreaks of the virus first reported in the United States in 1999. Today, WNV has been documented to occur in all 48 conterminous States. In 2008, the Centers for Disease Control and Prevention (CDC) reported 1,356 documented cases of WNV infections in humans in 45 States with 44 deaths (CDC 2009a). In New Jersey, the CDC reported 10 cases of WNV with two deaths in 2008 (CDC 2009a). WS continues to provide technical assistance to those individuals requesting information on WNV and provides information on current WNV monitoring activities. The WS program in New Jersey is not currently actively collecting samples for WNV in the State. If a large outbreak of WNV is detected in New Jersey, WS as part of an interagency team will likely begin collecting samples from avian species as part of a disease monitoring program. This proposed amendment to the EA will address monitoring activities for WNV through collections of avian species for sampling purposes.

Another avian zoonosis gaining public awareness is the high pathogenic H5N1 avian influenza (AI) virus. AI is an influenza virus naturally occurring in birds worldwide. Many subtypes of type A influenza virus are known with subtypes differing between types of hemagglutinin (HA) and neuraminidase (NA) proteins on the surface of the influenza virus (CDC 2009b). The CDC (2009b) reports 16 known HA protein subtypes and nine known NA protein subtypes of the influenza A virus resulting in numerous possible combinations of proteins with each combination resulting in a different subtype. Birds are known to carry all known subtypes of the influenza A virus, however most subtypes of influenza A virus do not cause illness in birds (CDC 2009b). Despite a lack of clinical illness in most bird species from AI infections, AI is very contagious among birds and can cause severe illness and death in domestic birds, such as chickens, waterfowl, and turkeys (CDC 2009b).

Birds infected with AI shed the virus in saliva, nasal secretions, and feces. Infection can occur from direct contact with the bodily fluids of infected birds or from surfaces contaminated with bodily fluids of infected birds (CDC 2009b).

[4]The federal fiscal year begins on October 1 and ends on September 31 the following year.

There are two main forms of AI infections in domestic poultry and waterfowl that are distinguished based on a high and low virulence rate. Low pathogenic AI typically goes undetected in bird species with birds showing mild symptoms, such as ruffled feathers or a reduction in egg production. High pathogenic AI is highly virulent and can spread rapidly in domestic poultry and waterfowl and can cause high mortality rates, often within 48 hours of infection (CDC 2009b).

AI refers to influenza virus infections that are found primarily in birds; however, the main concern with the AI virus is that human infections are known to occur (CDC 2009b). The risk of human infection from AI viruses is low since most AI virus subtypes do not usually infect humans. However, the CDC (2009b) reports that since 1997 the infection of humans with several subtypes of AI have been documented to occur. Human contraction of AI occurs mainly from contact with infected poultry and waterfowl or from contact with contaminated surfaces. Transmission of AI viruses from human to human is thought to rarely occur.

There are three known subtypes of influenza viruses that are currently known to be circulating in the human population that are generically termed human influenza viruses. These three subtypes are H1N1, H1N2, and H3N2 influenza viruses. Current information indicates that those three subtypes of influenza virus commonly infecting humans likely originated from birds based on the genetic similarities of the human and avian influenza subtypes. The primary concern of influenza viruses is that selection processes are constantly changing the virus and that those changes may lead to an adaptation of AI viruses into highly contagious zoonoses (CDC 2009b).

The AI virus subtype of most concern in the high pathogenic H5N1 virus that occurs primarily in birds and is highly contagious with a high mortality rate in certain avian species. The CDC (2009b) reports that of the AI subtypes that are known to occasionally infect humans; the H5N1 subtype has accounted for the greatest number of detected cases in humans and caused the most severe symptoms along with the most deaths. However, the severity of symptoms and the high number of deaths attributed to H5N1 increases the likelihood of reporting of the subtype compared to the milder symptoms of other AI viruses that are likely to go undiagnosed or unreported (CDC 2009b). Since 1997, reported human cases of H5N1 infections associated with outbreaks of the virus in poultry and waterfowl have occurred in Asia, parts of Europe, and Africa with more than half the reported human cases of high pathogenic H5N1 resulting in death (CDC 2009b). As stated previously, human to human transmission has been documented to occur rarely with most human infections occurring from direct contact with infected birds or from contact with surfaces contaminated by infectious birds. Despite the current inefficiency of transmission from human to human, the ability of the virus to change from external pressures has raised the concern that the highly virulent H5N1 virus could change to a form that readily infects humans with a high likelihood of human to human transmission (CDC 2009b). Since AI subtypes do not readily infect humans, an immune response to the AI subtypes does not currently exist in the majority of the human population. If the high pathogenic H5N1 virus gains the ability to readily be transmitted from human to human, the lack of immune protection in humans could lead to a pandemic that could result in a large number of deaths (CDC 2009b).

Numerous potential routes for introduction of the virus into the United States exists including illegal movement of domestic or wild birds, contaminated products, and the migration of infected wild birds. Given the occurrence of high pathogenic H5N1 AI in wild birds, there is concern that migrating birds will introduce the virus into new regions of the world, including North America. Many bird species that nest in Arctic Siberia, Alaska, and Canada follow migratory flyways southward to wintering areas in the United States, Central America, and South America. Birds from both Eastern Siberia and Alaska intermingle in several of the established flyways. The overlap at the northern ends of those flyways establishes a geographic location for potential disease transmission across continents and for mixing, change, and exchange of genetic material among strains from Eurasia and North America. If high

pathogenic H5N1 AI virus spreads to North America by migratory birds, the virus would most likely arrive first in Alaska and spread south through the flyways by this route (USDA 2005).

Therefore, at the request of the Homeland Security Council's Policy Coordinating Committee for Pandemic Influenza Preparedness, the USDA and the United States Department of Interior (DOI) were requested to develop and coordinate a National Strategic Plan (USDA 2005) for early detection of high pathogenic H5N1 AI into North America by wild birds. The nationwide surveillance effort has detected some instances of low pathogenic AI viruses, as was expected given that waterfowl and shorebirds are considered to be the natural reservoirs for AI. Tens of thousands of birds have been tested, but there has been no evidence of the high pathogenic H5N1 virus in North America.

WS will continue to work as part of an interagency team in conducting surveillance for AI and WNV in bird species. Based on WS' participation in conducting disease surveillance and monitoring as part of an interdisciplinary team, WS' anticipates a need to continue efforts to monitor and detect the presence of avian zoonoses to determine threats and risks to human health and safety. This supplement to the EA will address WS' avian disease monitoring and surveillance activities, as related to sample collecting under surveillance and monitoring activities. Other communicable diseases addressed in section 1.3 of the EA will remain as addressed.

Addressing Increasing Requests for Assistance Received by WS in New Jersey

The need for an increase in damage management activities associated with mallards, osprey, wild turkeys, killdeer, ring-billed gulls, herring gulls, great black-backed gulls, and mourning doves in the State is based on an increase in the number of requests received to manage damage caused by those species. As part of the requests for assistance, WS reasonably anticipates an increase in the number of birds requested to be lethally removed as part of an integrated damage management strategy to reducing damage and threats. WS also anticipates an increase in non-lethal harassment and dispersal of those bird species addressed in the proposed supplement as part of the increasing requests for assistance.

To assist with communicating to the public the individual and cumulative impacts associated with managing increasing damage and threats associated with mallards, osprey, wild turkeys, killdeer, ring-billed gulls, herring gulls, great black-backed gulls, and mourning doves in New Jersey; those activities are being further analyzed and addressed in this supplement to the EA. Information regarding the need for action to manage damage associated with mallards, osprey, wild turkeys, killdeer, ring-billed gulls, herring gulls, great black-backed gulls, and mourning doves are evaluated by species below.

Mallards

The presence of mallards on or near airport properties has been an increasing concern for several airports in New Jersey. The flocking behavior of mallards, especially during spring and fall migrations, can pose threats to aircraft when those flocks are present on airport property or near airport property. Aircraft striking birds can cause extensive damage to the aircraft. Bird strikes can also lead to catastrophic failure of the aircraft which can lead to a crash which threatens human safety. Since 1990, at least 83 aircraft strikes have been reported in New Jersey involving mallards with at least 508 reported strikes with mallards across the United States (FAA 2009). From 1990 through 2007, aircraft strikes associated with mallards in the United States have resulted in 8,406 hours of aircraft downtime and over $5.1 million in damages to aircraft (Dolbeer and Wright 2008).

The breeding population of mallards in the northeastern United States has shown recent increasing trends from survey data. The number of mallards observed during the 2009 breeding waterfowl survey

conducted in the northeastern United States increased 8% compared to the estimated number of mallards breeding in the northeast during 2008 (USFWS 2009).

Under the proposed action addressed in the EA, WS would implement an integrated approach to resolving requests for assistance to manage damage and threats associated with mallards in the State. If the number of requests for assistance increases, the number of mallards addressed by WS to manage damage and threats is also likely to increase. Since both lethal and non-lethal methods could be employed under the proposed action, the number of birds lethally taken and the number of birds dispersed using non-lethal methods is also likely to increase. The EA evaluated the take of up to 50 mallards annually and up to 20 mallard nests by WS to alleviate damage and threats when lethal methods were deemed appropriate to resolve the request for assistance using the WS Decision Model. The estimated take in the EA was based on requests received prior to the development of the EA. If the number of requests to provide assistance with managing damage and threats associated with mallards increases, an estimated 150 mallards could be lethally taken by WS annually using those methods described in the EA. In addition, up to 50 mallard nests could also be destroyed to discourage nesting in areas where damage has occurred.

Osprey

The WS program in New Jersey has previously been requested to assist in preventing threats to human health and safety that may occur from the existence or construction of osprey nests, primarily on power poles but nesting activities could also occur on other structures. Osprey nests are often constructed of large sticks and twigs that can cause disruptions in the electrical power supply when located on utility structures and can inhibit access to utility structures for maintenance by creating obstacles to workers. The average osprey nest size in Corvallis, Oregon weighed 264 pounds and was 41-inches in diameter (USGS 2005). In 2001, 74% of occupied osprey nests along the Willamette River in Oregon occurred on power pole sites (USGS 2005). Debris from osprey nests often comes into contact with high voltage transformers and wires which can result in the destruction of the transformer and power failures. The loss of power to facilities can pose a threat to human safety and prevents facilities from fulfilling mission critical operations. Ospreys are also known to construct nests on property utilized for human activity, such as on boats. A survey of nesting osprey in New Jersey found that 75% of nesting osprey use single-post platforms erected for nesting while 8% of osprey nests occurred on cell towers, 4% occurred on channel markers, 3% nested on duck blinds, 2% occurred on dead trees, and 7% nested on other structures (Clark and Wurst 2009). Osprey nesting near airports can also pose risks of aircraft striking osprey causing damage to aircraft and threatening aviation safety. Since 1990, there have been four strikes reported to the Federal Aviation Administration (FAA) involving an aircraft striking osprey at airports in the State (FAA 2009).

To reduce further damages and threats associated with osprey nests, WS has been requested to participate in the removal of nests and to collect any osprey eggs and/or nestlings currently in those nests for transport to a State-approved rehabilitator or to relocate eggs to other osprey nests. Eggs provided to a rehabilitator would be subsequently cared for until the eggs hatch. The chicks would then be reared to fledglings and then released into appropriate habitat once the rehabilitator determines the fledglings can survive on their own. The New Jersey Division of Fish and Wildlife (NJDFW) currently considers the breeding population of osprey in the State as threatened.

Based on previous requests for assistance, WS may be requested to relocate or remove up to five osprey nests annually in the State to alleviate damage. In addition, WS may be requested to relocate eggs and/or nestlings to another nest or provide the eggs to a State-approved rehabilitator for rearing and release. If a State-approved rehabilitator is unavailable and as permitted by the NJDFW and the USFWS, up to 20 eggs may be destroyed to alleviate damage and threats. The destruction of eggs will only occur if the nest

is deemed an immediate threat to human safety when permitted by the NJDFW and the USFWS and only if an approved rehabilitator can not be located.

Wild Turkeys

Requests for assistance to manage damage and threats associated with wild turkeys received by WS in New Jersey are associated with threats of aircraft striking turkeys at airports. However, turkeys are also known to cause damage to agricultural resources and property. Damage to agricultural resources occurs primarily through consumption of sprouting crops or the consumption of grain. Damage can also occur from fecal contamination of stored grain. Damage to property occurs from fecal droppings that accumulate under areas where turkeys roost. Fecal droppings are also aesthetically displeasing and can require continual cleaning. WS has also received requests for assistance from homeowners to alleviate threats from the aggressive behavior of turkeys during the nesting season, including damage to windows from turkeys attacking their reflections.

Since the completion of the EA, WS has received several requests for assistance to manage threats associated with turkeys at airports in New Jersey. To assist with requests, WS has employed both technical assistance and direct operational assistance. Technical and operational assistance are described in detail in the EA (USDA 2003). WS has responded to most requests through technical assistance and when operational assistance was requested, WS has employed mainly non-lethal harassment methods to disperse turkeys from areas where threats were occurring. WS also has been requested to lethally remove turkeys that were posing a direct threat to aircraft and passenger safety. Resolving damage caused by wild turkeys was not specifically addressed in the EA (USDA 2003). Based on previous requests for assistance to manage damage or threats associated with wild turkeys in the State, WS reasonably anticipates that up to 20 wild turkeys may be taken annually to resolve requests for assistance.

Killdeer

Similar to the other bird species addressed in the supplement, requests for assistance to manage damage and threats associated with killdeer in New Jersey occur primarily at airports where killdeer can cause damage to aircraft or threaten human safety from aircraft strikes. In the United States, 1,635 aircraft strikes have been reported involving killdeer with 66 occurring at airports in New Jersey (FAA 2009). Nearly $2.4 million in damages to civil aircraft have been reported from aircraft striking killdeer with nearly 280 hours of aircraft down time after a strike occurs for repairs (Dolbeer and Wright 2008).

The nesting habitat of killdeer has been described as open areas with grass or forbs less than 1 cm tall (Jackson and Jackson 2000). Nesting occurs on sandbars, mudflats, pastures, cultivated fields, airports, golf courses, parking lots, and graveled rooftops (Jackson and Jackson 2000). Airports often provide ideal nesting habitat for killdeer with nesting often occurring along the edges of runways and taxiways. As additional airports request assistance with managing threats and damage associated with aircraft potentially striking killdeer, the number of killdeer addressed by WS annually is also likely to increase.

Based on requests for assistance received when the EA was developed, the EA evaluated a lethal take of up to 50 killdeer annually, primarily to alleviate damage and threats at airports. To address an increasing number of requests for assistance, WS may take up to 75 killdeer annually in the State to alleviate damages and reduce threats.

Gulls

Several species of gulls are known to cause damage to agricultural resources, property, and natural resources including posing threats to human safety. Damages and threats associated with ring-billed

gulls, herring gulls, and great black-backed gulls were addressed in the EA. Gulls frequent landfills to feed and loaf which can cause damage to equipment and buildings at the landfill from excessive accumulations of droppings. Gulls also pick up refuse at landfills and carry it off the property to feed which deposits pieces of garbage in neighboring areas. Gulls attracted to a landfill often loaf on buildings in neighboring areas which can cause damage to buildings, equipment, vehicles, boats, and other private property through excessive accumulations of droppings.

WS has also been requested to assist in eliminating damage to property associated with gulls nesting on rooftops of buildings. Nesting gulls cause damage through excessive droppings, pecking roofing material that can result in roof leaks, and from the accumulation of nesting material that can clog rooftop drains creating risks of leaks, flooding, and roof collapse. The flocking behavior of gulls can also pose threats to aircraft at airports.

Based on the number of requests received by WS to manage damage and threats associated with gulls during the development of the EA, the EA evaluated the lethal take of up to 250 ring-billed gulls, 250 herring gulls, and 150 great black-backed gulls as part of an integrated approach to resolving requests for assistance (USDA 2003). Since the completion of the EA, the number of requests for assistance received by WS to manage gull damage and threats at landfills, airports, and from rooftop nesting has increased. As part of an integrated approach to managing damage and threats using both lethal and non-lethal methods as described in the EA, the annual take of gulls to alleviate damage is also likely to increase during the implementation of the proposed action. Under the proposed supplement to the EA, WS will evaluate the lethal take of up to 400 ring-billed gulls, 400 herring gulls, and 400 great black-backed gulls.

Mourning Doves

The number of requests for assistance to reduce threats and damage associated with mourning doves has increased, primarily at airports. Threats associated with mourning doves at airports occur primarily during the spring and fall migration periods when doves congregate into large flocks. Since 2003, 55 aircraft strikes have been reported in the State involving mourning doves (FAA 2009). The flocking behavior associated with mourning doves increases the likelihood of ingesting multiple doves into aircraft engines which can cause catastrophic failure of aircraft systems which can threaten passenger safety.

Damage caused by and threats associated with mourning doves were directly addressed in the EA (USDA 2003). To reduce threats and damages associated with mourning doves using an integrated approach, the EA evaluated that during implementation of the proposed action that WS could lethally take up to 50 doves in addition to the dispersal of doves using non-lethal methods. Based on requests for assistance from airports to address mourning dove threats to aircraft and the anticipation of additional requests for assistance from airports, WS reasonably anticipates the number of mourning doves addressed by WS to increase. As discussed in the proposed action in the EA, a combination of both lethal and non-lethal methods are employed in an integrated approach to resolve damage and threats. WS anticipates the number of doves harassed using non-lethal methods and the number of doves lethally taken to increase annually based on increasing requests for assistance. Based on current and the potential for additional requests for assistance, WS' lethal take of doves could increase to 150 annually.

As stated previously, the proposed supplement will evaluate potential impacts related to the increased need for the reduction of threats associated with mallards, osprey, wild turkeys, killdeer, ring-billed gulls, herring gulls, great black-backed gulls, and mourning doves in the State. WS will continue to employ methods in an integrated approach to effectively reduce threats and damages associated with those species in the State. Methods available to WS as part of an integrated approach are evaluated and discussed in detail in Appendix B of the EA (USDA 2003). The increased use of those methods to address an

increasing number of requests for assistance will be further evaluated in this proposed supplement to the EA.

Issuance of Depredation Permits by the USFWS to Lethally Take Birds in the State

The Migratory Bird Treaty Act (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 U.S.C 703-711). A list of bird species protected under the MBTA can be found in 50 CFR 10.13.

The MBTA does allow for the lethal take of those bird species listed in 50 CFR 10.13 when depredation occurs through the issuance of depredation permits or the establishment of depredation orders. Under authorities in the MBTA, the USFWS is the federal agency responsible for the issuance of depredation permits or the establishment of depredation orders for the take of those protected bird species when damage or threats of damage are occurring. Information regarding migratory bird permits can be found in 50 CFR 13 and 50 CFR 21.

The USFWS will be a cooperating agency during the development of the proposed supplement to the EA to analyze cumulative take of those bird species addressed in the EA and this supplement from the issuance of depredation permits to entities within the State of New Jersey. The USFWS has jurisdiction over the management of migratory birds and has specialized expertise in identifying and quantifying potential adverse affects to the human environment from bird damage management activities. The analyses in this proposed supplement to the EA and the analyses in the EA will ensure the USFWS compliance with the NEPA for the issuance of depredation permits for the take of those birds species addressed in the EA and the supplement to the EA.

New Jersey Statutes Regarding Pigeons

Under New Jersey Statutes, pigeons and their nests/eggs cannot be taken (NJSA 23:4-53) unless the New Jersey Department of Health and Senior Services (NJDHSS) or a local board of health authorizes the removal of feral pigeons upon finding that those pigeons constitute a hazard to human health (NJSA 26:2-86).

The EA evaluated a lethal take of up to 1,000 pigeons and up to 1,000 pigeon nests annually by WS in the State using lethal methods in an integrated approach that includes the use of non-lethal methods to resolve requests for assistance. For clarification purposes of the pigeon population impact analyses conducted in the EA, WS would only conduct pigeon damage management activities after receiving authorization from either the NJDHSS or a local board of health. Therefore, no take of pigeons would occur without the proper authorizations. If the appropriate authorizations are received by WS from the NJDHSS or a local board of health, up to 1,000 pigeons and up to 1,000 nests could be taken under the proposed action address in the EA.

V. RELATIONSHIP OF THIS EA TO OTHER ENVIRONMENTAL DOCUMENTS

Information from the following documents has been incorporated by reference into the EA, this report, and the proposed supplement.

WS' Programmatic Final Environmental Impact Statement: WS has developed a programmatic FEIS[5] that addresses the need for wildlife damage management in the United States (USDA 1997). The FEIS contains detailed discussions of potential impacts to the human environment from wildlife damage management methods used by WS. Pertinent information available in the FEIS has been incorporated by reference into the EA, this proposed supplement to the EA, and the summary report.

Double-crested Cormorant Management in the United States Final Environmental Impact Statement: The USFWS has prepared a FEIS on the management of double-crested cormorants (USFWS 2003). WS was a formal cooperating agency in the preparation of the FEIS and has adopted the FEIS to support WS' program decisions for its involvement in the management of cormorant damage. WS completed a Record of Decision (ROD) on November 18, 2003 (68 FR 68020). Pertinent and current information available in the FEIS have been incorporated by reference into the EA and this document.

Light Goose Management Final Environmental Impact Statement: The USFWS has also prepared a FEIS to address the management of snow geese and Ross's geese (USFWS 2007)[6]. The preferred alternative in the FEIS modified existing regulations to allow additional hunting methods to harvest snow geese and Ross's geese within the current migratory bird hunting season frameworks. The preferred alternative also created a conservation order for the management of overabundant snow goose populations (50 CFR 21.60).

Environmental Assessment: Canada Goose Damage Management in New Jersey: WS has developed an EA that analyzes a need for action to manage damage associated with Canada geese (*Branta canadensis*) in New Jersey (USDA 2002). The EA identified issues associated with goose damage management and analyzed alternatives to address those issues. After review of the analyses in the EA, a Decision and FONSI were signed on April 18, 2002, selecting the proposed action to implement an integrated approach to manage goose damage in the State. The EA and the 2002 Decision/FONSI were re-evaluated based on activities conducted by WS since the signing of the Decision in 2002. Based on the analyses in the summary report, a new Decision and FONSI were signed on January 4, 2007.

VI. SCOPE OF ANALYSIS

The EA, this summary report, and the proposed supplement to the EA evaluate bird damage management activities in New Jersey to reduce damage and threats to agricultural resources, natural resources, property, and threats to human safety. The scope of analysis remains valid as addressed in the EA unless otherwise discussed in the proposed supplement.

Site Specificity

The EA and this proposed supplement analyze the potential impacts of wildlife damage management activities that will occur or could occur in New Jersey when requested by a cooperating entity. WS uses a decision model based on a publication by Slate et al. (1992) which involves evaluating each threat situation, taking action, evaluating the action, and monitoring results of the actions taken. The published article provides more detail on the processes used in WS' Decision Model. WS' programmatic FEIS (USDA 1997) provides more detail and examples of how the model is used. WS' personnel use the Decision Model to develop the most appropriate strategy to reduce damage and to determine potential environmental effects from damage management actions (Slate et al. 1992, USDA 1997, USDA 2003).

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[5]Copies of WS' programmatic FEIS are available from USDA/APHIS/WS-Operational Support Staff, 4700 River Road, Unit 87, Riverdale, MD 20737-1234.

[6]The FEIS can be obtained from the USFWS website at http://www.fws.gov/migratorybirds/CurrentBirdIssues/Management/snowgse/FinalEIS2007/Light%20goose%20EIS.pdf.

VII. AUTHORITY AND COMPLIANCE

WS' activities to reduce damage and threats associated with birds are regulated by federal, state, and local laws and regulations. The authority of WS and compliance with relevant laws and regulations are discussed in detail in Section 1.1 of the EA (USDA 2003). WS' activities are also conducted consistent with relevant Executive Orders which were also discussed in Section 1.1 of the EA (USDA 2003). Compliance with laws and regulations not directly addressed in the EA will be discussed in this report and proposed supplement.

New Jersey Statutes Annotated 23:4-53 – Wild pigeons protected; penalty

Wild pigeons and their nests/eggs are afforded protection under New Jersey Statutes Annotated (NJSA), which states "*...no person shall capture, kill, injury or have in possession, living or dead, or attempt to capture, kill or injure, a wild or passenger pigeon, or destroy or interfere in any manner with the nest or eggs of a wild or passenger pigeon...*".

NJSA 26:2-86 – Destruction or removal of certain domestic pigeons

If a group of feral pigeons are deemed hazardous to the health of residents of the State by the New Jersey Department of Health or the local board of health, then take of those pigeons can occur when authorized under NJSA 26:2-86. The Statute reads "*...the* [New Jersey] *Department of Health or any local board of health within its jurisdiction may order and provide for the destruction or removal of escaped domestic pigeons that have become feral...upon a finding by the department or the board...that the presence of such escaped domestic pigeons in such area or place is hazardous to the health of any of the inhabitants of* [the] *State.*"

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.

VIII. ISSUES ANALYZED IN DETAIL

Issues are concerns raised regarding potential environmental problems that might occur from a proposed action. Such issues must be considered in the NEPA decision-making process. Issues relating to the reduction of wildlife damage were raised during the scoping process for WS' programmatic FEIS (USDA 1997) and were considered in the preparation of the EA. Issues related to managing damage and threats associated with birds in New Jersey were developed by WS in consultation with the USFWS, the NJDFW, and the New Jersey Department of Agriculture.

The major issues are discussed in detail in Chapter 2 of the EA (USDA 2003). Alternatives developed and identified during the development of the EA to address those issues are discussed in Chapter 3 of the

EA (USDA 2003). Potential impacts of Alternatives 1, 3, and 4 on the human environment related to the major issues have not changed from those described in the EA and thus do not require additional analyses in this report or the proposed supplement. Chapter 4 of the EA contains a detailed discussion and comparison of the identified alternatives and the major issues (USDA 2003). The issues were identified as important to the scope of the analysis in the EA (40 CFR 1508.25). Alternative 2 (proposed action/no action), as described in the EA, addresses requests for bird damage management in the State using an integrated damage management approach by WS to reduce damage to agricultural resources, property, natural resources, and threats to human safety. The following is an analysis of potential impacts for each of the major issues analyzed in the EA since the completion of the EA and the proposed supplement to the EA as related to Alternative 2 (proposed action/no action alternative):

Issue 1 - Effects on target bird species

The issue of the effects on target bird species arises from the use of non-lethal and lethal methods identified in the EA to address the need for reducing damage and threats associated with those bird species addressed in the EA. Methods employed in an integrated approach to reduce damage and threats are categorized into non-lethal and lethal methods. Non-lethal methods are employed to exclude, harass, and/or disperse wildlife from areas where damage or threats are occurring. Lethal methods are often employed to reinforce non-lethal methods and to remove birds that have been identified as causing damage or posing a threat to human safety. Both non-lethal and lethal methods have the potential to impact bird populations. The EA evaluated those potential impacts and found that when WS' activities are conducted within the scope analyzed in the EA, those activities would not adversely impact bird populations in New Jersey (USDA 2003). WS' mitigation measures and Standard Operating Procedures (SOP) are designed to reduce the effects on bird populations and are discussed in section 3.4 of the EA (USDA 2003).

WS has provided direct damage management and technical assistance in response to requests for assistance in New Jersey since the completion of the EA. Descriptions and application of direct damage management and technical assistance projects are discussed in detail in section 3.2 of the EA (USDA 2003). All bird damage management activities conducted by WS were pursuant to federal, State, and local laws and regulations.

The following is a summary of WS' activities to manage damage and threats caused by birds in New Jersey as requested by those seeking assistance since the completion of the EA in 2003.

Bird Damage Management Conducted in New Jersey by WS during FY 2003

WS continued to implement and employ an integrated damage management approach to reducing threats and damage caused by birds in FY 2003 through the recommendation and use of multiple methods. WS conducted 96 technical assistance projects in FY 2003 involving bird species through the recommendation of methods to resolve damage and threats without WS' direct involvement (see Table 3). Requests for assistance involved damage and threats to a variety of resources and often involved multiple resources (*e.g.*, vultures can cause damage to property by tearing shingles and pose a risk to human safety from fecal droppings in areas used by people). WS conducted 27 technical assistance projects involving turkey vultures in FY 2003 which was the highest of any bird species followed by ten technical assistance projects involving mallards. WS provided technical assistance to those requesting assistance involving at least 23 species of birds in New Jersey during FY 2003. Technical assistance was provided primarily to alleviate damage to property in FY 2003 with 50% of the projects conducted by WS involving damage to property.

Requests for assistance associated with turkey vultures arose primarily from concerns with disease risks and damage to property associated with accumulation of droppings that occur under vulture roosting and loafing sites. Vultures are also known to pull on and tear shingles on roofs and weather stripping around windows. Requests for assistance associated with mallards arose primarily from damage to property from feeding and threats to human safety associated with fecal droppings in public-use areas. Fecal droppings in public-use areas are aesthetically displeasing, requiring constant cleaning, and pose threats of disease transmission. In addition to vultures and mallards, WS conducted nine technical assistance projects involving European starlings in the State. WS continued to provide technical assistance through the recommendation of an integrated approach to resolving damage and threats that included lethal and non-lethal methods.

Table 3 – WS' technical assistance projects conducted in New Jersey during FY 2003 by species and resource

Species	Resource[a]				Total	Species	Resource				Total
	A	N	P	H			A	N	P	H	
Double-crested Cormorant	0	0	0	1	**1**	**Ring-billed Gull**	0	0	1	0	**1**
Great Blue Heron	5	0	0	0	**5**	**Herring Gull**	0	0	1	2	**3**
Black Vulture	0	0	5	1	**6**	**Great Black-backed Gull**	0	0	1	0	**1**
Turkey Vulture	0	0	24	3	**27**	**Rock Pigeon**	0	0	3	1	**4**
Mute Swan	0	1	0	1	**2**	**Great Horned Owl**	1	0	0	0	**1**
Tundra Swan	2	0	0	0	**2**	**Woodpecker (other)***	0	0	2	0	**2**
Mallard	0	0	4	6	**10**	**American Crow**	0	0	1	1	**2**
Snow Goose	5	0	0	0	**5**	**European Starling**	5	0	3	1	**9**
Osprey	0	0	0	2	**2**	**Common Grackle**	0	0	0	1	**1**
Red-tailed Hawk	1	0	1	0	**2**	**Feral Ducks**	0	0	0	1	**1**
Wild Turkey	0	0	0	1	**1**	**Feral Geese**	0	0	2	3	**5**
Laughing Gull	1	0	0	2	**3**	**TOTAL**	**20**	**1**	**48**	**27**	**96**

[a]A=Agricultural Resources, N=Natural Resource, P=Property, H=Human Safety

*WS information management system in FY 2003 did not have a species entry for recording all bird species addressed by WS.

As shown in Table 4, WS employed, through direct operational assistance, non-lethal techniques to harass and disperse birds identified as causing damage or threats in the State. Dispersal occurred through the use of those non-lethal methods described in Appendix B of the EA, primarily from the use of pyrotechnics and other noise producing methods (USDA 2003). A total of 24,918 birds were addressed using non-lethal methods in FY 2003. Over 91% of the birds dispersed were European starlings and laughing gulls. Of those birds addressed in FY 2003 by WS, nearly 97% were dispersed using non-lethal harassing techniques.

WS received requests for direct operational assistance to alleviate damage and reduce threats associated with at least 24 species of birds in New Jersey during FY 2003. WS addressed 12,766 European starlings in FY 2003 primarily to alleviate damage to agricultural resources and property. Over 94% of the European starlings addressed were non-lethally dispersed using pyrotechnics and other noise-producing methods. WS also addressed 10,839 laughing gulls in the State at the request of cooperators during FY 2003. Over 99% of the laughing gulls addressed in New Jersey during FY 2003 were dispersed using non-lethal harassment techniques, primarily from pyrotechnics and other noise-producing devices.

As part of an integrated approach to resolving requests for assistance to manage damage and threats, WS also employed lethal methods to reinforce non-lethal techniques and to remove those birds identified as causing damage or threats. As shown in Table 5, WS employed those methods described in the EA to lethally take 856 birds in FY 2003. Nearly 83% of those birds lethally taken were European starlings which are non-native species in North America. A total of 708 European starlings were lethally removed

in New Jersey during FY 2003 using primarily live-trapping and the avicide DRC-1339. Live-captured starlings were euthanized using carbon dioxide or cervical dislocation, which are euthanasia methods considered acceptable by the American Veterinary Medical Association (AVMA) for wild birds (AVMA 2007). The number of starlings lethally taken by WS using DRC-1339 was estimated based on bait consumption in FY 2003.

Table 4 – Number of birds dispersed and taken in New Jersey by WS during FY 2003

Species	Dispersed	Take	Species	Dispersed	Take
Great Blue Heron	1	0	**Great Black-backed Gull**	5	1
Turkey Vulture	19	0	**Gull (unknown)**	13	0
Mallard	12	0	**Rock Pigeon**	0	29
Northern Harrier	22	0	**Mourning Dove**	102	5
Red-tailed Hawk	8	0	**American Crow**	354	0
American Kestrel	8	0	**Horned Lark**	115	0
Hawks (other)*	6	0	**Tree Swallow**	170	0
Killdeer	26	3	**European Starling**	12,058	708
Plovers (other)*	390	0	**Red-winged Blackbird**	7	1
Shorebirds (other)*	11	0	**Eastern Meadowlark**	4	0
Laughing Gull	10,739	100	**Brown-headed Cowbird**	35	0
Ring-billed Gull	404	5	**House Sparrow**	0	3
Herring Gull	409	1	**TOTAL**	**24,918**	**856**

*WS information management system in FY 2003 did not have a species entry for recording all bird species addressed by WS.

Requests for use of lethal methods to address starling damage and threats arose primarily from the damage that accumulations of fecal dropping pose to property and the threats posed by large accumulations of droppings under areas where the birds roost and loaf. Accumulations of fecal droppings are aesthetically displeasing and pose risks of disease transmission in areas of public-use and areas where storage of food-grade components occurs. Large groups of starlings can also pose strike hazards to aircraft when nesting, roosting, and loafing occurs near airports.

Table 5 – WS' take of bird species in New Jersey by method during FY 2003

SPECIES	METHOD				TOTAL
	Firearm	Trap	DRC-1339	Other[a]	
Killdeer	3	0	0	0	**3**
Laughing Gull	100	0	0	0	**100**
Ring-billed Gull	5	0	0	0	**5**
Herring Gull	1	0	0	0	**1**
Great Black-backed Gull	1	0	0	0	**1**
Rock Pigeon	29	0	0	0	**29**
Mourning Dove	5	0	0	0	**5**
European Starling	78	309	201	120	**708**
Red-winged Blackbird	0	0	0	1	**1**
House Sparrow	0	0	0	3	**3**

[a]Other methods could include non-chemical methods such as hand-capture, mist net, and/or cannon net. All methods employed were discussed in Appendix B of the EA.

Many of the birds taken using lethal methods occurred at the request of airport authorities to reduce risks of aircraft striking birds which can cause damage to the aircraft and threaten passenger safety. Many of the species of birds addressed at airports occur during the spring and fall migrations of those species when

large flocks pose threats to aircraft. Lethal methods were employed to reinforce non-lethal methods to decrease habituation and to remove those birds identified as posing an immediate or chronic threat to aircraft. WS continued to work with airports in New Jersey to identify attractants to birds on airport properties and to reduce threats of aircraft being struck by birds. All take by WS in New Jersey occurred pursuant to the MBTA through the issuance of depredation permits by the USFWS or through depredation orders which allow take when damage is occurring or about to occur without the need for a depredation permit. WS' take of birds is reported to the USFWS annually to ensure WS' take is considered as part of management objectives for those species.

WS addressed a total of 25,774 birds in FY 2003 that were identified as causing damage or posing threats to agricultural resources, natural resources, and property, and posing threats to human safety in New Jersey using an integrated approach (both non-lethal and lethal methods) as described in the proposed action. Nearly 97% of those birds addressed were non-lethally harassed and dispersed from areas where damages or threats were occurring.

Bird Damage Management Conducted in New Jersey by WS during FY 2004

WS continued to provide technical assistance and direct operational damage management to those persons requesting assistance in FY 2004. Technical assistance was provided through the recommendation of bird damage management techniques, assistance with wildlife identification, and with the identification of bird damage. Table 6 provides the number of technical assistance projects conducted in New Jersey by WS during FY 2004. As shown in Table 6, WS conducted 98 technical assistance projects in FY 2004 involving damage to agricultural resources, natural resources, property, and threats to human safety. Nearly 44% of the technical assistance projects conducted by WS in FY 2004 involved bird damage to property, primarily caused by turkey vultures. In addition, nearly 42% of the technical assistance projects conducted by WS involved damage to agricultural resources in FY 2004, primarily caused by European starlings. WS received 23 requests for technical assistance involving turkey vultures in FY 2004, which was the highest of all bird species.

WS provided technical assistance on resolving and preventing damage involving at least 19 species of birds in FY 2004. Over 60% of the requests for technical assistance involved damage or threats associated with vultures, European starlings, and gulls. Many of the requests for assistance involved damage to multiple resources. For example, starlings can pose a threat to property from damage that occurs when an aircraft strikes a starling or multiple starlings which can also threaten human safety if catastrophic failure of the aircraft occurs after the strike. Over 28% of the requests for assistance involved damage or threats associated with non-native bird species during FY 2004.

Bird species addressed in New Jersey by WS during direct operational assistance are shown in Table 7. WS addressed at least 26 species of birds during operational assistance in New Jersey during FY 2004. Of those birds addressed in FY 2004, gulls were most often addressed, primarily laughing gulls. WS continued to employ an integrated approach to managing damage and threats associated with birds in FY 2004. The integrated approach employed by WS incorporates multiple methods simultaneously or consecutively to most effectively reduce damage and threats. Methods employed to reduce those threats are discussed in detail in the EA (USDA 2003). Methods employed by WS can be classified into non-lethal and lethal methods and were used often in combination to reduce damage and threats. Methods used to non-lethally harass and disperse birds were primarily audio deterrents, such as pyrotechnics, that simulate the noise produced by lethal methods. A total of 16,348 birds were addressed using non-lethal methods to alleviate damage or reduce threats in FY 2004. At least 25 species of birds were non-lethally harassed or dispersed in New Jersey during FY 2004. Of the total number of birds addressed in FY 2004, nearly 96% were non-lethally dispersed or harassed to alleviate damage or to reduce threats in the State. WS used non-lethal methods to address over 14,000 laughing gulls in FY 2004.

Table 6 – WS' technical assistance projects conducted in New Jersey during FY 2004 by species and resource

Species	Resource[a]				Total	Species	Resource				Total
	A	N	P	H			A	N	P	H	
Double-crested Cormorant	2	2	0	0	**4**	**Osprey**	0	0	1	0	**1**
Great Blue Heron	4	2	0	0	**6**	**Wild Turkey**	0	0	0	1	**1**
Great Egret	1	0	0	0	**1**	**Laughing Gull**	3	0	1	0	**4**
Snowy Egret	2	0	0	1	**3**	**Ring-billed Gull**	2	0	0	0	**2**
Black Vulture	4	0	1	0	**5**	**Herring Gull**	2	2	0	3	**7**
Turkey Vulture	2	0	21	0	**23**	**Rock Pigeon**	0	0	6	0	**6**
Mute Swan	0	1	1	0	**2**	**Downy Woodpecker**	0	0	2	0	**2**
Tundra Swan	1	0	0	1	**2**	**Woodpecker**	0	0	3	0	**3**
Mallard	0	0	3	1	**4**	**European Starling**	16	0	2	0	**18**
Snow Goose	2	0	0	0	**2**	**Feral Geese**	0	0	2	0	**2**
						TOTAL	**41**	**7**	**43**	**7**	**98**

[a]A=Agricultural Resources, N=Natural Resource, P=Property, H=Human Safety

To reinforce non-lethal methods, WS employed lethal methods that resulted in the take of target bird species. Lethal take occurred primarily using a firearm which reinforces the noise produced by non-lethal methods (see Table 8). European starlings and laughing gulls were the two species with the highest take levels in FY 2004. Those two species comprised nearly 99% of the lethal take of birds in New Jersey during FY 2004. Of the laughing gulls addressed, over 98% were non-lethally harassed using auditory dispersal techniques. Laughing gulls were primarily addressed by WS to alleviate threats of aircraft strikes at airports. Starlings are considered an invasive species in the United States that compete with native species for nesting sites and food resources. Starlings are a gregarious species which can increase hazards to aircraft at airports and pose threats of disease transmission where fecal matter accumulates under roosts. Starlings are afforded no protection under the MBTA.

Table 7 – Number of birds dispersed and taken in New Jersey by WS during FY 2004

Species	Dispersed	Take	Species	Dispersed	Take
Double-crested Cormorant	40	0	**Laughing Gull**	14,246	260
Great Blue Heron	2	0	**Ring-billed Gull**	121	0
Black Vulture	215	7	**Herring Gull**	420	0
Turkey Vulture	315	0	**Great Black-backed Gull**	7	0
Mallard	7	0	**Common Tern**	2	0
Northern Harrier	39	0	**Rock Pigeon**	0	1
Red-tailed Hawk	5	0	**Mourning Dove**	2	0
American Kestrel	7	0	**American Crow**	17	0
Hawks (other)*	8	0	**Horned Lark**	10	0
Killdeer	45	2	**Barn Swallow**	26	0
Greater Yellowlegs	7	0	**European Starling**	410	431
Plovers (other)*	237	0	**Red-winged Blackbird**	40	0
Shorebirds (other)*	80	0	**Brown-headed Cowbird**	40	0
			TOTAL	**16,348**	**701**

*WS information management system in FY 2004 did not have a species entry for recording all bird species addressed by WS.

In addition to the lethal take of starlings and laughing gulls, WS also employed firearms to lethally take seven black vultures, two killdeer, and one pigeon to alleviate damage and threats. Requests for direct operational assistance received by WS in FY 2004 to alleviate damage and threats associated with black

vultures were to reduce damages occurring primarily to property. Killdeer were lethally taken to reduce strike risks at airports in the State. The pigeon was removed to alleviate human safety concerns.

Table 8 – WS' take of bird species in New Jersey by method during FY 2004

SPECIES	METHOD			TOTAL
	Firearm	DRC-1339	Other[a]	
Black Vulture	7	0	0	**7**
Killdeer	2	0	0	**2**
Laughing Gull	260	0	0	**260**
Rock Pigeon	1	0	0	**1**
European Starling	4	426	1	**431**

[a]Other methods could include non-chemical methods such as hand-capture, mist net, and/or cannon net. All methods employed were discussed in Appendix B of the EA.

All take of native bird species was conducted under a depredation permit issued by the USFWS or a depredation order pursuant to the MBTA. WS used the avicide DRC-1339 to take 426 starlings in FY 2004. Appendix B in the EA (USDA 2003) contains a detailed description of the methods available for use to resolve bird damage in New Jersey, including the avicide DRC-1339 employed in FY 2004 by WS.

Bird Damage Management Conducted in New Jersey by WS during FY 2005

WS' activities continued in FY 2005 with the use of an integrated approach to managing bird damage and threats. WS provided both technical assistance and direct operational management in FY 2005. Similar to FY 2004, WS continued to provide technical assistance through bird identification, through the identification of bird damage, and by demonstrating the proper use of methods to alleviate damage and threats associated with birds (see Table 9). Direct operational management was provided by WS through the use of those methods described in Appendix B of the EA to alleviate damage or reduce threats in the State. WS verified or those requesting assistance reported nearly $147,225 in damage associated with birds in New Jersey during FY 2005.

During FY 2005, WS received requests for technical assistance involving at least 27 different bird species in the State. In total, WS conducted 143 technical assistance projects in FY 2005 in the State. Nearly 61% of the requests for technical assistance received by WS during FY 2005 involved bird damage to property. Damage to property associated with vultures represented over 47% of the requests for assistance to alleviate bird damage to property. Of the technical assistance requests received by WS, turkey vultures and black vultures accounted for over 32% of the total which was the highest of any other bird species.

Damage to agricultural resources and threats to human safety associated with birds represented nearly 32% of the 143 technical assistance projects conducted in FY 2005. Requests for assistance to alleviate damage and threats to agricultural resources that were received by WS occurred primarily from snow geese and European starlings. Damage to agricultural resources associated with snow geese occurs from consumption of sprouting crops during their spring migration. Large flocks of snow geese can cause considerable damage when consuming sprouting crops. Damage associated with European starlings to agricultural resources occurs from the consumption of livestock feed, the contamination of livestock feed from fecal droppings, and the possibility of transmitting diseases to livestock from accumulation of fecal droppings in feed and water supplies.

Technical assistance requests received involving natural resources were primarily from the gregarious feeding and nesting behavior associated with colonial waterbirds. Requests for technical assistance

received by WS to alleviate damage and threats to natural resources were associated with double-crested cormorants, great blue herons, mute swans, and gulls. Damages associated with cormorants, herons, and gulls occur from feeding on fish, from the loss of habitat associated with fecal accumulations under nesting sites, the aggressive and gregarious nesting behavior of those species which often prevents other native bird species from nesting in those locations, and feeding on eggs and chicks of other colonial nesters.

WS continued to receive requests for direct operational assistance in which WS was directly involved with employing methods to alleviate damage and threats. As described in the proposed action, WS continued to employ methods in an integrated approach to address damage in FY 2005. WS employed both lethal and non-lethal methods which were described in Appendix B of the EA (USDA 2003). As shown in Table 10, WS addressed 10,316 birds in New Jersey during FY 2005 to alleviate damage and threats.

Table 9 – Technical assistance projects conducted by WS during FY 2005 by species and resource

Species	Resource[a]				Total	Species	Resource				Total
	A	N	P	H			A	N	P	H	
Double-crested Cormorant	0	2	0	0	**2**	**Great Black-backed Gull**	0	0	2	0	**2**
Great Blue Heron	1	2	0	0	**3**	**Tern (other)***	0	0	1	0	**1**
Black Vulture	1	0	15	2	**18**	**Rock Pigeon**	1	0	4	0	**5**
Turkey Vulture	0	0	26	1	**27**	**Monk Parakeet**	0	0	2	1	**3**
Snow Goose	9	0	0	0	**9**	**Downy Woodpecker**	0	0	1	0	**1**
Mute Swan	0	1	2	4	**7**	**Northern Flicker**	0	0	1	0	**1**
Tundra Swan	1	0	0	0	**1**	**American Crow**	0	0	6	6	**12**
Mallard	0	0	11	1	**12**	**American Robin**	0	0	0	1	**1**
Cooper's Hawk	0	0	1	0	**1**	**European Starling**	9	0	0	0	**9**
Red-tailed Hawk	0	0	1	0	**1**	**Red-winged Blackbird**	1	0	0	0	**1**
Wild Turkey	0	0	0	1	**1**	**Common Grackle**	1	0	2	1	**4**
Laughing Gull	2	0	5	0	**7**	**Feral Goose**	0	0	1	2	**3**
Ring-billed Gull	0	2	2	0	**4**	**Guinea Fowl**	0	0	0	1	**1**
Herring Gull	0	2	3	0	**5**	**Bird (Unidentifiable)**	0	0	1	0	**1**
						TOTAL	**26**	**9**	**87**	**21**	**143**

[a]A=Agricultural Resources, N=Natural Resource, P=Property, H=Human Safety

*WS information management system in FY 2005 did not have a species entry for recording all bird species addressed by WS.

WS employed lethal methods to take a total of 213 birds during FY 2005 to alleviate damage and threats. Over 49% of the birds lethally taken in FY 2005 were European starlings which are a non-native species in New Jersey. Starlings were taken using DRC-1339 and firearms by WS in FY 2005 (see Table 11). Starlings were primarily taken to alleviate damage to agricultural resources from the consumption of livestock feed and the contamination of livestock feed and water from fecal droppings. Of those birds lethally taken by WS, nearly 43% were laughing gulls to alleviate damage primarily to property. Gulls were lethally taken by WS using firearms in FY 2005. In addition, WS employed lethal methods to take five black vultures, four turkey vultures, five brown-headed cowbirds, and three house sparrows. Similar to previous years, vultures were lethally taken to alleviate damage to property. Vultures can roost and loaf in areas of human activity, including on the tops of residential houses. Vultures are known to tear shingles from roofs, pull caulking around windows, and their droppings can cause damage to houses and vehicles from the acid present in bird feces. House sparrows and brown-headed cowbirds were taken by WS at the request of resource managers to alleviate damage to property.

Table 10 – Birds dispersed and taken by WS in New Jersey during FY 2005.

Species	Dispersed	Take	Species	Dispersed	Take
Black Vulture	202	5	**Laughing Gull**	8,485	91
Turkey Vulture	636	4	**Ring-billed Gull**	84	0
American Black Duck	5	0	**Herring Gull**	5	0
Mallard	35	0	**Common Tern**	1	0
Northern Harrier	12	0	**Horned Lark**	1	0
Red-tailed Hawk	3	0	**Tree Swallow**	50	0
American Kestrel	2	0	**European Starling**	500	105
Rough-legged Hawk	4	0	**Brown-headed Cowbird**	40	5
Killdeer	6	0	**House Sparrow**	0	3
Plovers (other)*	30	0	**Feral Geese**	2	0
			TOTAL	**10,103**	**213**

*WS information management system in FY 2005 did not have a species entry for recording all bird species addressed by WS.

Lethal take of birds occurred primarily with firearms which is a highly selective method since identification of the target occurs prior to application. Of the species lethally taken in FY 2005 by WS, all take occurred using firearms except for the take of 80 starlings using DRC-1339 and three house sparrows taken using nets. All take of birds by WS in New Jersey occurred pursuant to the MBTA.

Table 11 - WS' take of bird species in New Jersey by method during FY 2005

SPECIES	METHOD			TOTAL
	Firearm	DRC-1339	Other[a]	
Black Vulture	5	0	0	**5**
Turkey Vulture	4	0	0	**4**
Laughing Gull	91	0	0	**91**
European Starling	25	80	0	**105**
Brown-headed Cowbird	5	0	0	**5**
House Sparrow	0	0	3	**3**

[a]Other methods could include non-chemical methods such as hand-capture, mist net, and/or cannon net. All methods employed were discussed in Appendix B of the EA.

Similar to previous years, WS continued to address damage and threats associated with birds using primarily non-lethal harassment methods to disperse birds from areas where damage or threats were occurring. At least 19 species of birds were addressed by WS using non-lethal methods in FY 2005. During FY 2005, WS dispersed 10,103 birds in the State using non-lethal methods, primarily pyrotechnics and other auditory deterrents. Of the 10,103 birds addressed using non-lethal methods, nearly 84% were laughing gulls. Nearly 98% of the birds addressed by WS in New Jersey during FY 2005 were non-lethally dispersed using harassment methods. Of those bird species in which lethal take also occurred, over 98% of the birds addressed were dispersed using non-lethal methods. WS addressed 8,576 laughing gulls in FY 2005 of which 8,485 were dispersed using non-lethal methods. WS continued to apply an integrated approach to managing bird damage during FY 2005.

Bird Damage Management Conducted in New Jersey by WS during FY 2006

WS' bird damage management activities in FY 2006 were similar to the implementation of the proposed action in previous years. WS continued to provide both technical assistance and direct operational assistance to those requesting assistance. WS provided technical assistance on resolving damage caused by at least 26 species of birds in FY 2006 (see Table 12).

WS conducted a total of 173 technical assistance projects in FY 2006. WS conducted 57 technical assistance projects involving turkey vultures which were the highest number of projects for any bird species. WS conducted 86 technical assistance projects involving black vultures and turkey vultures during FY 2006 in New Jersey compared to 28 technical assistance projects conducted for vultures in FY 2004 and 45 projects in FY 2005. WS verified or cooperators reported bird damage to property, agricultural resources, and natural resources totaling $42,445 in FY 2006 primarily to agricultural resources and property.

WS continued to provide direct operational assistance in New Jersey during FY 2006 to those requesting assistance with reducing or preventing damage caused by at least 19 species of birds. The number of species addressed using direct operational assistance was similar to the number of species addressed in FY 2005. WS continued to employ an integrated damage management program as described in the EA during FY 2006.

WS continued to employ lethal methods that resulted in the take of 890 birds in New Jersey during FY 2006 (see Table 13). Over 91% of those birds lethally taken were starlings and laughing gulls. Of the laughing gulls addressed in FY 2006, nearly 97% were non-lethally dispersed using non-lethal methods. As shown in Table 14, WS' lethal take of birds occurred primarily from the use of firearms and live-traps in FY 2006 to alleviate damages and threats. Starlings were the primary species lethally taken by WS in the State during FY 2006. A total of 553 starlings were captured in live-traps and subsequently euthanized by carbon dioxide or cervical dislocation. No chemical methods were used by WS during bird damage management activities in the State during FY 2006.

Table 12 – Technical assistance projects conducted by WS during FY 2006 by species and resource

Species	Resource[a]				Total	Species	Resource				Total
	A	N	P	H			A	N	P	H	
Double-crested Cormorant	0	1	0	0	**1**	**Great Black-backed Gull**	0	1	0	0	**1**
Great Blue Heron	0	3	0	0	**3**	**Rock Pigeon**	2	0	5	2	**9**
Yellow-crowned Night Heron	0	0	1	0	**1**	**Mourning Dove**	0	0	0	1	**1**
Black Vulture	2	0	17	7	**26**	**Northern Flicker**	0	0	0	1	**1**
Turkey Vulture	2	0	42	13	**57**	**Woodpecker (unknown)**	0	0	1	0	**1**
Vultures (mixed)	0	0	0	3	**3**	**American Crow**	0	0	0	1	**1**
Tundra Swan	1	0	0	0	**1**	**American Robin**	0	0	0	1	**1**
Mallard	0	0	8	2	**10**	**Northern Mockingbird**	0	0	0	4	**4**
Duck (unknown)	0	0	1	0	**1**	**European Starling**	1	0	1	7	**9**
Snow Goose	3	0	0	0	**3**	**Blackbirds (mixed)**	0	0	3	0	**3**
Red-tailed Hawk	0	0	1	0	**1**	**House Sparrow**	0	0	0	2	**2**
Wild Turkey	0	0	1	4	**5**	**Monk Parakeet**	0	0	1	0	**1**
Laughing Gull	2	1	2	2	**7**	**Feral Duck**	0	0	5	1	**6**
Ring-billed Gull	0	1	1	0	**2**	**Feral Goose**	0	0	1	2	**3**
Exotic bird (unknown species)	0	0	0	1	**1**	**Egrets/herons/cormorants (mixed)**	0	0	1	0	**1**
Herring Gull	0	2	3	2	**7**	**TOTAL**	**13**	**9**	**95**	**56**	**173**

[a]A=agricultural resources, N=Natural Resources, P=Property, H=Human Safety

The use of firearms reinforces the noise produced by non-lethal methods such as pyrotechnics and propane cannons. Without reinforcement, birds often habituate to the noise produced by non-lethal methods and begin to ignore the application of those methods. Firearms are selective for target species and the noise associated with the discharge of a firearm also effectively disperses birds during application. Firearms are also effective at targeting birds that are habitually identified as causing damage or posing a threat to human safety. Live-traps are also selective for target species since non-targets can be released

unharmed. In FY 2006, WS employed live-traps to capture European starlings, red-winged blackbirds, and house sparrows. Target bird species that were live-captured were euthanized using cervical dislocation or carbon dioxide which are methods considered appropriate by the AVMA for wild birds (AVMA 2007).

Table 13 – Birds dispersed and taken by WS in New Jersey during FY 2006.

Species	Dispersed	Take	Species	Dispersed	Take
Black Vulture	50	7	**Upland Sandpipers**	1	0
Turkey Vulture	251	11	**Laughing Gull**	7,635	256
Northern Harrier	25	0	**Ring-billed Gull**	21	0
Red-tailed Hawk	10	0	**Herring Gull**	777	1
American Kestrel	1	0	**Rock Pigeon**	2	0
Rough-legged Hawk	2	0	**American Crow**	5	0
Falcon (unknown)	1	0	**Tree Swallow**	0	20
Hawks (unknown)	1	0	**European Starling**	341	554
Wild Turkey	11	0	**Red-winged Blackbird**	0	27
Killdeer	12	7	**House Sparrow**	0	7
Plovers (other)*	81	0	**TOTAL**	**9,227**	**890**

*WS information management system in FY 2006 did not have a species entry for recording all bird species addressed by WS.

As part of the integrated approach to managing damage and threats, WS also employed non-lethal harassment techniques to disperse 9,227 birds in the State. At least 16 species of birds were addressed using non-lethal methods during FY 2006. Over 91% of the birds addressed in New Jersey during FY 2006 were non-lethally harassed using primarily pyrotechnics. Similar to FY 2005, laughing gulls were the primary species addressed during direct operational assistance by WS. WS employed non-lethal methods to disperse 7,635 laughing gulls in the State to alleviate damage and threats. In addition, WS dispersed 21 ring-billed gulls and 777 herring gulls to alleviate damage and threats in the State. Only on herring gull was lethally taken by WS during FY 2006 and no ring-billed gulls were lethally taken.

Table 14 - WS' take of bird species in New Jersey during FY 2006 by method

SPECIES	METHOD			TOTAL
	Firearm	Traps	Other[a]	
Black Vulture	7	0	0	**7**
Turkey Vulture	11	0	0	**11**
Killdeer	7	0	0	**7**
Laughing Gull	256	0	0	**256**
Herring Gull	1	0	0	**1**
Tree Swallow	20	0	0	**20**
European Starling	0	553	1	**554**
Red-winged Blackbird	17	10	0	**27**
House Sparrow	0	4	3	**7**

[a]Other methods could include non-chemical methods such as hand-capture, mist net, and/or cannon net. All methods employed were discussed in Appendix B of the EA.

All take of birds by WS in FY 2006 occurred pursuant to the MBTA and only after a request for assistance was received by WS. All methods employed by WS in FY 2006 were discussed in Appendix B of the EA (USDA 2003). WS continued to address requests for assistance to alleviate damage and threats using lethal and non-lethal methods in an integrated approach described in the EA.

Bird Damage Management Conducted in New Jersey by WS during FY 2007

As described in detail in the EA, WS continued to provide technical assistance and direct operational damage management to those requesting assistance with managing damage caused by birds during FY 2007. WS continued to receive requests for assistance with several bird species in New Jersey. WS received requests for technical assistance involving at least 28 species of birds in FY 2007 while requests for direct operational assistance by WS involved at least 20 species of birds. Requests for technical assistance received by WS during FY 2007 are shown in Table 15 by resource category.

A total of 147 technical assistance projects were conducted by WS in New Jersey during FY 2007. Similar to FY 2006, the highest number of technical assistance projects conducted by WS in FY 2007 involved damage management associated with turkey vultures. WS conducted 47 technical assistance projects involving vultures in FY 2007. WS verified or those requesting assistance reported $203,692 in damages to agricultural resources and property in FY 2007.

WS continued to receive requests to conduct direct operational assistance in FY 2007 involving damage and threats associated with birds in the State. WS addressed at least 20 bird species during direct operational assistance activities in FY 2007 (see Table 16). Similar to previous years, European starlings and laughing gulls were the two bird species most often addressed. WS addressed nearly 6,700 laughing gulls in FY 2007 using non-lethal dispersal methods. WS also employed pyrotechnics and other noise producing methods to disperse 235 ring-billed gulls, 298 herring gulls, and 206 Bonaparte's gulls in FY 2007. Overall, WS dispersed 8,124 birds in FY 2007 using non-lethal harassment methods, primarily pyrotechnics and other noise producing methods. WS also used lethal methods to take 1,447 birds in FY 2007.

Table 15 – Technical assistance projects conducted by WS during FY 2007 by species and resource

Species	Resource[a]				Total	Species	Resource				Total
	A	N	P	H			A	N	P	H	
Double-crested Cormorant	0	1	2	1	**4**	**Herring Gull**	0	1	4	3	**8**
Great Blue Heron	0	4	0	1	**5**	**Great Black-backed Gull**	0	1	4	0	**5**
Yellow-crowned Night Heron	0	0	0	2	**2**	**Rock Pigeon**	1	0	1	1	**3**
Black Vulture	3	0	8	3	**14**	**Northern Flicker**	0	0	1	0	**1**
Turkey Vulture	1	0	30	2	**33**	**Downy Woodpecker**	0	0	5	0	**5**
Atlantic Brant	0	0	1	0	**1**	**American Robin**	0	0	2	1	**3**
Snow Goose	2	0	0	0	**2**	**Northern Mockingbird**	0	0	0	1	**1**
Mute Swan	0	0	1	4	**5**	**European Starling**	6	0	1	4	**11**
Mallard	0	0	8	7	**15**	**Cedar Waxwing**	0	0	0	1	**1**
Osprey	0	0	1	0	**1**	**Red-winged Blackbird**	0	0	0	2	**2**
Bald Eagle	0	0	1	0	**1**	**Common Grackle**	0	0	0	1	**1**
Wild Turkey	0	0	2	1	**3**	**House Finch**	0	0	0	1	**1**
Laughing Gull	6	1	1	2	**10**	**House Sparrow**	0	0	0	1	**1**
Ring-billed Gull	0	1	4	2	**7**	**Feral Duck**	0	0	0	1	**1**
						TOTAL	**19**	**9**	**77**	**42**	**147**

[a]A=agricultural resources, N=Natural Resources, P=Property, H=Human Safety

In FY 2007, WS used lethal methods to take 435 laughing gulls and 978 European starlings to alleviate damage and reduce threats which accounted for nearly 98% of the birds taken by WS in FY 2007. Starlings are considered a non-native species in New Jersey that are closely associated with human activities and often compete with native species for food and nesting habitat. Mourning doves continued to pose threats to aircraft at several airports in New Jersey during their migration in FY 2007. To reduce

threats of aircraft strikes, WS employed an integrated approach to resolving those threats that included dispersing 210 doves and lethally removing eight doves. Of the doves addressed by WS in FY 2007, 96% were dispersed from airfields using non-lethal harassment methods. Over 68% of the birds lethally taken by WS in FY 2007 were non-native bird species in New Jersey.

Table 16 – Birds dispersed and taken by WS in New Jersey during FY 2007.

Species	Dispersed	Take	Species	Dispersed	Take
Turkey Vulture	53	0	**Herring Gull**	298	1
Northern Harrier	9	0	**Bonaparte's Gull**	206	0
Red-tailed Hawk	10	0	**Common Tern**	1	0
American Kestrel	3	0	**Mourning Dove**	210	8
Rough-legged Hawk	1	0	**Horned Lark**	10	0
Wild Turkey	7	0	**Barn Swallow**	60	0
Killdeer	2	10	**European Starling**	174	978
Black-bellied Plovers	163	0	**Red-winged Blackbird**	8	3
Laughing Gull	6,674	435	**Common Grackle**	0	1
Ring-billed Gull	235	0	**House Sparrow**	0	11
			TOTAL	**8,124**	**1,447**

Table 17 contains the take of birds by methods that occurred during damage management activities to resolve requests for assistance in FY 2007. Similar to previous years, firearms and live-traps were the primary methods used to lethally take birds in New Jersey. Firearms are selective for target species since targets are identified prior to application. WS also employed live-traps to capture 816 starlings and two red-winged blackbirds in FY 2007. Live-captured birds were euthanized using cervical dislocation or carbon dioxide. Chemical methods employed included the use of DRC-1339 which resulted in the take of 147 starlings.

Table 17 - WS' take of bird species in New Jersey during FY 2007 by method

SPECIES	METHOD				TOTAL
	Firearm	Traps	DRC-1339	Other[a]	
Killdeer	10	0	0	0	**10**
Laughing Gull	435	0	0	0	**435**
Herring Gull	1	0	0	0	**1**
Mourning Dove	8	0	0	0	**8**
European Starling	14	816	147	1	**978**
Red-winged Blackbird	1	2	0	0	**3**
Common Grackle	1	0	0	0	**1**
House Sparrow	0	0	0	11	**11**

[a]Other methods could include non-chemical methods such as hand-capture, mist net, and/or cannon net. All methods employed were discussed in Appendix B of the EA.

WS continued to employ methods in an integrated approach to resolving bird damage and threats in the State. WS continued to employ primarily non-lethal methods to address requests for bird damage management in the State. Of the 9,571 birds addressed by WS in FY 2007, nearly 85% were addressed using non-lethal methods. Over 68% of the birds addressed using lethal methods were non-native species in New Jersey. Similar to previous years, requests for assistance were received primarily to alleviate damage to property in FY 2007. All take of birds in FY 2007 by WS occurred pursuant to the MBTA.

Bird Damage Management Conducted in New Jersey by WS during FY 2008

During FY 2008, WS continued to receive and respond to requests for assistance to manage damage associated with birds in the State. To address those requests for assistance, WS continued to provide both technical assistance and operational assistance. Technical assistance provides those seeking assistance with information on damage identification, bird identification, available methods, and how to employ available methods to resolve or prevent damage. Operational assistance involves the direct application of methods and techniques by WS to alleviate damage caused by birds when a request for such assistance is received. Those persons requesting assistance reported to WS or WS verified damage associated with birds totaling $207,825 in FY 2008. Similar to previous years, monetary damages associated with birds that were reported to WS or were verified by WS occurred primarily to agricultural resources and property during FY 2008.

WS conducted 205 technical assistance projects in New Jersey involving requests to alleviate damage and threats associated with birds during FY 2008 (see Table 18). The number of requests for technical assistance for bird damage management in FY 2008 increased over 113% compared to the number of technical assistance projects conducted by WS in FY 2003. Compared to FY 2007, the number of technical assistance projects conducted by WS increased over 39% in FY 2008. WS received requests for damage management assistance involving at least 39 species of birds in FY 2008 compared to 23 bird species addressed in FY 2003.

Table 18 – Technical assistance projects conducted by WS during FY 2008 by species and resource

Species	Resource[a]				Total	Species	Resource				Total
	A	N	P	H			A	N	P	H	
Double-crested Cormorant	0	1	1	0	**2**	**Red-headed Woodpecker**	0	0	2	0	**2**
Great Blue Heron	0	2	0	0	**2**	**Downy Woodpecker**	0	0	6	0	**6**
Black Vulture	5	1	13	4	**23**	**Hairy Woodpecker**	0	0	1	0	**1**
Turkey Vulture	0	0	26	7	**33**	**Blue Jay**	0	0	0	1	**1**
Mute Swan	0	0	0	4	**4**	**American Crow**	0	0	0	3	**3**
Tundra Swan	4	0	0	0	**4**	**Tree Swallow**	0	0	0	1	**1**
Snow Goose	4	0	0	0	**4**	**Barn Swallow**	0	0	1	1	**2**
Mallard	0	1	6	3	**10**	**American Robin**	0	0	2	4	**6**
Common Merganser	0	0	0	1	**1**	**Northern Mockingbird**	0	0	0	1	**1**
Osprey	0	0	1	0	**1**	**European Starling**	6	0	2	3	**11**
Red-tailed Hawk	0	0	1	0	**1**	**Northern Cardinal**	0	0	0	1	**1**
Peregrine Falcon	0	0	0	1	**1**	**Red-winged Blackbird**	0	0	0	1	**1**
Wild Turkey	0	0	3	3	**6**	**Common Grackle**	0	0	1	1	**2**
Quail*	0	0	0	1	**1**	**Brown-headed Cowbird**	0	0	0	2	**2**
Laughing Gull	4	1	3	5	**13**	**Blackbird (mixed)**	0	0	1	3	**4**
Ring-billed Gull	0	1	3	2	**6**	**Purple Finch**	0	0	0	1	**1**
Herring Gull	0	1	6	7	**14**	**House Sparrow**	2	0	0	5	**7**
Great Black-backed Gull	0	1	4	0	**5**	**Feral Goose**	0	0	1	2	**3**
Rock Pigeon	2	0	1	3	**6**	**Feral Duck**	0	0	3	4	**7**
Mourning Dove	0	0	0	1	**1**	**Bird (unidentifiable)**	0	0	3	1	**4**
Monk Parakeet	0	0	0	1	**1**	**TOTAL**	**27**	**9**	**91**	**78**	**205**

[a]A=agricultural resources, N=Natural Resources, P=Property, H=Human Safety

*WS information management system in FY 2008 did not have a species entry for recording all bird species addressed by WS.

Similar to previous years, requests for technical assistance were received primarily to reduce damage and threats to property associated with birds. WS conducted 91 technical assistance projects involving bird

damage or threats to property in FY 2008, primarily associated with vultures. WS also conducted 78 technical assistance projects involving threats to human safety. Technical assistance projects often involve damage or threats of damage to multiple resources (*e.g.*, gulls can pose a threat of damage to property from being struck by aircraft which could also threaten human safety). In FY 2008, WS conducted 27 technical assistance projects involving damage to agricultural resources associated with black vultures, tundra swans, snow geese, laughing gulls, rock pigeons, starlings, and house sparrows. Technical assistance was also provided to those seeking assistance with resolving damage to natural resources in the State associated with cormorants, great blue herons, black vultures, mallards, and gulls.

When requested, WS also provided direct operational assistance through the direct employment of methods to resolve damage and threats in the State. As shown in Table 19, WS continued to employ both lethal and non-lethal methods to resolve requests for direct operational assistance in an integrated approach. WS employed pyrotechnics and other auditory deterrents to disperse birds from areas where damage or threats were occurring. WS also employed firearms, live-traps, DRC-1339, and nets to lethally take birds as part of an integrated approach (see Table 20). WS also destroyed 13 feral duck eggs and 133 feral goose eggs in FY 2008 to discourage nesting by feral waterfowl in areas where damage and/or threats were occurring.

In FY 2008, WS employed lethal methods to take 2,765 birds in the State to alleviate damage and reduce threats of damage. WS' lethal take of 2,371 starlings in FY 2008 accounted for nearly 86% of the birds lethally taken in the State by WS. Of those birds lethally taken by WS in FY 2008, over 88% were non-native species in New Jersey. To reduce threats of damage to property, WS lethally removed 198 laughing gulls in the area where threats were occurring. Killdeer, mourning doves, red-winged blackbirds, a herring gull, and a wild turkey were lethally taken in FY 2008 to alleviate threats to property and human safety at airports. Mallards and feral waterfowl were lethally taken to alleviate property damage from feeding activities and to reduce accumulations of fecal droppings in public-use areas which were aesthetically displeasing. Fecal droppings can also pose a threat to human safety from the possibility of disease transmission. American crows were addressed to disperse a roost in an area where fecal droppings were accumulating. The fecal droppings were aesthetically displeasing to the property owner and posed a threat to human safety through the possibility of disease transmission from encountering fecal matter. A house sparrow was also removed by WS to alleviate property damage in FY 2008.

Table 19 – Birds dispersed and taken by WS in New Jersey during FY 2008

Species	Dispersed	Take	Species	Dispersed	Take
Black Vulture	75	1	**Herring Gull**	102	1
Turkey Vulture	136	6	**Mourning Dove**	35	83
Mallard	30	11	**American Crow**	54	2
Northern Harrier	7	0	**Purple Martin**	9	0
Red-tailed Hawk	1	0	**Tree Swallow**	9	0
Rough-legged Hawk	1	0	**European Starling**	232	2,371
American Kestrel	3	0	**Red-winged Blackbird**	0	5
Wild Turkey	4	1	**Brown-headed Cowbird**	30	0
Killdeer	10	18	**House Sparrow**	0	1
Black-bellied Plover	131	0	**Feral Goose**	0	37
Laughing Gull	1,993	198	**Feral Duck**	0	30
Ring-billed Gull	131	0	**TOTAL**	**2,993**	**2,765**

Lethal take of birds by WS occurred primarily through the use of firearms, except for the take of starlings which occurred primarily from the use of DRC-1339. Those target bird species live-captured in traps by

WS during FY 2008 were euthanized by cervical dislocation or carbon dioxide which are methods of euthanasia considered appropriate by the AVMA for free-ranging birds (AVMA 2007). All lethal take of birds by WS in FY 2008 occurred pursuant to the MBTA through the issuance of a depredation permit by the USFWS or under depredation orders.

Table 20 - WS' take of bird species in New Jersey during FY 2008 by method

SPECIES	METHOD				TOTAL
	Firearm	Traps	DRC-1339	Other[a]	
Black Vulture	1	0	0	0	**1**
Turkey Vulture	6	0	0	0	**6**
Mallard	11	0	0	0	**11**
Wild Turkey	1	0	0	0	**1**
Killdeer	18	0	0	0	**18**
Laughing Gull	198	0	0	0	**198**
Herring Gull	1	0	0	0	**1**
Mourning Dove	2	81	0	0	**83**
American Crow	2	0	0	0	**2**
European Starling	3	368	2,000	0	**2,371**
Red-winged Blackbird	4	1	0	0	**5**
House Sparrow	0	0	0	1	**1**
Feral Goose	0	28	0	9	**37**
Feral Duck	0	0	0	30	**30**

[a]Other methods could include non-chemical methods such as hand-capture, mist net, and/or cannon net. All methods employed were discussed in Appendix B of the EA.

As part of an integrated approach to resolving requests for assistance to manage damage caused by birds in the State, WS continued to apply non-lethal methods to resolve damage or threats. During direct operational assistance provided by WS at the request of a cooperator, WS dispersed 2,993 birds during FY 2008 to alleviate damage. WS dispersed 1,993 laughing gulls in FY 2008 to alleviate damage and reduce threats. Nearly 97% of the vultures addressed by WS in FY 2008 were non-lethally dispersed from areas where damage was occurring. Overall, nearly 52% of the birds addressed by WS in FY 2008 were dispersed to alleviate damage using non-lethal methods. If the lethal take of European starlings in FY 2008 is not considered, then over 88% of the birds addressed by WS were addressed using non-lethal methods as part of an integrated approach. Over 88% of the birds lethally taken by WS were bird species that are considered non-native in New Jersey.

Bird Population Impact Analysis from WS' activities in New Jersey from FY 2003 through FY 2008

A common concern when addressing damage associated with wildlife species are the effects on the populations of those species from methods used to manage damage. The integrated approach of managing damage associated with birds described in the EA under the proposed action alternative uses both non-lethal and lethal methods to resolve requests for assistance. Although non-lethal methods can disperse wildlife from areas where application occurs, wildlife are generally unharmed. Therefore, adverse affects are not often associated with the use of non-lethal methods. However, methods used to lethally take birds can result in local reductions in those species' populations in the area where damage or threats of damage were occurring.

The analysis for magnitude of impact on populations from the use of lethal methods generally follows the process described in WS' programmatic FEIS (USDA 1997). Magnitude is described in WS' programmatic FEIS as "*...a measure of the number of animals killed in relation to their abundance*."

Magnitude may be determined either quantitatively or qualitatively. Quantitative determinations are based on population estimates, allowable harvest levels, and actual harvest data. Qualitative determinations are based on population trends and harvest data when available. Generally, WS only conducts damage management on species whose population densities are high and usually only after they have caused damage. WS' take is monitored by comparing numbers of animals killed with overall populations or trends in populations to assure the magnitude of take is maintained below the level that would cause significant adverse impacts to the viability of native species populations (USDA 1997).

WS' cumulative take of birds by species from FY 2003 through FY 2008 is shown in Table 21. WS' total take for the six-year period has not exceeded 50 individuals of any bird species except for the take of mourning doves, laughing gulls, and European starlings. Excluding mourning doves, laughing gulls, and European starlings, the highest level of take over the six-year period was the take of 40 killdeer which is an average of seven killdeer taken by WS per year since FY 2003. The lethal take of up to 40 individuals of any bird species during the six-year period (an average take of up to seven individuals of each species by WS annually) has not adversely affected those species' populations in the State. Take of those species has been within the annual take evaluated in the EA. The permitting of the take by the USFWS pursuant to the MBTA ensures cumulative take by WS and other entities does not adversely affect populations and that cumulative take is considered as part of population management objectives established by the USFWS for those species, including population trend data and mortality factors. Nearly 77% of the birds lethally taken by WS in the State since FY 2003 were from species that are not native to New Jersey.

Take of birds can also occur when authorized by the USFWS through the issuance of depredation permits or through depredation orders by other entities besides WS. The cumulative take of mourning doves, laughing gulls, and European starlings by WS has exceeded 40 birds over the six-year reporting period. To ensure WS' take and take by other entities does not adversely affect those species' populations, further population impact analyses will occur for those species.

Table 21 – WS' Take of birds by species from FY 2003 through FY 2008

Species	Fiscal year						Total
	2003	2004	2005	2006	2007	2008	
Black Vulture	0	7	5	7	0	1	**20**
Turkey Vulture	0	0	4	11	0	6	**21**
Mallard	0	0	0	0	0	11	**11**
Wild Turkey	0	0	0	0	0	1	**1**
Killdeer	3	2	0	7	10	18	**40**
Laughing Gull	100	260	91	256	435	198	**1,340**
Ring-billed Gull	5	0	0	0	0	0	**5**
Herring Gull	1	0	0	1	1	1	**4**
Great Black-backed Gull	1	0	0	0	0	0	**1**
Rock Pigeon	29	1	0	0	0	0	**30**
Mourning Dove	5	0	0	0	8	83	**96**
American Crow	0	0	0	0	0	2	**2**
Tree Swallow	0	0	0	20	0	0	**20**
European Starling	708	431	105	554	978	2,371	**5,147**
Red-winged Blackbird	1	0	0	27	3	5	**36**
Common Grackle	0	0	0	0	1	0	**1**
Brown-headed Cowbird	0	0	5	0	0	0	**5**
House Sparrow	3	0	3	7	11	1	**25**
Feral Goose	0	0	0	0	0	37	**37**
Feral Duck	0	0	0	0	0	30	**30**

Mourning Dove Population Impact Analysis

Mourning doves are migratory birds with substantial populations throughout much of North America. Many states have regulated annual hunting seasons for doves with generous bag limits. However, New Jersey does not allow doves to be harvested in the State. Across the United States, the preliminary mourning dove harvest in 2008 was estimated at almost 17.4 million doves (Raftovich et al. 2009).

Mourning doves can be found year-round in New Jersey (Otis et al. 2008). According to Breeding Bird Survey (BBS) trend data provided by Sauer et al. (2008), mourning dove populations have increased at an annual rate of 0.2% in New Jersey since 1966. BBS routes across the region in the eastern United States are also showing a statistically significant annual increase estimated at 0.5% since 1966 (Sauer et al. 2008). The breeding mourning dove population in New Jersey has been estimated to be 270,000 doves (Rich et al. 2004). From 1999 through 2008, the number of mourning doves heard per route during mourning dove surveys in New Jersey has shown a declining trend in the State (Dolton et al. 2008). Christmas Bird Count (CBC) data indicates a general stable trend for doves observed wintering in the State (National Audubon Society 2002).

The EA evaluated an annual take of up to 50 mourning doves by WS in the State which was based on requests for assistance received prior to the development of the EA. WS' annual take of mourning doves did not exceed the value evaluated in the EA except for the take of doves by WS that occurred in FY 2008. Prior to FY 2008, a total of 11 mourning doves were lethally taken by WS with five taken in FY 2003 and eight taken in FY 2007. In FY 2008, a total of 83 mourning doves were lethally taken by WS to alleviate threats to aircraft which exceeded the level analyzed in the EA by 33 doves. Based on a dove population estimated at 270,000 doves in the State and the stable trend for mourning doves in the State observed during the BBS and the CBC, WS' total take of 83 doves in FY 2008 represents 0.03% of the estimated statewide population. WS' take of mourning doves in FY 2008 occurred within the permitted levels authorized by depredation permits issued by the USFWS.

Based on the limited take that occurred by WS when compared to the statewide breeding population and the authorizing of take by the USFWS pursuant to the MBTA, WS' take of morning doves to alleviate damage has not adversely affected dove populations in the State. Based on known sources of take, WS does not anticipate any adverse cumulative impacts from the proposed take to alleviate threats of aircraft strikes. The proposed increase in mourning dove take evaluated as part of the supplement to the EA will be evaluated further in following sections.

Laughing Gull Population Impact Analysis

Biological assessments for identifying the potential impact of harvest and/or removal programs on bird populations have a long history of application in the United States. Population modeling and extensive monitoring programs form the basis of an adaptive decision-making process used each year for setting migratory gamebird harvest regulations, while ensuring that levels of take are sustainable. Increasing human-wildlife conflicts caused by migratory bird species (both game and nongame), and their potential impacts on sensitive species and their habitats, has resulted in greater use of analytical tools to evaluate the effects of authorized take to achieve population objectives (Runge et al. 2009). One such tool is referred to as the Potential Biological Removal (PBR) model (Wade 1998, Runge et al. 2004). The USFWS recently completed PBR models for laughing gulls in Bird Conservation Region (BCR) 14 and BCR 30. The southern portion of New Jersey lies within BCR 30 with nesting colonies along the coastal areas of the State. Although only a portion of New Jersey lies within BCR 30, the gulls present in the State are those gulls likely to migrate from and have breeding colonies in BCR 14 and BCR 30. Since population estimates and trends for laughing gulls in the State are limited, the PBR models developed by

the USFWS for BCR 14 and BCR 30 will be used to analyze potential population impacts since the gulls present in the State are likely those gulls migrating from and nesting in BCR 14 and BCR 30.

To use the PBR method to determine levels of allowable take, or cumulative impacts over a large geographic area, the information required includes a minimum estimate of the population size using science-based monitoring programs (*e.g.*, BBS, CBC, coordinated colony surveys), and the intrinsic rate of population growth. The formula for PBR is:

$$\text{PBR} = ½\, R_{max} N_{min} F_R$$

where R_{max} is the maximum population growth rate at low densities, and in the absence of removal (Runge et al. 2004), N_{min} is the minimum population size, and F_R is a recovery factor ranging from 0.1 to 2.0. The recovery factor is a qualitative assessment that is typically set at low levels for endangered (F_R = 0.1) or threatened species (F_R = 0.5; Taylor et al. 2000), or if the status of the population is poorly known (Runge et al. 2004). However, using a recovery factor above 1.0 has been discussed for species in which the management objective is to hold the population at a smaller fraction of its carrying capacity (Runge et al. 2009).

To estimate R_{max} for laughing gulls, the Slade formula (Slade et al. 1998) was used:

$$1 = p\lambda^{-1} + 1_{\alpha}\, b\lambda^{-\alpha} - l_{\alpha} b p^{(\omega-\alpha+1)}\, \lambda^{-(\omega+1)}$$

where p is adult annual survival rate, $l\alpha$ is the survival rate from birth to age at first reproduction, b is the number of female offspring per female of reproductive age per year, α is the age at first reproduction, ω is the age at last reproduction, and λ is the intrinsic rate of population change. After solving the above equation for λ, R_{max} was estimated as $\ln(\lambda)$. Population parameter estimates were taken from the literature for laughing gulls (see Table 22), or in cases where estimates were not available, surrogate estimates from closely-related species were used (Seamans et al. 2007). Because there was uncertainty associated with demographic parameter estimates, allowable take levels were calculated using a simulation approach to estimate a range of R_{max} values with parameter estimates randomly drawn from normal distributions based on reported standard errors (see Table 22; Seamans et al. 2007).

Table 22 - Demographic parameter estimates (θ) used for estimating R_{max} and PBR of laughing gulls in BCR 14 and BCR 30 (Seamans et al. 2007)

		Laughing gull[1]	
Parameter	**Age class**	**(θ)**	**SE (θ)**
p	Adult	0.87	0.03
$l\alpha$	Adult	0.56	
	Hatch Year	0.729	0.035
	Second Year	0.886	0.024
b		0.752	0.022
α		3	
ω		19	
N_{min}		270,000	
R_{max}		0.113	0.036

[1]Dinsmore and Schreiber 1974, Burger 1996

Population estimates (N_{min}) for each species were based on the number of gulls at known breeding colonies in BCR 14 and BCR 30 during the mid-1990s (USFWS 2008), and adjusted using a conservative estimate of 0.75 non-breeding gulls per breeder to estimate the total population (Seamans et al. 2007).

Allowable take levels (± 95 CI) for laughing gulls under three recovery factors (0.5, 1.0, 1.5) in BCR 14 and BCR 30 are presented in Table 23.

Table 23 - PBR (± 95% CI) of laughing gulls in BCR 14 and BCR 30 under three recovery factors (Seamans et al. 2007)

Species	Recovery Factor		
	$F_R = 0.5$	$F_R = 1.0$	$F_R = 1.5$
Laughing Gull	7,685 (3,927 – 12,685)	15,274 (7,188 – 23,042)	26,044 (10,798 – 34,818)

Laughing gulls can be found nesting along the coastal areas of BCR 14 and BCR 30 with most breeding colonies occurring in BCR 14 (USFWS 2008). Over 200,000 laughing gulls nest along the coastal areas in BCR 30 and have been given a conservation rank of lowest concern (USFWS 2008). In BCR 14, nesting laughing gulls are estimated at 2,704 gulls and have been given a conservation rank of lowest concern (USFWS 2008). The breeding population of laughing gulls in the 1970s was estimated at 129,768 gulls in 63 colonies. In the 1990s, the breeding population had increased to 205,348 laughing gulls in 275 colonies which represented a 58% increase in regional abundance (USFWS 2008). BBS trend data for laughing gulls in the Eastern BBS Region shows a statistically significant increasing trend estimated at 3.4% annually since 1966 (Sauer et al. 2008). In the northeastern United States (USFWS Region 5)[7], BBS trend data shows an increasing trend estimated at 3.2% annually since 1966 (Sauer et al. 2008). BBS data in New Jersey shows a declining population trend estimated at -2.3% since 1966 (Sauer et al. 2008). CBC data for laughing gulls observed overwintering in the State have shown a cyclical but generally stable trend since 1966 (National Audubon Society 2002).

From 2003 through 2007, the lethal annual take of laughing gulls by all entities in the northeastern United States (USFWS Region 5) has ranged from 4,559 to 6,007 gulls with an average annual take of 5,341 laughing gulls (J. Dyer, USFWS pers. comm. 2009). The PBR model for laughing gulls in BCR 14 and BCR 30 estimates that nearly 15,000 laughing gulls can be taken annually with no adverse affect on the current population. Current take levels from all known entities in the breeding range of laughing gulls has not exceeded the level of annual take that would cause a decline in the breeding laughing gull population based on the PBR model. Based on the increasing populations observed from summer and winter surveys and the cumulative take of laughing gulls in the northeastern United States being below the level where a decline would occur in the population, WS' take of laughing gulls since FY 2003, with the oversight of cumulative take by the USFWS, has not adversely affect laughing gull populations.

European Starling Population Impact Analysis

Since FY 2003, WS has lethally taken 5,147 European starlings in the State to alleviate damage to agricultural resources, property, and to reduce threats to human safety. The highest level of take by WS occurred in FY 2008 when 2,371 starlings were taken. The breeding population of starlings in New Jersey has been estimated at 690,000 birds (Rich et al. 2004). The number of starlings observed in the State during the BBS has shown a statistically significant downward trend estimated at -1.9% since 1966 (Sauer et al. 2008). In the northeastern United States (USFWS Region 5), a similar trend has been observed for starlings estimated at -1.7% since 1966 (Sauer et al. 2008). The number of starlings observed overwintering in the State during the CBC has shown a general stable trend (National Audubon Society 2002).

[7]The USFWS is divided into nine regions in the United States. USFWS Region 5 includes Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, Virginia, and West Virginia.

Starlings are considered a non-native species in the State and are afforded no protection under the MTBA. Since starlings are afforded no protection under the MBTA, take data is not reported to the USFWS. Therefore, the take of starlings by other entities in New Jersey is unknown. Based on the current population estimate of 690,000 starlings in the State, WS' total take of 5,147 starlings since FY 2003 would represent 0.7% of the estimated population. WS' highest take of starlings occurred in FY 2008 when 2,371 starlings were lethally taken. WS' lethal take in FY 2008 would represent 0.3% of the estimated population. Based on the limited take occurring by WS when compared to the estimated statewide population, WS' take has not adversely affected starling populations in the State. Any take of starlings could be viewed as benefitting the natural environment in New Jersey since starlings often compete with native wildlife species for food and nesting resources.

Summary of Bird Impact Analyses

The EA concluded that the effects of WS' damage management activities in New Jersey would not adversely impact those populations of bird species addressed in the EA when damage management activities occurred within the scope analyzed. Analyses conducted during the annual monitoring of WS' activities in New Jersey for the management of bird damage determined that WS' lethal take of birds in the State was not adversely impacting populations based on the best available information on those species' populations. The permitting of those activities by the USFWS pursuant to the MBTA provides additional analyses and outside review that WS' activities since FY 2003 have not negatively impacted populations of those birds addressed in the EA.

WS' damage management activities were site specific, and although local populations of target wildlife species may have been reduced, there was no probable adverse impact on statewide, regional, or national populations of those species from WS' activities from FY 2003 through FY 2008. The potential impacts of program activities on wildlife species have not changed from those analyzed in the EA. All take by WS occurred pursuant to the MBTA. Therefore, based on the annual monitoring of WS' activities being within the scope analyzed in the EA except for the take of mourning doves in FY 2008, WS' activities have not had an adverse impact on target bird populations. Further analysis of WS' take of mourning doves in FY 2008 indicates the magnitude of WS' take of mourning doves has been low.

Population Impact Analysis of the Proposed Supplement to the EA

To further analyze WS' bird damage management activities in the State and to clearly communicate to the public the potential individual and cumulative impacts of those activities, WS has prepared this summary report and supplement to the EA. The supplement will further address WS' increased take of mallards, osprey, wild turkeys, killdeer, ring-billed gulls, herring gulls, great black-backed gulls, and mourning doves in the State to reduce damage and threats to human safety.

Mallard Population Impact Analysis

Mallards are one of the most abundant waterfowl species in North American being widely distributed across most of the continent (Drilling et al. 2002). In New Jersey, mallards can be found year around with densities dependant on open water during the winter months (Drilling et al. 2002). During breeding waterfowl surveys conducted along routes across the Atlantic Flyway (which includes New Jersey), the statewide population of mallards in New Jersey during the 2007 survey was estimated at over 52,000 mallards while the 2008 survey estimated the breeding population at 45,000 mallards (Padding and Klimstra 2008). The number of mallards observed in the State during the midwinter waterfowl survey was estimated at 35,725 mallards in 2008 compared to 23,155 mallards observed in the State during the 2007 survey (Padding and Klimstra 2008). The number of mallards observed during the BBS in the State has shown a declining trend estimated at -0.1% since 1966 (Sauer et al. 2008). In the northeastern United

States (USFWS Region 5), the number of mallards observed during the BBS has shown a statistically significant increase estimated at 3.8% since 1966 with a 2.0% increase across all BBS routes in the United States since 1966 which is also statistically significant (Sauer et al. 2008). The number of mallards observed overwintering in the State has shown a general increasing trend since 1966 (National Audubon Society 2002).

As with many other waterfowl species, mallards can be harvested annually during regulated seasons which are implemented by the NJDFW under frameworks established by the USFWS pursuant to the MBTA. During the 2007 hunting season in the State, an estimated 20,301 mallards were harvest with an estimated 14,427 mallards harvested during the 2008 season (Raftovich et al. 2009). In the Atlantic Flyway, which includes New Jersey, an estimated 429,917 mallards were harvested during the 2007 season with 503,480 mallards harvested during the 2008 season (Raftovich et al. 2009).

Mallards can also be taken in the State to alleviate damage and threats through the issuance of depredation permits by the USFWS. Table 24 shows the number of permits issued to alleviate damage and threats in the State along with the reported taken and the number of nests destroyed. Since 2003, the only take of mallards in the State which was authorized by depredation permits occurred in 2008 when eleven mallards were taken by WS to alleviate damage and threats (see Table 25). Mallard nests were also authorized to be taken through the issuance of depredation permits. A total of six mallards nests have been destroyed since 2003 as authorized by the USFWS. No take of mallard nests has occurred by WS between FY 2003 and FY 2008. As part of an integrated approach to managing damage and threats, WS has employed primarily non-lethal methods to alleviate damage and threats associated with mallards in the State. Since FY 2003, WS has dispersed 84 mallards using non-lethal harassment methods, primarily to reduce threats associated with aircraft striking mallards at or near airports.

To address damage and threats associated with mallards in the State, the EA evaluated a lethal take of up to 50 mallards annually and up to 20 mallard nests as part of an integrated approach to addressing requests for assistance. Based on the number of requests for assistance and the number of inquiries received by WS regarding reducing threats associated with wildlife at airports, WS anticipates the number of mallards that will be addressed to alleviate damage and threats in the State will also increase. If the number of mallards addressed annually increases due to an increased number of requests for assistance, the number of mallards addressed using lethal and non-lethal methods will also increase.

Table 24 – All mallard take in New Jersey authorized by the USFWS through depredation permits

Year[1]	No. of Permits	Authorized Take	Reported Take	Authorized Nests	Nests Destroyed
2003	4	0	0	95	5
2004	5	20	0	170	1
2005	4	20	0	70	0
2006	5	32	0	60	0
2007	4	30	0	60	0
2008	3	30	11	20	0

[1]Reported by calendar year

To address an increasing number of requests for assistance, the lethal take of mallards annually by WS could increase up to 150 mallards and the number of nests destroyed annually by WS could increase to 50 nests. WS will continue to employ an integrated approach to managing damage using lethal and non-lethal methods. Non-lethal methods are generally regarded as having no adverse affect on wildlife populations since target species are only dispersed from an area. Therefore, an increase in the number of mallards dispersed annually will not adversely affect populations in the State.

Table 25 – Mallard take by WS in New Jersey authorized from FY 2003 through FY 2008

FY	Dispersed	Take	Nests Destroyed
2003	12	0	0
2004	7	0	0
2005	35	0	0
2006	0	0	0
2007	0	0	0
2008	30	11	0

Under the proposed supplement to the EA, WS will continue to address damage by targeting only those mallards identified as causing damage or posing a threat. As discussed previously, mallards can be found within the State throughout the year with the population of mallards fluctuating depending on the time of year. The breeding population of mallards in the State in 2008 was estimated at 43,000 mallards while the winter population in the State was estimated at 35,725 (Padding and Klimstra 2008). If take by WS in FY 2008 had totaled 150 mallards, WS' take would have represented 0.3% of the estimated breeding population of mallards in the State. Similarly, if WS' take had totaled 150 mallards in FY 2008, WS' take would represent 0.4% of the estimated winter population of mallards in the State.

An estimated 14,427 mallards were harvested in the State in 2008 during the regulated hunting season (Raftovich et al. 2009). If WS' take in FY 2008 had totaled 150 mallards, WS' take would represent 1.0% of the mallards harvested in the State. Since 2003, the USFWS has issued an average of four depredation permits to take mallards in the State to alleviate damage and threats, including the annual depredation permit issued to WS. The highest level of permitted take of mallards occurred in 2006 when 32 mallards were authorized to be taken by the USFWS. However, mallards were only taken in the State during FY 2008 by WS to reduce threats of aircraft strikes. For comparison, the number of mallards harvested in the State during the regulated hunting season in 2008 would represent 33.6% of the estimated breeding mallard population in the State during 2008 and 40.4% of the estimated winter population in the State.

Based on current information, WS' take of up to 150 mallards annually could be considered of low magnitude when compared to the annual harvest level of mallards during the regulated season. Take of mallards can only occur by WS when authorized by the USFWS through the issuance of depredation permits. The allowed take of mallards by all entities through the issuance of depredation permits is determined and regulated by the USFWS. The harvest of mallards in the State during the annual hunting season also occurs under frameworks established by the USFWS and implemented by the NJDFW.

In addition to lethal take, the USFWS has authorized the destruction of mallard nests and eggs to discourage mallards from nesting in areas where they may cause damage or pose a threat. Nest and egg destruction methods are considered non-lethal when conducted before the development of an embryo. Although there may be reduced fecundity for the individual mallards affected, this activity has no long term effect on breeding population when limited destruction of nests and/or eggs occurs. Nest and egg removal is not used by WS as a population management method. This method is used by WS and authorized by the USFWS to inhibit nesting in an area where damage or threats could occur and is intended to disperse nesting mallards to areas where there are no conflicts. Repeated nest failures induced by WS is often enough to discourage a pair of mallards to disperse to other areas where nesting can occur.

Since all take of mallards in the State occurs under authorities of the USFWS and take of mallards is monitored by the USFWS, all sources of take are considered by the USFWS when establishing population objectives for mallards. Take by WS can only occur through the issuance of depredation permits issued by the USFWS. Therefore, the take of up to 150 mallards by WS and up to 50 mallard nests must be

authorized and permitted by the USWFS annually. Based on current information, WS' proposed take could be considered to be of a low magnitude when compared to the estimated statewide population of mallards and when compared to the annual harvest of mallards in the State.

Osprey Population Impact Analysis

Damages and threats associated with osprey in New Jersey occur primarily from osprey nests. WS has previously addressed requests for assistance with managing damage and threats associated with osprey through technical assistance. Technical assistance provides information on damage management activities to those persons experiencing damage. WS may be requested to conducted direct operational assistance in which WS is directly involved with applying methods and techniques to resolve damage or threats associated with osprey. Ospreys were not directly addressed in the EA because WS had not received requests for assistance with osprey prior to the development of the EA. No technical assistance projects or direct operational assistance was provided by WS prior to FY 2007. WS conducted one technical assistance project in FY 2007 and one technical assistance project in FY 2008 involving osprey damage and threats to utility poles. As discussed previously, if requested, WS could provide direct operational assistance to alleviate threats and damages which is being analyzed as part of the supplement to the EA.

WS' involvement with direct operational assistance with alleviating damage or reducing threats would be limited to nest removal activities when nests cause damage or when nests are deemed an imminent threat of damage. The removal of nests must be approved by the USFWS through the issuance of depredation permits. In addition, the NJDFW currently lists the breeding population of osprey in the State as threatened. Therefore, any activities involving osprey or the nests of osprey require a permit and authorization from the NJDFW. Any activities conducted by WS involving osprey would occur only if those activities are approved by the NJDFW and the USFWS through the issuance of depredation permits or other appropriate authorizations.

To alleviate damage and threats associated with osprey nests, WS anticipates up to five osprey nests could be removed based on previous requests for technical assistance. Any eggs located in nests to be removed would be transported to a State-approved wildlife rehabilitator to be reared until they can be released into the wild or would be relocated to other osprey nests. Nestlings in osprey nests to be removed would be captured and provided to State-approved wildlife rehabilitators for rearing to be released back into the wild. The clutch size for osprey ranges from one to four eggs (Poole et al. 2002). Therefore, up to 20 eggs and/or nestlings could be removed from nests and released to wildlife rehabilitators for rearing. If an appropriate rehabilitator can not be located, eggs could be destroyed through addling or shaking. Nestlings located in a nest to be removed would only be removed from the nest if a rehabilitator has agreed to rear the nestlings for release. If nestlings are present and a rehabilitator can not be located to rear the nestlings, the nest would not be removed until the nestlings have fledged and are no longer present in the nest.

Osprey survey data gathered during the breeding season in New Jersey from 1966 through 2007 shows an increasing population trend estimated at 18.1% annually (Sauer et al. 2008). Regionally, the number of osprey observed during the breeding season has shown a statistically significant increasing trend estimated at 7.6% annually since 1966 (Sauer et al. 2008). The number of osprey observed breeding in the United States is also showing a statistically significant increasing trend estimated at 5.7% annually since 1966 (Sauer et al. 2008). A statewide breeding population of osprey in New Jersey has been estimated at 1,500 individuals (Rich et al. 2004). Surveys conducted in 2009 revealed 485 pairs of osprey nesting in the State which is an increase of 21% compared to the number of pairs observed during the previous survey conducted in 2006 (Clark and Wurst 2009). A total of 56 new osprey nests were identified in 2009 during the survey with productivity across all nests in the State averaging 1.59 young

per active nest which is double the minimum production of 0.80 young per active nest needed to sustain the population of osprey in New Jersey (Clark and Wurst 2009).

Osprey nests will only be removed when damage has occurred or when the presence of the nest or osprey tending the nest is deemed an imminent threat of damage. Based on previous requests for assistance, up to five nests could be removed annually by WS. If each nest to be removed contained four eggs, up to 20 eggs could be relocated to other osprey nests, could be released to wildlife rehabilitators for rearing, and/or could be destroyed when other osprey nests or a State-approved rehabilitator can not be located. The relocation of up to 20 eggs or the release of up to 20 eggs to wildlife rehabilitators will not adversely affect populations of osprey in the State since those eggs are likely to be reared and released into the wild. The destruction of bird eggs as part of bird damage management activities is generally considered a non-lethal method that does not adversely affect populations when the number of eggs destroyed is limited. If 20 osprey eggs were destroyed, the take would represent 1.3% of the current estimated statewide population of osprey. However, take of up to 20 eggs annually is unlikely given the average number of eggs per osprey nest ranges from one to four. The take of 20 eggs was analyzed to present a worse case scenario to determine the potential for population impacts. Since nests containing nestlings will only be removed if the nestlings can be provided to approved wildlife rehabilitators, no adverse affect on osprey populations is expected since those osprey will be reared and released into the wild.

Wild Turkey Population Impact Analysis

The need for reducing threats associated with wild turkeys was addressed previously in this report and supplement. Wild turkeys were not specifically addressed in the EA and were not identified as posing a threat of damage or a threat to human safety during the development of the EA based on prior requests for assistance. The number of requests for assistance received by WS involving wild turkeys identified as posing a threat of damage, primarily at airports, has increased since the completion of the EA in FY 2003.

Impacts of take on wild turkey populations were not directly analyzed in the EA since turkeys were not identified as causing damage or posing a threat to human safety during the scoping and development of the EA in FY 2003 based on prior activities. Since the completion of the EA, the number of wild turkeys identified as posing a threat of damage and a threat to human safety has increased and has been deemed a consistent and significant threat to aircraft when found on airport property or surrounding areas where strikes could occur. WS has also received requests for assistance regarding turkeys that act aggressively toward people and pets during the nesting season as well as cause damage to property from attacking their reflection in picture windows.

The number of wild turkeys addressed by WS that have been identified as causing damage and posing a threat has increased since FY 2003 and will likely continue to increase. From FY 2003 through FY 2005, WS conducted a total of three technical assistance projects with one technical assistance project involving wild turkeys being conducted each year. From FY 2006 through FY 2008, WS conducted 14 technical assistance projects. In FY 2006, WS received requests for direct operational assistance to address damage and threats. WS employed non-lethal methods to disperse 11 turkeys posing threats to aircraft in New Jersey during FY 2006. In FY 2007, WS dispersed seven turkeys to reduce threats associated with turkeys being struck by aircraft. During FY 2008, four turkeys were dispersed and one turkey was lethally taken by WS to alleviate threats at airports. Based on the increase in the number of wild turkeys addressed at airports recently and the potential for requests for assistance to manage damage and threats to other resources associated with turkeys, WS anticipates the take of wild turkeys to increase to no more than 30 turkeys annually.

Wild turkeys can be found throughout the State wherever suitable habitat exists and are considered abundant (NJDFW 2009a). Turkeys were extirpated from the State by the mid-1800s from habitat loss

and over exploitation (NJDFW 2009a). Restoration efforts by the NJDFW and other organizations began in 1977 with the release of 22 turkeys. By 1981, the population had increased sufficiently to allow for a spring hunting season (NJDFW 2009a). Wild turkeys are considered a harvestable species by the NJDFW in the State with a regulated hunting season in which take of turkeys can occur. The take of turkeys by WS would only occur after a depredation permit has been issued by the NJDFW authorizing the take.

According to trend data available from the BBS, wild turkeys are showing an increasing trend in New Jersey estimated at 16.9% annually since the BBS was initiated in 1966 (Sauer et al. 2008). Wild turkeys observed on BBS routes in the eastern United States, have also shown a statistically significant increase since 1966, estimated at 13.9% annually, with a statistically significant increasing trend across BBS routes in the United States estimated at 12.6% annually since 1966 (Sauer et al. 2008). Trend data available from the CBC also indicates an increasing trend in the number of turkeys observed during the winter in New Jersey (National Audubon Society 2002). The NJDFW currently estimates the statewide turkey population to be over 22,000 birds (NJDFW 2009b).

Wild turkeys can be harvested during a regulated hunting season in New Jersey. During the 2008 spring hunting season, 3,442 wild turkeys were harvested in the State which was an increase of 12.4% compared to the 2007 harvest in the State (NJDFW 2009a). An additional 163 turkeys were harvested during a fall season in the State (NJDFW 2009a). WS' take of up to 30 wild turkeys in the State would represent 0.1% of the estimated turkey population in the State and 0.9% of the number of turkeys harvested in the State during the 2008 hunting season for turkeys. All take of turkeys by WS in New Jersey would occur under a permit issued for those activities by the NJDFW. Therefore, WS' take would be considered as part of population management objectives established for wild turkeys in the State and would not limit the ability of persons to harvest turkeys during the regulated hunting seasons in the State.

WS will continue to assist airport personnel in identifying habitat, food sources, and structures that can act as attractants to wild turkeys on airport property. WS will also continue to address threats associated with wild turkeys using non-lethal harassment methods. However, wild turkeys may be lethally removed when deemed an imminent threat or continual threat to resources. Since FY 2003, all turkeys addressed as threats were dispersed or harassed using non-lethal methods except for the take of one turkey in FY 2008 that was determined to be a continual threat to aircraft. The permitting of the take by the NJDFW ensures those activities will not adversely impact wild turkey populations.

Killdeer Population Impact Analysis

Under the proposed action alternative, the EA evaluated the lethal take of up to 50 killdeer annually by WS in the State as part of an integrated approach using both lethal and non-lethal methods to resolve damage and threats. As stated previously, airports often provide habitat preferred by killdeer with nesting, foraging, and loafing occurring adjacent to or on airport runways and taxiways. As additional airports request WS' assistance with managing damage associated with wildlife in the State, the number of killdeer addressed by WS annually is also likely to increase. As part of an integrated approach described under the proposed action in the EA, WS could employ lethal methods when deemed appropriate by the WS Decision Model[8]. The increased use of non-lethal methods to disperse killdeer from airports will not adversely affect killdeer populations in the State. Non-lethal methods are generally regarded as having no impact on a species' population since birds are only dispersed from the area where damage is occurring.

[8]For a full description of the WS Decision Model and the application of model see Section 3.2.3 in the EA. Further discussion of the model also occurs in WS' programmatic FEIS (USDA 1997).

As the number of airports requesting assistance from WS to manage damage and threats associated with killdeer increases, the number of killdeer lethally taken annually is also likely to increase when lethal methods are deemed appropriate for use to resolve damage and threats. To address an increasing number of requests for assistance, up to 75 killdeer could be lethally taken by WS annually under the proposed supplement to the EA which is an increase of 25 killdeer over the level of take analyzed in the EA.

From FY 2003 through FY 2008, WS has lethally taken a total of 40 killdeer in the State at airports to reduce damages and threats associated with aircraft striking killdeer. The highest level of killdeer take by WS occurred in FY 2008 when 18 killdeer were lethally taken (see Table 26). WS destroyed three nests and 10 killdeer eggs in FY 2006. WS also destroyed six killdeer eggs in FY 2007. In addition, WS has employed non-lethal methods to harass 101 killdeer at airports in the State from FY 2003 through FY 2008. Nearly 72% of the killdeer addressed by WS have been harassed using non-lethal methods since FY 2003.

Table 26 – Killdeer take by WS in New Jersey from FY 2003 through FY 2008

FY	Dispersed	Take	Nests Destroyed	Eggs Destroyed
2003	26	3	0	0
2004	45	2	0	0
2005	6	0	0	0
2006	12	7	3	10
2007	2	10	0	6
2008	10	18	0	0

Since 1966, the number of killdeer observed during the breeding season in the State has shown a decreasing trend estimated at -2.3% annually (Sauer et al. 2008). Killdeer observed on BBS routes in the eastern United States are showing a slightly increasing trend estimated at 0.1% annually since 1966 and a stable trend across the United States (Sauer et al. 2008). No current population estimates are available for the number of killdeer residing in the State. With a relative abundance estimated at 1.83 killdeer per route in New Jersey (Sauer et al. 2008), the killdeer population could be estimated at approximately 1,600 birds. Using a killdeer population estimated at 1,600 birds in New Jersey, WS' lethal removal of 75 killdeer would constitute 4.7% of the estimated population in the State. WS' impacts are likely much lower given the number of killdeer in New Jersey is likely more than 1,600 birds as a result of the bias associated with BBS data for certain species that are described in the EA. Survey data from the CBC indicates the number of killdeer overwintering in the State has been cyclical since 1966 (National Audubon Society 2002). Current data shows an increasing wintering trend after a period of lower killdeer counts.

The take of killdeer by entities other than WS has also been authorized by the USFWS to alleviate damage and to reduce threats to human safety. Table 27 lists the number of killdeer that have been authorized to be taken in the State annually from 2003 through 2008. The number of killdeer authorized to be taken annually by the USFWS by all entities has ranged from a low of 30 killdeer in 2004 to a high of 65 killdeer in 2008. The highest level of killdeer take occurred in 2008 when 18 killdeer were lethally taken in the State pursuant to depredation permits issued by the USFWS. The number of nests authorized to be destroyed by the USFWS since 2003 has ranged from zero to 40 nests. However, only ten nests have been reported to the USFWS as destroyed since 2003. The take of killdeer in the State has occurred primarily by WS which were lethally taken to reduce threats of aircraft strikes. From 2003 through 2008, the USFWS has authorized the take of 305 killdeer in the State which is an average of nearly 51 killdeer annually. The take of killdeer by WS would only occur at the level authorized by the USFWS through the issuance of a depredation permit.

Table 27 – Killdeer take by all entities in New Jersey authorized by the USFWS

Year[1]	Authorized Take	Reported Take	Authorized Nests	Nests Destroyed
2003	35	3	0	0
2004	30	2	20	2
2005	55	0	20	0
2006	60	12	25	3
2007	60	10	30	5
2008	65	18	40	0

[1]Reported by calendar year

WS' will continue to assist airport personnel in identifying habitat and other attractants to killdeer on airport property. Killdeer will continue to be addressed using primarily non-lethal harassment and dispersal methods. All take of killdeer occurred within the levels permitted by the USFWS pursuant to the MBTA. WS' limited take of killdeer at airports and the permitting of those take levels by the USFWS pursuant to the MBTA ensures those activities will not adversely impact killdeer populations.

Ring-billed Gull Population Impact Analysis

Ring-billed gulls breed from the southern James Bay in Canada to the Great Lakes, northeast along the St. Lawrence Valley to Newfoundland, and south to central New York (Levine 1998). Nesting colonies can be located on islands, parklands, slag yards, rooftops, breakwalls, and landfills. Large gravel rooftops are becoming ideal nesting habitats for ring-billed gulls due to the lack of predators (Belant 1993).

In 1984, the population of ring-billed gulls in the Great Lakes region was estimated at approximately 648,000 pairs (Blokpoel and Tessier 1986). Blokpoel and Tessier (1992) found that the nesting population of ring-billed gulls in the Canadian portion of the lower Great Lakes system increased from 56,000 pairs to 283,000 pairs from 1976-1990. In New Jersey, BBS data indicates an increasing trend in breeding populations of ring-billed gulls estimated at 10.4% annually since 1966 (Sauer et al. 2008). According to Sauer et al. (2008), the population of ring-billed gulls has increased throughout the United States, the northeastern United States, and across all routes in the eastern BBS region, at an annual rate of 2.6%, 4.4%, and 1.8%, respectively, from 1966-2007. Ring-billed gulls wintering in New Jersey are also showing a general increasing trend since 1966 (National Audubon Society 2002).

According to survey data and trends, ring-billed gulls are considered a species of least concern (USFWS 2008). As described previously, a PBR model has been developed to determine allowable harvest levels of gulls in BCR 14 and BCR 30. Almost 41,000 ring-billed gulls are believed to breed in BCR 14. There are no known breeding ring-billed gull colonies in BCR 30 (USFWS 2008). The USFWS authorized take of ring-billed gulls by all entities in New Jersey since 2003 is listed in Table 28. The highest level of reported take occurred in 2004 when 26 ring-billed gulls were taken by all entities in New Jersey though it only represented 11% of the authorized take of ring-billed gulls. In 2008, the USFWS authorized the take of up to 260 ring-billed gulls in New Jersey by all entities with a reported take of four ring-billed gulls. From 2003 through 2008, the USFWS has authorized the lethal take of 1,540 ring-billed gulls in the State to alleviate damage which is an average of nearly 257 gulls annually. The total reported take of ring-billed gulls in the State from 2003 through 2008 has been 52 gulls which is an average of nearly 9 gulls taken annually.

The USFWS also authorized ring-billed gull nests to be destroyed as part of depredation permits to prevent and alleviate damage. The number of nests reported as being destroyed is also shown in Table 28. The USFWS has authorized the annual take of up to 500 ring-billed gull nests since 2003. However, no take of ring-billed gull nests has occurred by any entity between 2003 and 2008.

Table 28 – Ring-billed gull take in New Jersey authorized by the USFWS by all entities

Year[1]	No. of Permits	Authorized Take	Reported Take	Authorized Nests	Nests Destroyed
2003	5	220	15	500	0
2004	5	230	26	500	0
2005	5	250	0	500	0
2006	7	290	7	500	0
2007	5	290	0	500	0
2008	4	260	4	500	0

[1]Reported by calendar year

As discussed in the EA, WS has addressed damage and threats associated with ring-billed gulls in New Jersey using methods in an integrated approach. WS employed lethal and non-lethal methods in an integrated approach to resolve damage and threats associated with gulls in New Jersey from FY 2003 through FY 2008, primarily from threats associated with aircraft striking gulls at airports. Although lethal methods were used by WS to take ring-billed gulls, over 99% of the gulls addressed in New Jersey by WS were dispersed using non-lethal harassment methods, such as pyrotechnics and other noise producing methods. WS addressed 404 ring-billed gulls using non-lethally methods in FY 2003 which was the highest number of ring-billed gulls addressed in any year from FY 2003 through FY 2008. Take of ring-billed gulls using lethal methods only occurred in FY 2003 when five gulls were taken with a firearm. Of those ring-billed gulls addressed in FY 2003, nearly 99% were dispersed using non-lethal methods.

WS employs nest and egg removal as a method to address damage caused by gulls. Nest and egg removal is not used by WS as a population control method. This method is used by WS to inhibit nesting in an area where damage or threats are occurring due to nesting activity and is intended to relocate a nesting pair or colony of ring-billed gulls to an area where there are no conflicts. No ring-billed gull nests have been destroyed by WS from FY 2003 through FY 2008 (see Table 29).

Table 29 – Ring-billed gull take by WS in New Jersey authorized from FY 2003 through FY 2008

Fiscal Year	Dispersed	Take	Nests Destroyed
2003	404	5	0
2004	121	0	0
2005	84	0	0
2006	21	0	0
2007	235	0	0
2008	131	0	0

From 2003 through 2007, the number of ring-billed gulls taken annually in the northeastern United States (USFWS Region 5) has ranged from 678 to 1,289 ring-billed gulls with an average annual take of 980 ring-billed gulls. The PBR model developed by the USFWS using those parameters in Table 30 currently predicts that 3,065 ring-billed gulls could be taken annually to maintain the current breeding population levels in BCR 14 and BCR 30 (see Table 31). Non-breeding ring-billed gulls are known to occur throughout BCR 14 and BCR 30 during the breeding season. Based on the known take of ring-billed gulls occurring annually in BCR 14 and BCR 30, the average annual take level of ring-billed gulls from all known sources is below the estimated level that would result in a breeding population decline.

The EA evaluated an annual take of up to 250 ring-billed gulls annually by WS in the State (USDA 2003). Under the proposed supplement to the EA, the take of ring-billed gulls by WS in the State could increase to 400 ring-billed gulls taken annually. The take of up to 100 ring-billed gull nests and/or eggs will remain as addressed in the EA (USDA 2003). Take would only occur at those levels specified in a

depredation permit issued by the USFWS but would not exceed 400 gulls annually under the proposed supplement.

Table 30 - Demographic parameter estimates (θ) used for estimating R_{max} and PBR of ring-billed gulls in BCR 14 and BCR 30 (Seamans et al. 2007)

		Ring-billed Gulls[1]	
Parameter	**Age class**	**(θ)**	**SE (θ)**
p	Adult	0.87	0.03
*l*α	Adult	0.56	
	Hatch Year	0.729	0.035
	Second Year	0.886	0.024
b		0.752	0.022
α		3	
ω		19	
N_{min}		54,000	
R_{max}		0.113	0.036

[1] Ryder 1993, Seamans et al. 2007

Table 31 lists the allowable take of ring-billed gulls in BCR 14 and BCR 30 under three recovery factors using the PBR model. To maintain current population levels (F_R = 1.0**)** of ring-billed gulls in BCR 14 and BCR 30, the model predicts that 3,065 ring-billed gulls can be harvested annually in BCR 14 and BCR 30 using those parameters in Table 30. The model predicts that an annually take of 4,588 ring-billed gulls would have to be harvested annually to cause a decline in the estimated ring-billed gull populations in the BCR 14 and BCR 30 while the lethal take of up to 1,532 gulls annually would likely result in a population increase.

Table 31 - PBR (± 95% CI) of ring-billed gulls in BCR 14 and BCR 30 under three recovery factors (Seamans et al. 2007)

Species	**Recovery Factor**		
	F_R = 0.5	**F_R = 1.0**	**F_R = 1.5**
Ring-billed Gull	1,532 (713 – 2,318)	3,065 (1,455 – 4,634)	4,588 (2,161 – 6,951)

As was mentioned previously, the average annual take of ring-billed gulls by all entities in BCR 14 and BCR 30 from 2003 through 2007 has been 980 gulls with a range of 678 to 1,289 gulls taken. If the take of ring-billed gulls is similar to take from 2003 through 2007 and if 400 ring-billed gulls were lethally taken by WS in New Jersey, the average annual take of ring-billed gulls by all entities would increase to 1,380 gulls taken annually. An average annual take of 1,380 would be nearly 55% below the level predicted by the PBR model that would cause a decline in the population. The average annual take would also be below the allowable take level predicted that would allow for an increasing population.

Based on the best available information described above, WS' potential impacts on populations of ring-billed gulls has been and is expected to continue to be insignificant to the overall viability and reproductive success of ring-billed gull populations on a local, regional, and nationwide scale. This determination is based on the increasing regional trends of ring-billed gull populations as derived from BBS data and PBR data for BCR 14 and BCR 30. The PBR model predicts ring-billed gulls in BCR 14 and BCR 30 could sustain a harvest of 3,065 individuals and maintain current population levels. WS' take and all known take in the northeastern United States since 2003 has not reached a level that indicates an adverse impact to ring-billed gull populations is occurring. The lethal take of up to 400 ring-billed gulls under the proposed supplement to the EA would not reach a magnitude that would cause the ring-

billed gull population to decline. With management authority over migratory birds, the USFWS could impose stricter take limits if warranted based on population data. The USFWS, as the agency with migratory bird management responsibility, could impose restrictions on depredation harvest as needed to assure cumulative take does not adversely affect the continued viability of populations. This ensures that cumulative impacts on ring-billed gull populations would have no significant adverse impact on the quality of the human environment.

Herring Gull Population Impact Analysis

Herring gulls are the most widely distributed gull species in the Northern Hemisphere. Herring gulls breed in colonies near oceans, lakes, or rivers (Bent 1921). In the northeastern United States, herring gulls nest along the Great Lakes and along the Atlantic Coast from Maine to northern South Carolina. Herring gulls will nest on natural or man-made sites, such as rooftops and breakwalls (Blokpoel and Scharf 1991).

According to trend data available from the BBS, the number of herring gulls observed during the breeding season is showing an increasing trend in New Jersey estimated at 3.0% annually since the BBS was initiated in 1966 (Sauer et al. 2008). Herring gulls observed on BBS routes in the eastern United States are showing a statistically significant decline estimated at -5.6% with a smaller decline occurring since 1980 estimated at -3.3% annually (Sauer et al. 2008). The number of herring gulls observed along routes surveyed during the BBS in the northeastern United States are also showing a declining trend estimated at -0.5% annually since 1966 (Sauer et al. 2008).

Trend data available from the CBC indicates a general stable trend in the number of herring gulls observed wintering in New Jersey since 1966 (National Audubon Society 2002). According to the Mid-Atlantic/New England/Maritimes Waterbird Conservation Plan, herring gulls are considered a species of low concern in North America and of moderate concern in BCR 14 (USFWS 2008). In BCR 30, which includes New Jersey, the herring gull is considered a species of low concern (USFWS 2008). Over 196,000 herring gulls are believed to breed in BCR 14. In addition, over 90,000 herring gulls are believed to breed in the neighboring BCR 30. Of those, over 75,000 herring gulls occur in the Gulf of Maine, which includes breeding populations along the coast of New Jersey (USFWS 2008).

From FY 2003 through FY 2008, a total of four herring gulls have been lethally taken by WS in New Jersey (see Table 32). Take occurs primarily to reduce threats of aircraft striking gulls at airports and to reduce damages at landfills in New Jersey. As part of an integrated approach to reducing damage and threats associated with herring gulls, WS continues to use non-lethal harassment methods to disperse gulls. Since FY 2003, WS has addressed 2,011 herring gulls using non-lethal methods. The take of herring gulls also occurs by other entities (*e.g.*, airports, landfills) through depredation permits issued by the USFWS.

Table 32 – Herring gull take by WS in New Jersey from FY 2003 through FY 2008

FY	Dispersed	Take	Nests Destroyed
2003	409	1	0
2004	420	0	0
2005	5	0	0
2006	777	1	0
2007	298	1	0
2008	102	1	0

Table 35 lists the number of depredation permits issued by the USFWS since 2003 for the take of herring

gulls and the reported take of herring gulls in New Jersey authorized by a permit by all entities. The number of depredation permits issued by the USFWS has ranged from five to nine permits annually with an authorized annual take ranging from 220 gulls to 410 gulls annually. The highest level of herring gull take occurred in 2007 when 75 gulls were taken in New Jersey. Herring gull nests were also authorized to be destroyed by the USFWS through the issuance of depredation permits. However, no take of herring gull nests occurred in New Jersey from 2003 through 2008.

As previously discussed, the USFWS has developed a PBR model to estimate the allowable take of herring gulls in BCR 14 and BCR 30 which includes New Jersey. Based on the model using those parameters in Table 33 for herring gulls, an allowable harvest of up to 16,725 herring gulls in BCR 14 and BCR 30 would maintain current population levels (see Table 34).

Table 33 - Demographic parameter estimates (θ) used for estimating R_{max} and PBR of herring gulls in BCR 14 and BCR 30 (Seamans et al. 2007)

		Herring Gulls[1]	
Parameter	**Age class**	**(θ)**	**SE (θ)**
p	Adult	0.87	0.03
$l\alpha$	Adult	0.42	
	Hatch Year	0.729	0.035
	Second Year	0.886	0.024
b		0.752	0.022
α		5	
ω		20	
N_{min}		390,000	
R_{max}		0.086	0.027

[1]Pierotti and Good 1994

Impacts due to nest and egg removal and destruction should have little adverse impact on the herring gull populations regionally and in New Jersey. Nest and egg destruction methods are considered non-lethal when conducted before the development of an embryo. Additionally, herring gulls are a long lived species and have the ability to identify areas with regular human disturbance and low reproductive success which causes them to relocate and nest elsewhere when confronted with repeated nest failure. Although there may be reduced fecundity for the individuals affected, this activity has no long term effect on breeding adult herring gulls. Nest and egg removal is not used by WS as a population management method. This method is used by WS to inhibit nesting in an area experiencing damage due to nesting activity and is intended to relocate a nesting pair or colony of herring gulls to an area where there are no conflicts. From FY 2003 to FY 2008, no herring gull nests or eggs were destroyed by WS.

Table 34 - PBR (± 95% CI) of herring gulls in BCR 14 and BCR 30 under three recovery factors (Seamans et al. 2007)

Species	**Recovery Factor**		
	F_R = 0.5	**F_R = 1.0**	**F_R = 1.5**
Herring Gull	8,360 (3,892 – 12,656)	16,725 (7,788 – 25,397)	25,048 (11,716 – 37,875)

To maintain current population levels, the PBR model developed by the USFWS predicts that 16,725 herring gulls can be taken in BCR 14 and BCR 30 annually based on F_R = 1.0 (see Table 34). In the northeastern United States (USFWS Region 5), the average annual reported take of herring gulls from 2003 through 2007 has been 3,171 herring gulls by all entities issued depredation permits by the USFWS. Herring gull take by all entities in the northeastern United States has ranged from 2,117 gulls to a high of

3,911 gulls taken under depredation permits issued by the USFWS between 2003 and 2007. Based upon the PBR model, the average annual take of herring gulls in USFWS Region 5 has been below the level of take that would lead to a population decline. To maintain current herring gull populations, the PBR model estimated the allowable harvest of herring gulls in BCR 14 and BCR 30 was over 16,000 gulls annually. With $F_R = 0.5$ (recovery factor), the PBR predicted 8,360 herring gulls could be harvested annually in BCR 14 and BCR 30 which would likely lead to a population increase. The average annual take of herring gulls in the northeastern United States by all entities has been below the level where a population decline would occur.

Table 35 – Herring gull take by all entities in New Jersey authorized by the USFWS

Year[1]	No. of Permits	Authorized Take	Reported Take	Authorized Nests	Nests Destroyed
2003	5	220	0	100	0
2004	5	250	44	100	0
2005	6	300	45	100	0
2006	9	365	68	104	0
2007	8	400	75	100	0
2008	7	410	66	100	0

[1]Reported by calendar year

The EA evaluated an annual take of up to 250 herring gulls and up to 100 nests and/or eggs by WS in New Jersey to alleviate damage which was based on prior requests for assistance received before the development of the EA. Under the proposed supplement to the EA, the take of herring gulls could increase to an annual take level of up to 400 herring gulls. The number of nests and/or eggs taken would remain as addressed in the EA (USDA 2003).

As stated previously, the average number of herring gulls lethally taken by all entities in the northeastern United States has been 3,171 herring gulls from 2003 through 2007. Based the allowable harvest level of herring gulls derived using the PBR model, the proposed increased take level of up to 400 herring gulls when combined with the range of take that has occurred previously and the average total take of herring gulls from 2003 through 2007 would not reach a level where the take would cause a population decline. The PBR model predicts that to maintain current herring gull population levels over 16,000 herring gulls could be lethally taken annually in BCR 14 and BCR 30. Even with the increased take of up to 400 herring gulls in New Jersey proposed under this supplement, the take by all entities, including the proposed increased take in this supplement, would not reach a level that the model predicts would cause a decline in the herring gull population. The annual take of herring gulls from 2003 through 2007 and the average annual take of herring gulls by all entities have not reached a level that the model predicts would cause a decline in the herring gull population. When the take of up to 400 herring gulls annually by WS in New Jersey as proposed in the supplement is included with current take levels of herrings, the total level of take does not even reach a magnitude that the model predicts could be taken to induce an increasing population.

Herring gulls are protected from lethal take under the MBTA. However, take of gulls can occur when authorized by the USFWS pursuant to the Act through the issuance of depredation permits. Therefore, gulls are taken in accordance with applicable state and federal laws and regulations authorizing take of migratory birds; and their nest and eggs, including the USFWS. The USFWS, as the agency with migratory bird management responsibility, could impose restrictions on take as needed to assure cumulative take does not adversely affect the continued viability of populations. This should assure that cumulative impacts on herring gull populations would have no significant adverse impact on the quality

of the human environment.

WS' take along with take by other entities is expected to continue to be insignificant to the overall viability and reproductive success of herring gull populations on a local, regional, and nationwide scale. Known take of herring gulls is below the level that the PBR model predicts will cause a decline in the population in the northeastern United States from take permitted by the USFWS. WS' take of herring gulls in New Jersey under the proposed action in the EA since FY 2003 has not reached a level that would indicate an adverse impact has or will occur from WS' activities. WS' take of herring gulls along with take by other entities in New Jersey will have no adverse impact on herring gull populations in the State. The permitting of take by the USFW provides outside evaluation to ensure WS' take occurs within the allowed limits to achieve population objectives.

Great Black-backed Gull Population Impact Analysis

Great black-backed gulls nest along the coast from southern Greenland to North Carolina. As reported by the BBS, populations of great black-backed gulls in the Eastern BBS Region and USFWS Region 5 have decreased annually at rates of -2.9%, and -2.7%, respectively, from 1966-2007 (Sauer et al. 2008). In New Jersey, the number of great black-backed gulls observed during the breeding season has increased since 1966 estimated at 90.4% (Sauer et al. 2008). The number of great black-backed gulls observed overwintering in the State since 1966 has been stable to slightly increasing (National Audubon Society 2002).

According to the USFWS (2008), great black-backed gulls are considered a species of lowest concern in BCR 30 and of low concern in BCR 14. Over 37,000 great black-backed gulls are believed to breed in BCR 30 with over 115,000 great black-backed gulls nesting in BCR 14. Of those, over 43,500 occur in the Gulf of Maine, which includes New Jersey. To maintain the current population levels in BCR 14 and BCR 30, the PBR model developed by the USFWS predicts take of 11,234 great black-backed gulls, using parameters in Table 36, would not cause a decline in great black-backed gull populations in BCR 14 or BCR 30 (see Table 37).

Table 36 - Demographic parameter estimates (θ) used for estimating R_{max} and Potential Biological Removal of great black-backed gulls in BCR 14 and BCR 30 (Seamans et al. 2007).

		Great black-backed Gulls[1]	
Parameter	**Age class**	**(θ)**	**SE (θ)**
p	Adult	0.87	0.03
$l\alpha$	Adult	0.42	
	Hatch Year	0.729	0.035
	Second Year	0.886	0.024
b		0.784	0.018
α		5	
ω		19	
N_{min}		250,000	
R_{max}		0.09	0.027

[1]Good 1998

As shown in Table 38, from FY 2003 through FY 2008 WS has taken one great black-backed gull in the State with take only occurring in FY 2003. No great black-backed gull nests or eggs were destroyed by WS from FY 2003 through FY 2008.

Table 37 - Potential Biological Removal (± 95% CI) of great black-backed gulls in BCR 14 and BCR 30 under 3 recovery factors (Seamans et al. 2007)

Species	Recovery Factor		
	$F_R = 0.5$	$F_R = 1.0$	$F_R = 1.5$
Great Black-backed Gull	5,614 (2,764 – 8,358)	11,234 (5,561 – 16,670)	16,853 (8,364 – 25,086)

Great black-backed gulls taken by all entities in New Jersey from 2003 through 2008 including the number of nests and eggs destroyed are shown in Table 39. The USFWS has authorized the take of up 175 great black-backed gulls in the State to alleviate damage and reduce risks to human safety. No great black-backed gulls have been lethally taken in New Jersey from 2003 through 2008 except for the one gull taken by WS in FY 2003.

Table 38 – Great black-backed gull take by WS in New Jersey from FY 2003 through FY 2008

FY	Dispersed	Take	Nests Destroyed
2003	5	1	0
2004	7	0	0
2005	0	0	0
2006	0	0	0
2007	0	0	0
2008	0	0	0

From 2003 through 2008, the number of great black-backed gulls taken in the northeastern United States (USFWS Region 5) has ranged from 404 to 1,203 gulls with an average of 814 great black-backed gulls taken annually by all entities. The average annual take of great black-backed gulls in USFWS Region 5 by all entities authorized to take gulls through depredation permits is below the level of annual take required to maintain current population levels based on the allowable take predicted in the PBR model. To cause a population decline, the PBR model estimates that nearly 17,000 great black-backed gulls would have to be taken annually in the region. According to the PBR model, the average annual take by all entities in USFWS Region 5 is below the allowable harvest for great black-backed gull populations to increase.

Table 39 – Great black-backed gull take in New Jersey from 2003 through 2008 by all entities

Year[1]	No. of Permits	Authorized Take	Reported Take	Nests Destroyed
2003	3	130	1	0
2004	4	160	0	0
2005	3	130	0	0
2006	4	155	0	0
2007	5	165	0	0
2008	4	175	0	0

[1]Report by calendar year

Based on the best available information, WS' proposed take of up to 400 great black-backed gulls in New Jersey will not adversely affect the statewide population nor would WS' activities to alleviate damage caused by great black-backed gulls have a cumulative impact on populations. Based on the allowable take predicted by the PBR model and the annual take by all entities in the northeastern United States, the proposed increased take levels addressed in this supplement will not reach a magnitude where a decline in the great black-backed gull population would occur from depredation take. The permitting of take by the

USFWS provides outside evaluation to ensure WS' take occurs within the allowed limits to maintain viability and growing populations. The USFWS, as the agency with migratory bird management responsibility, could impose restrictions on take as needed to assure cumulative take does not adversely affect the continued viability of populations. This should assure that cumulative impacts on great black-back gull populations would have no significant adverse impact on the quality of the human environment. WS' take of great black-backed gull nests and eggs will remain as analyzed in the EA (USDA 2003).

Mourning Dove Population Impact Analysis

Based on the number of requests received prior to the development of the EA, an annual take of up to 50 morning doves in the State by WS to alleviate damage using an integrated approach was analyzed in the EA (USDA 2003). As the number of requests for assistance to manage threats to property and human safety increases, the number of mourning doves addressed in the State at airports is also likely to increase. Similar to the other wildlife species addressed in the supplement to the EA, an increase in the number of mourning doves addressed using non-lethal methods will not adversely affect mourning dove populations since those birds are generally unharmed. Dispersal activities will not occur over large geographical areas of that State that would prevent access of to food, shelter, or nesting resources that would lead to an adverse affect on statewide populations.

As discussed previously, mourning doves are present in New Jersey all year with peak numbers occurring during the spring and fall migration periods. Although the harvest of mourning doves is not permitted in the State during a hunting season, mourning doves are considered a harvestable bird species in many other States. The 2008 harvest of mourning doves in the United States has been estimated at 17.4 million doves (Raftovich et al. 2009).

In addition to take during the hunting season, the USFWS can authorize the take of mourning doves pursuant to the MBTA through the issuance of depredation permits to alleviate damage and threats of damage. In 2006, six mourning doves were lethally taken in the State under depredation permits issued by the USFWS. In 2007, nine mourning doves were lethally taken to alleviate damage while 83 doves were lethally taken in 2008. From 2005 through 2008, no mourning dove nests or eggs have been destroyed. Currently, information from 2003 and 2004 on the number of mourning doves taken under depredation permits in the State is not available from the USFWS.

As discussed previously, the number of doves observed in the State during the breeding season is showing a general stable to increasing annual trend since 1966 with a similar trend observed for doves across the eastern United States. From 1999 through 2008, the number of mourning doves heard per route during mourning dove surveys in New Jersey has shown a decrease in the State (Dolton et al. 2008). The number of doves observed overwintering in the State has shown a general stable trend since 1966 (National Audubon Society 2002). The number of doves breeding in the State has been estimated at 270,000 doves (Rich et al. 2004).

Based on increasing requests for assistance from airports in the State, WS anticipates the take of mourning doves as part of an integrated approach to resolve those requests will also increase. To alleviate damage and threats, WS anticipates take of mourning doves annually in the State could increase to 150 doves lethally taken by WS annually.

Based on a dove population estimated at 270,000 doves in the State and the stable trend for mourning doves in the State observed during the BBS and the CBC, WS' total take of up to 150 doves annually would represents 0.06% of the estimated statewide population. When compared to the estimated statewide population of mourning doves and when compared to the number of mourning doves harvested

in the United States annually, WS' take in New Jersey of up to 150 doves annually could be considered as being of low magnitude.

Take of mourning doves by WS in New Jersey will not occur unless authorized by the USFWS through the issuance of depredation permits. The USFWS will be responsible for determining the appropriate level of take of mourning doves to achieve objectives established for dove populations by evaluating mortality from all known sources, including take by WS, when issuing depredation permits. Therefore, when WS' take of mourning doves occurs within permitted levels, WS' take will be a part of management objectives established for morning doves in the State.

Disease Surveillance and Monitoring

The ability to efficiently conduct surveillance for and detect diseases is dependent upon rapid detection of the pathogen if it is introduced. Effective implementation of a surveillance system will facilitate planning and execution at regional and state levels, and coordination of surveillance data for risk assessment. It will also facilitate partnerships between public and private interests, including efforts by federal, state, and local governments as well as non-governmental organizations, universities, and other interest groups.[9] Current information on disease distribution and knowledge of the mixing of birds in migratory flyways has been used to develop a prioritized sampling approach based on the major North American flyways. Surveillance data from all of those areas will be incorporated into national risk assessments, preparedness and response planning to reduce the adverse impacts of a disease outbreak in wild birds, poultry, or humans.

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

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

Surveillance in Live Wild Birds: This strategy involves sampling live-captured, apparently healthy birds to detect the presence of a disease. Bird species that represent the highest risk of being exposed to, or infected with, the disease because of their migratory movement patterns (USDA 2005), or birds that may be in contact with species from areas with reported outbreaks will be targeted. Where possible, this sampling effort will be coordinated with local projects that already plan on capturing and handling the desired bird species. Coordinating sampling with ongoing projects currently being conducted by state and federal agencies, universities, and others maximizes use of resources and minimizes the need for additional bird capture and handling.

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

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

Sentinel Species: Waterfowl, gamefowl, and poultry flocks reared in backyard facilities may prove to be valuable for early detection and used as for surveillance of diseases. Sentinel duck flocks may also be placed in wetland environments where they are potentially exposed to and infected with disease agents as they commingle with wild birds.

Environmental Sampling: Many avian diseases are released by waterfowl through the intestinal tract and can be detected in both feces and the water in which the birds swim, defecate, and feed. This is the principal means of virus spread to new birds and potentially to poultry, livestock, and humans. Analysis of water and fecal material from certain habitats can provide evidence of diseases circulating in wild bird populations, the specific types of diseases, and pathogenicity. Monitoring of water and/or fecal samples gathered from habitat is a reasonably cost effective, technologically achievable means to assess risks to humans, livestock, and other wildlife.

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

Issue 2 - Effects on Other Wildlife Species, Including Threatened and Endangered Species

The issue of non-target species effects, including effects on threatened and endangered species arises from the use of non-lethal and lethal methods identified in the alternatives. The use of non-lethal and lethal methods has the potential to inadvertently disperse, capture, or kill non-target wildlife. WS' minimization measures and Standard Operating Procedures are designed to reduce the effects of damage management activities on non-target species' populations which were discussed in WS' programmatic FEIS (USDA 1997) and the EA (USDA 2003). To reduce the risks of adverse affects to non-target wildlife, WS selects damage management methods that are as target-selective as possible or applies such methods in ways that reduces the likelihood of capturing non-target species. Before initiating management activities, WS also selects locations which are extensively used by the target species and employs baits or lures which are preferred by those species. Despite WS' best efforts to minimize non-target take during program activities, the potential for adverse affects to non-targets exists when applying both non-lethal and lethal methods to manage damage or reduce threats to safety.

Non-lethal methods have the potential to cause adverse affects on non-targets primarily through exclusion, harassment, and dispersal. 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, non-target species excluded from areas may potentially be adversely impacted if the area excluded is large enough. The use of auditory and visual dispersal methods used to reduce damage or threats caused by target species are also likely to disperse non-targets in the immediate area where the methods are employed. However, the potential impacts on non-target species are expected to be temporary with target and non-target species often returning after the cessation of dispersal methods.

The lethal take of non-targets from using those methods described in the EA is unlikely with take never reaching a magnitude that a negative impact on populations would occur. Any potential non-targets live-

captured using non-lethal methods would be handled in such a manner as to ensure the survivability of the animal when released. The use of firearms is selective for target species since animals are identified prior to application; therefore, no adverse impacts are anticipated from use of this method. The use of chemical methods, when used according to label directions, poses minimal hazards to non-target wildlife (USDA 1997).

Non-target Species Analysis from WS' Activities in the State from FY 2003 through FY 2008

While every precaution is taken to safeguard against taking non-targets during operational use of methods and techniques for resolving damage and reducing threats caused by wildlife, the use of such methods can result in the incidental take of unintended species. Those occurrences are minimal and should not affect the overall populations of any species. Since FY 2003, no non-target species were lethally taken during WS' bird damage management activities in New Jersey. WS' take of non-target species during activities to reduce damage or threats to human safety caused by birds is expected to continue to be extremely low to non-existent. WS will continue to monitor annually the take of non-target species to ensure program activities or methodologies used in damage management activities do not adversely impact non-targets.

The EA concluded that WS' damage management activities would have no adverse affects on other wildlife species (non-target), including threatened and endangered species throughout the State when those activities were conducted within the scope analyzed in the EA. Methods used by WS are essentially selective for target species when applied appropriately. In addition, WS adheres to those minimization measures and procedures discussed in the EA to minimize the potential for non-target take. As discussed previously, the primary methods used during direct operational assistance by WS from FY 2003 through FY 2008 to resolve requests for assistance were non-lethal harassment techniques, shooting with firearms, euthanizing birds live-captured in cage traps, and the use of DRC-1339.

Non-target Species Impact Analysis under the Proposed Supplement to the EA

The supplement to the EA evaluates those activities conducted by WS pursuant to the proposed action in the EA to resolve an increasing number of requests to manage damage or threats of damage to resources associated with mallards, osprey, wild turkeys, killdeer, ring-billed gulls, herring gulls, great black-backed gulls, and mourning doves. WS' response to an increasing number of requests for direct operational assistance will result in the increased use of methods to resolve those requests. The number of methods employed to resolve the increasing requests for assistance could also increase under the proposed supplement to the EA. In addition, the frequency of individual method application to resolve requests for assistance is also likely to increase.

As shown in previous tables, the lethal take of mallards, wild turkeys, killdeer, gulls, and morning doves from FY 2003 through FY 2008 has occurred using firearms only. Shooting is essentially effective for target species since identification of the target occurs prior to the application of the method. Therefore, any increase in the use of a firearm to resolve damage and threats associated with those activities described in the supplement to the EA would not result in adverse affects to non-targets since no lethal take of non-targets has occurred previously or is expected to occur from the use of firearms.

Other methods that could be used to lethally take mallards, turkeys, killdeer, gulls, and doves include euthanasia after those bird species have been live-capture using methods described in Appendix B of the EA (*e.g.*, live-traps, nets). Live-capture methods allow for the release of non-target wildlife if captured since those methods either require WS' personnel to be present during the application of the methods or are monitored frequently. An increase in the use of live-traps to address increasing requests for assistance would not adversely affect non-target bird species since non-targets could be released on site if live-captured. Euthanasia methods approved by the AVMA for free-ranging birds which are employed by WS

are selective for target species.

The chemical method DRC-1339 is also available to lethally take herring gulls, ring-billed gulls, and great black-backed gulls in the State. WS has not previously used DRC-1339 to take gulls in the State. However, DRC-1339 has been used to lethally take European starlings by WS. No non-targets were known to be taken during the application of DRC-1339 by WS for starlings in the State. The label registration for DRC-1339 for gulls limits the use of the product to WS' employees only. Several minimization measures are incorporated into the label of DRC-1339 for gulls to reduce risks to non-targets. As required by the label, all sites are pre-baited and monitored for non-target use as outlined in the pre-treatment observations section of the label. If non-targets were observed feeding on the pre-bait, the plots would be abandoned and no baiting would occur at those locations. All uneaten treated baits must be retrieved to minimize non-target exposure. Following the label requirements of DRC-1339 for gulls ensures risks to non-targets are minimal.

Under the proposed action, WS incorporates lethal and non-lethal methods to resolve damage and threats of damage. As described previously, WS has employed primarily pyrotechnics to disperse birds from areas where damage has occurred or could occur. Under the proposed supplement to the EA, the frequency of pyrotechnic use could increase as WS addresses an increase in the number of requests for assistance. Non-target species are usually not affected by WS' non-lethal management activities, except for the occasional scaring from harassment devices. In those cases, migratory birds and other affected non-target wildlife may temporarily leave the immediate vicinity but would most likely return after conclusion of the action. Because non-lethal methods are intended to disperse wildlife unharmed from areas where those methods are applied, an increase in the use of those methods to disperse birds will not adversely affect non-target wildlife. The increase in use of those methods would not reach a magnitude that would adversely affect non-target wildlife populations.

Threatened and Endangered Species Analysis

A review of threatened and endangered (T&E) species listed by the USFWS, the National Marine Fisheries Service, and the NJDFW showed that additional listings of T&E species have occurred since the completion of the EA. Additional species federally-listed in New Jersey since the Decision/FONSI was signed for the EA in 2003 include the Eskimo curlew (*Numenius borealis*), listed as endangered, and the eastern prairie fringed orchid (*Platanthera leucophaea*), listed as threatened. The Eskimo curlew and the eastern prairie fringed orchid are listed in New Jersey, but are not known to currently occur in the State. Based on the absence of those species from the State, WS has determined that bird damage management activities described in the EA and the proposed supplement to the EA will have no effect on those species. The red knot (*Calidris canutus rufa*), bog asphodel (*Narthecium americanum*), and Hirsts' panic grass (*Dichanthelium hirstii*) are currently candidate species for federal listing in New Jersey.

WS' activities as described in the EA and in the proposed supplement to the EA are not those that cause major habitat disturbances or degradation. Therefore, WS has determined that activities as described in the EA and the supplement to the EA will have no effect on bog asphodel and Hirsts' panic grass. Red knots are long distance migrants that pass through New Jersey during spring and fall migration periods. During their migrations, red knots are found primarily in marine and estuarine habitats (Harrington 2001). Based on requests for assistance received previously by WS in New Jersey, the habitat in which red knots are found, and the limited time red knots are present in the State, WS has determined that the proposed action in the EA and this supplement to the EA will have no effect on red knots if listing occurs.

WS' program activities in New Jersey to manage damage caused by birds have not changed from those described in the EA except for those aspects addressed in the supplement to the EA. Thus, the determination in the EA made by WS for those species listed during the development of the EA is still

appropriate (USDA 2003). WS has reviewed those activities addressed in the supplement to the EA and has determined those activities will have no effect on T&E species listed in the State. For those species listed and proposed for listing in New Jersey since the completion of the EA, WS has determined that the proposed action in the EA and the proposed supplement to the EA will have no effect on those species. Program activities and their potential impacts on other wildlife species, including T&E species have not changed from those analyzed in the EA. Impacts of the program on this issue are expected to remain insignificant.

Since the completion of the EA, the queen snake (*Regina septemvittata*) has been listed by the NJDFW as endangered in the State. Based on the use patterns of the methods described in the EA to address bird damage management as employed under the proposed action, including the proposed supplement to the EA, the proposed action in the EA and the proposed supplement to the EA will have no effect on the queen snake in the State.

Issue 3 - Effects on Human Health and Safety

Based on the analyses in the EA and WS' programmatic FEIS, when WS' activities are conducted according to WS' directives and standard operating procedures; federal, state, and local laws; and label requirements, those activities pose minimal risks to human safety (USDA 1997, USDA 2003). The analyses in the EA also concluded that WS' activities to reduce threats and hazards associated with birds were likely to have positive impacts to human health and safety by addressing safety issues and disease transmission associated with those birds. Positive benefits would include reducing threats associated with work place safety caused by accumulations of bird feces under bird roosts in areas where people work and are likely to encounter feces or surfaces contaminated with bird feces. Other positive impacts include reducing potential bird strikes at airports. Bird strikes with aircraft can lead to extensive damage to aircraft and can threaten passenger safety.

Human Safety Analysis from WS' Activities in the State from FY 2003 through FY 2008

Management activities conducted by WS from FY 2003 through FY 2008 did not result in any injuries or illness to any members of the public or to WS' personnel. No injuries or illness from WS' activities were reported to WS from FY 2003 through FY 2008. WS' program activities had a positive impact in those situations that reduced the risks of potential injury, illness, and loss of human life from injurious bird species. The EA concluded that an integrated approach to wildlife damage management had the greatest potential of successfully reducing potential risks to human health and safety in New Jersey.

Human Safety Analysis under the Proposed Supplement to the EA

The supplement to the EA evaluates the implementation of the proposed action to address an increasing number of requests for assistance to manage damage and threats associated with mallards, osprey, turkeys, killdeer, gulls, and morning doves which could result in methods being employed with more frequency to resolve damage. Those methods described in the EA inherently pose minimal risks to human safety when used appropriately and in consideration of human safety. WS will continue to incorporate those minimization measures described in the Chapter 3 in the EA into the bird damage management activities which will minimize the risks to human safety. Based on the use patterns of the methods available, an incretion in the use of those methods to address those activities described in the supplement to the EA pertaining to an increase in activities involving mallards, osprey, turkeys, killdeer, gulls, and morning doves will not increase risks to human safety. WS' employees are training in the proper use of methods to ensure the safety of the employee and the public. No adverse affects to human safety have occurred or have been reported to occur from WS' activities conducted from FY 2003 through FY 2008. An increase in the number of methods used or an increase in the frequency that a method is

used will not increase risks to human safety when consideration of human safety is part of the use pattern associated with those methods.

Issue 4 - Impacts to stakeholders, including aesthetics

As described in the EA, WS would employ methods when requested that would result in the dispersal, exclusion, or removal of individuals or small groups of target bird species to resolve damage and threats. In some instances where birds are dispersed or removed, the ability of interested persons to observe and enjoy those birds will likely temporarily decline. However, the bird populations in those areas will likely increase upon cessation of damage management activities.

Even the use of exclusionary devices can lead to the dispersal of birds if the resource being damaged was acting as an attractant. Thus, once the attractant has been removed or made unavailable, birds will likely disperse to other areas where resources are more vulnerable making them unavailable for viewing or enjoyment.

Impacts to Stakeholders Analysis from WS' Activities in the State from FY 2003 through FY 2008

The EA concluded the affects on aesthetics would be variable depending on the damage situation, stakeholders' values towards wildlife, and their compassion for those who are experiencing damage from birds. The WS program in New Jersey only conducts activities at the request of the affected property owner or resource manager. Upon receiving a request for assistance, WS addresses issues/concerns and explanations are given for the reasons why a particular method or group of methods would be the most effective in reducing damage for the specific situation. Methods employed to reduce or resolve damage is agreed upon by the cooperator according to a cooperative service agreement.

Information in the summary report and supplement to the EA indicates that WS' take of bird species have been minimal and of a low magnitude when compared to the populations of those species. WS' take has not reached a magnitude of take that would severely limit the ability to view and enjoy birds. Only those birds identified as causing damage were targeted by WS during damage management activities and only after a request for such action was received. WS addressed most birds using non-lethal harassment methods to alleviate damage and threats which disperses birds from those areas. Similarly, the use of lethal methods removes those birds associated with the damage. However, birds can be viewed outside the area where damage management activities were conducted if a reasonable effort is made to locate those birds outside of the damage management area. WS receives requests to conduct damage management activities on only a small portion of the land area in New Jersey. Therefore, activities are not conducted over large areas that would greatly limit the aesthetic value of birds.

Impacts to Stakeholders Analysis under the Proposed Supplement to the EA

The increased take of those species addressed in the supplement to the EA would result in a greater number of birds being lethally taken at a location or would result in an increase in the number of locations where birds are lethally removed. The use of lethal methods would result in temporary declines in local populations resulting from the removal of target bird species to resolve requests for assistance. WS' goal is to respond to requests for assistance and to manage those birds responsible for the resulting damage. Therefore, the ability to view and enjoy birds in New Jersey will still remain if a reasonable effort is made to locate birds outside the area in which damage management activities occurred.

The ability to view and enjoy the aesthetic value of birds at a particular site would be somewhat limited if the birds were removed as part of an integrated approach to managing damage. However, new birds would most likely use the site in the future, although the length of time until these birds arrive is variable,

depending on the site, time of year, and population densities of those birds in the surrounding areas. The opportunity to view birds is available if a person makes the effort to visit sites outside of the damage management area.

As shown under Issue 1, the magnitude of WS' proposed take of birds under the supplement to the EA could be considered a low if take levels occurred at the levels proposed. WS' proposed activities addressed in the proposed supplement would not result in declines of bird populations over a large geographical area but would be limited to site specific locations where bird damage has occurred or is likely to occur. Therefore, even with the proposed increased take of birds under the supplement, those bird populations would remain high in the State and the aesthetic value of those species could be enjoyed if a reasonable attempt is made to locate those birds outside of the damage management area.

Issue 5 - Humaneness and Animal Welfare Concerns of Methods Used

As discussed in the EA, humaneness, in part, appears to be a person's perception of harm or pain inflicted on an animal. People may perceive the humaneness of an action differently. The challenge in coping with this issue is how to achieve the least amount of animal suffering within the constraints imposed by current technology and funding.

Some individuals believe any use of lethal methods to resolve damage associated with wildlife is inhumane because the resulting fate is the death of the animal. Others believe that certain lethal methods can lead to a humane death. Others believe most non-lethal methods of capturing wildlife to be humane because the animal is generally unharmed and alive. Still others believe that any disruption in the behavior of wildlife is inhumane. With the varied attitudes on the meaning of humaneness, the analyses must consider the most effective way to address damage and threats caused by wildlife in a humane manner. WS is challenged with conducting activities and employing methods that are perceived to be humane while assisting those persons requesting assistance to manage damage and threats associated with wildlife. The goal of WS is to use methods as humanely as possible to effectively resolve requests for assistance to reduce damage and threats to human safety. WS continues to evaluate methods and activities to minimize the potential pain and suffering of wildlife when attempting to resolve requests for assistance.

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

Therefore, WS' mission is to effectively address requests for assistance using methods in the most humane way possible that minimize the stress and pain of the animal. WS' personnel are experienced and professional in their use of management methods, and methods are applied as humanely as possible.

Humaneness Analysis from WS' Activities in the State from FY 2003 through FY 2008

Methods used in bird damage management activities in New Jersey from FY 2003 through FY 2008 and their potential impacts on humaneness and animal welfare did not changed from those analyzed in the EA. All methods employed by WS from FY 2003 through FY 2008 to alleviate bird damage were discussed in the EA (USDA 2003). WS continued to employ methods as humanely as possible to minimize distress. Live-captured birds addressed in the EA were euthanized using methods considered appropriate for wild birds by the AVMA. Therefore, the analyses of the humaneness of methods used by WS to manage damage and threats caused by birds from FY 2003 through FY 2008 did not changed from those analyzed in the EA.

Humaneness Analysis under the Proposed Supplement to the EA

Since those methods described in Appendix B of the EA would continue to be available under the proposed supplement to the EA, the issue of humaneness would be similar despite the frequency of the use of methods increasing. Those methods considered inhumane by certain segments of society would be considered inhumane no matter the frequency of the use of those methods. Those methods considered inhumane that were addressed in the EA would continue to be considered inhumane under the supplement to the EA. Therefore, the analyses in the EA for the humaneness of methods would not change under the supplement to the EA. WS will continue to employ methods as humanely as possible and would continue to employ euthanasia methods recommended for wild birds by the AVMA. Since the completion of the EA, the reproductive inhibitor nicarbazin has been registered for use to manage pigeon populations. The issue of humaneness and the use of nicarbazin will be further address in following sections (see Section XII).

IX. ISSUES ADDRESSED BUT NOT IN DETAIL

In addition to the identified major issues considered in detail, three other issues were considered in section 2.3 of the EA, but were not analyzed in detail with the rationale provided in the EA. WS has reviewed the issues not considered in detail as described in the EA and has determined that the analyses provided in the EA is still appropriate regarding those issues.

X. ALTERNATIVES ANALYZED IN DETAIL

The alternatives considered and evaluated using the identified issues are described and discussed in detail in Chapter 3 of the EA (USDA 2003). In addition, the EA contains a detailed description and discussion of the alternatives and the effects of the alternatives on the issues identified (USDA 2003). Appendix B of the EA provides a description of the methods that could be used or recommended by WS under each of the alternatives. The EA describes four potential alternatives that were developed to address the issues identified above. Alternatives analyzed in detail include:

Alternative 1 - Technical Assistance Only
Alternative 2 - Integrated Bird Damage Management Program (Proposed Action/No Action)
Alternative 3 - Non-lethal Bird Damage Management Only By WS
Alternative 4 - No federal WS Bird Damage Management

XI. ALTERNATIVES CONSIDERED BUT NOT ANALYZED IN DETAIL

Three additional alternatives were considered, but not analyzed in detail in the EA. Alternatives considered but not analyzed in detail are discussed in Section 3.3 of the EA (USDA 2003). WS has reviewed the alternatives not analyzed in detail in the EA and has determined that the analyses provided in the EA have not changed and are still appropriate.

XII. WILDLIFE DAMAGE MANAGEMENT METHODS

A description of the wildlife damage management methods that could be used or recommended by WS is provided in Appendix B of the EA (USDA 2003) and in Appendix J of WS' programmatic FEIS (USDA 1997). Since the completion of the EA, the avian reproductive inhibitor nicarbazin has been registered for use to manage damage associated with pigeons. Under the proposed action in the EA, nicarbazin could be used or recommended as part of an integrated damage management strategy to alleviate bird damage. Nicarbazin is a restricted-use pesticide that requires a pesticide applicators license to purchase and use.

Since nicarbazin is registered for use in New Jersey, anyone with the appropriate pesticide applicators license can purchase and use nicarbazin to manage pigeon damage. Nicarbazin would be available for use by pesticide applicators under any of the alternatives analyzed in the EA. Similarly, the potential impacts on the identified issues would be similar amongst those issues. The use of nicarbazin is discussed in relationship to the use of the product under the proposed action as related to the five identified issues.

Nicarbazin

Since the completion of the EA, a product with the reproductive inhibitor known as nicarbazin has been registered for use in New Jersey to manage pigeon populations by reducing the likelihood that eggs laid by pigeons will hatch. Nicarbazin is a complex of two compounds, 4,4'-dinitrocarbanilide (DNC) and 4,6-dimethyl-2-pyrimidinol (HDP) which interferes with the formation of the vitelline membrane that separates the egg yolk and egg white which prevents the development of an embryo inside the egg (EPA 2005). The active component of nicarbazin is the DNC compound with the HDP compound aiding in absorption of DNC (EPA 2005). Nicarbazin was first developed to treat coccidiosis[10] outbreaks in broiler chickens and has been approved as a veterinary drug by the Food and Drug Administration (FDA) since 1955 for use in chicken feed to prevent the fungal disease coccidiosis (EPA 2005).

Nicarbazin, as a reproductive inhibitor for pigeons, has been registered with the Environmental Protection Agency (EPA) as a pesticide pursuant to the Federal Insecticide, Fungicide, Rodenticide Act under the trade name OvoControl® P (Innolytics, LLC, Rancho Sante Fe, CA). OvoControl® P (EPA Reg. No. 80224-1) is a restricted use pesticide registered for use in New Jersey for reducing the egg hatch of urban pigeons. The formulation for pigeons contains 0.5% of the active ingredient nicarbazin by volume as a ready-to-use bait for pigeons in urban areas only. Urban areas have been defined by the EPA as municipalities and surrounding areas with a population of 50,000 or more people. Baiting can only occur by applicators certified by the State and only on rooftops or other flat paved or concrete surfaces such as buildings, office parks, malls, hospitals, bridges, airports, tunnels, and commercial sites.

Since OvoControl® P is commercially available to those with a certified applicators license, the use of the product could occur under any of the alternatives discussed in the EA and therefore, the effects of the use would be similar across all the alternatives. Under the proposed action, WS could use or recommend nicarbazin under the trade name OvoControl® P as part of an integrated approach to managing damages associated with pigeons. WS' use of nicarbazin under the proposed action would not be additive since the use of the product could occur from other sources, such as private pest management companies or those experiencing damage could become a certified applicator and apply the bait themselves.

Population management from the use of reproductive inhibitors occurs through a reduction in the recruitment of new birds into the population by limiting reproductive output. A reduction in the population occurs when the number of birds being recruited into the population can not replace those individuals that die from other causes each year which equates to a net loss in the number of individuals in the population leading to a reduction in the population. Although not generally considered a lethal method since no direct take occurs, reproductive inhibitors can result in the reduction of a target species' population. WS' use or recommendation of nicarbazin would target local pigeon populations identified as causing damage or threatening human safety. Although a reduction in pigeon populations would likely occur from constant use of nicarbazin, the actual reduction in the population annually would be difficult to derive prior to the initiation of the use of nicarbazin.

[10]Coccidiosis is a fungal pathogen known to infect birds and livestock causing diarrhea, dehydration, and can prevent proper growth of livestock. For more information on coccidiosis, see the EA (USDA 2003).

One of the difficulties in calculating an actual reduction in a targeted population prior to application of the bait is that consumption of nicarbazin treated bait as currently formulated does not appear to completely eliminate egg hatch in pigeons. Current studies on nicarbazin as a reproductive inhibitor for pigeons has shown variability in hatch rates of pigeons fed treated baits. In addition, pigeons must consume bait treated with nicarbazin daily in the correct dosage throughout the breeding season to achieve the highest level of effectiveness in reducing egg hatch. Pigeons can breed year-around with peak breeding occurring from February through October (Johnston 1992). Giunchi et al. (2007) found that when pigeons were fed treated baits (800 parts per million (ppm)) the number of hatchlings produced declined between 13% and 48% compared to a control group. When pigeons were fed doses of nicarbazin treated bait daily in cage studies at the levels currently found in OvoControl® P (5,000 ppm), Avery et al. (2008) found that the rate of egg hatch was reduced by 59% in captive pigeons. In simulating a 50% reduction in egg hatch, Giunchi et al. (2007) predicted through modeling that a population of 5,000 pigeons would be reduced by half if a 50% reduction in pigeon egg hatch occurred annually over a five-year period. The same population would rebound back to 5,000 individuals within five years if egg hatch returned to normal.

Since the effects of nicarbazin on egg hatch are reversible if no longer provided for consumption (Avery et al. 2006, Giunchi et al. 2007, Avery et al. 2008), the reduction in the local pigeon population from the use of nicarbazin can be maintained at appropriate levels where damages or threats are resolved by increasing or decreasing the amount of nicarbazin treated bait available to target pigeons. Although localized pigeon populations would likely be reduced from the use of nicarbazin, the extent of the reduction would be variable given the uncertainty in effectiveness of nicarbazin to reduce egg hatch in pigeons. When pigeons were provided nicarbazin in cage trials at dosage levels found formulated in OvoControl® P (5,000 ppm), not all eggs laid were infertile with 41% of the eggs producing apparently healthy chicks (Avery et al. 2008).

Label requirements of OvoControl® P restrict the application of the product to urban areas where treated bait can be placed on rooftops or other flat, concrete surfaces which further limits the extent of the products use for reducing pigeon populations. Based on current information, WS' use or recommendation of nicarbazin formulated under the trade name OvoControl® P will not adversely affect pigeon populations in New Jersey since WS' activities will not be additive to those activities that could occur in the absence of WS' use of the product. The use of nicarbazin by WS would only occur when permitted under State statutes. The resultant reduction in the pigeon population from the use of nicarbazin would be highly variable given the variability in the effectiveness of the product to reduce egg hatch in pigeons. However, given that the effects of nicarbazin are only temporary if birds are not fed an appropriate dose of nicarbazin daily, the reduction in the population could be fully reversed if treated bait is no longer supplied and other conditions (*e.g.*, food, disease) are favorable for population growth. As discussed previously, any reduction in local pigeon populations could be viewed as benefitting other native wildlife since pigeons can compete with native bird species for food and shelter.

The potential adverse affects to non-target wildlife are also a concern from the use of nicarbazin to manage pigeon populations. Exposure of non-target wildlife to nicarbazin could occur either from direct ingestion of the bait by non-target wildlife or from secondary hazards associated with wildlife consuming birds that have eaten treated bait. Several label restrictions of OvoControl® P are intended to mitigate risks to non-target wildlife from direct consumption of treated bait (EPA 2005). Daily observation of bait sites for pigeon and non-target activity must occur during a five to fourteen day acclimation period. The required acclimation period habituates pigeons to feeding in one location at a certain time period. Once pigeons are acclimated and no non-targets are observed feeding on the bait, observations for non-targets must occur once weekly until application of treated bait ends. During the observation periods, the applicator must be present on site until all bait has been consumed. Non-target risks are further minimized by requirements that bait only be placed on rooftops in urban areas and if not practical, baiting

is limited to paved and/or on hard concrete surfaces. All unconsumed bait must also be retrieved daily which further reduces threats of non-targets consuming treated bait.

In addition, nicarbazin is only effective in reducing the hatch of eggs when blood levels of DNC are sufficiently elevated in a bird species. When consumed by birds, nicarbazin is broken down into the two base components of DNC and HDP which are then rapidly excreted. To maintain the high blood levels required to reduce egg hatch, birds must consume nicarbazin daily at a sufficient dosage that appears to be variable depending on the bird species (Yoder et al. 2005, Avery et al. 2006). For example, to reduce egg hatch in Canada geese (*Branta canadensis*), geese must consume nicarbazin at 2,500 ppm compared to 5,000 ppm required to reduce egg hatch in pigeons (Avery et al. 2006, Avery et al. 2008). In pigeons, consuming nicarbazin at a rate that would reduce egg hatch in Canada geese did not reduce the hatchability of eggs in pigeons (Avery et al. 2006). With the rapid excretion of the two components of nicarbazin (DNC and HDP) in birds, non-targets birds would have to consume nicarbazin daily at sufficient doses to reduce the rate of egg hatching.

Secondary hazards also exist from wildlife consuming pigeons that have ingested nicarbazin. As mentioned previously, once consumed, nicarbazin is rapidly broken down into the two base components DNC and HDP. DNC is the component of nicarbazin that limits egg hatchability while HDP only aids in absorption of DNC into the bloodstream. DNC is not readily absorbed into the bloodstream and requires the presence of HDP to aid in absorption of appropriate levels of DNC. Therefore, to pose a secondary hazard to wildlife, ingestion of both DNC and HDP from a pigeon carcass would have to occur and HDP would have to be consumed at a level to allow for absorption of the DNC into the bloodstream. In addition, an appropriate level of DNC and HDP would have to be consumed from a pigeon carcass daily to produce any negative reproductive affects to other wildlife since current evidence indicates a single dose does not limit reproduction. To be effective nicarbazin (both DNC and HDP) must be consumed daily during the duration of the reproductive season to limit the hatchability of eggs. Therefore, to experience the reproductive affects of nicarbazin, a pigeon that had consumed nicarbazin would have to be consumed daily and a high enough level of DNC and HDP would have to be available in the pigeon carcass and consumed for reproduction to be affected. Based on the risks and likelihood of wildlife consuming a treated pigeon daily and receiving the appropriate levels of DNC and HDP daily to negatively impact reproduction, secondary hazards to wildlife from the use of nicarbazin are extremely low (EPA 2005).

Although some risks to other non-target species besides bird species does occur from the use of OvoControl® P, those risks are likely to be minimal given the restrictions on where bait can be applied (*e.g.*, on rooftops, on pavement at airports). Although limited toxicological information for nicarbazin exists for wildlife species besides certain bird species, available toxicology data indicates nicarbazin is relatively non-toxic to other wildlife species (World Health Organization 1998, EPA 2005, California Department of Pesticide Regulation 2007). Given the use restriction of OvoControl® P and the limited locations where bait can be applied, the risks of exposure to non-targets would be extremely low.

WS has reviewed the list of threatened and endangered species listed in New Jersey and determined that the use of nicarbazin under the trade name OvoControl® P will have no effect on those species listed in the State. Restricting the use of the product to use on rooftops and paved concrete areas where pigeons are conditioned to feed along with the bait-type (pellets) of the product and the limited availability of the product during application ensures the use of nicarbazin will have no effect on threatened and endangered species. WS' will continue to monitor pigeon damage management activities and those species listed in the State to ensure compliance with the Endangered Species Act.

Threats to human safety from the use of OvoControl® P will likely be minimal if labeled directions are followed. The use pattern of OvoControl® P will also ensure threats to public safety are minimal. Label

requirements require treated bait to be applied on rooftops of buildings or other areas restricted to public access (*e.g.*, airports). The EPA has characterized OvoControl® P as a moderate eye irritant. The FDA has established a tolerance of nicarbazin residues of 4 parts per million allowed in uncooked chicken muscle, skin, liver, and kidney (21 CFR 556.445). The EPA characterized the risks of human exposure as low for a similar product used to reduce egg hatch in Canada geese. The EPA also concluded that if human consumption occurred, a prohibitively large amount of nicarbazin would have to be consumed to produce toxic effects (EPA 2005). Based on the use pattern of the OvoControl® P and if label instructions are followed, risks to human safety will be low with the primary exposure occurring to those handling and applying the product. Safety procedures required by the label, when followed, will minimize risks to handlers and applicators.

The use of nicarbazin on the aesthetic values of pigeons occurs primarily from the inability of those interested in viewing, feeding, and photographing pigeons along with knowing pigeons are free-ranging. The aesthetic value of a local pigeon population would likely lessen from a reduction in a population that would result from the use of nicarbazin. As previously mentioned, the rate of population decline would be variable from the use of nicarbazin since effectiveness of the product varies. However, the rate of decline in a localized pigeon population is likely to occur at a gradual rate compared to other lethal removal programs that target localized pigeon populations. Giunchi et al. (2007) predicted through modeling that a population of 5,000 pigeons would be reduced by half if a 50% reduction in pigeon egg hatch occurred annually over a five-year period. However, damage would continue to occur from those pigeons which could affect the aesthetic value of property and threaten human safety if pigeon populations remain sufficient for extended periods of time. Overall, the aesthetic value of a localized pigeon population would be similar to the use of other lethal methods discussed in the EA since a population decline would occur.

The use of nicarbazin would generally be considered as a humane method of managing local populations of pigeons. Nicarbazin reduces the hatchability of eggs laid by pigeons and appears to have no adverse affects on pigeons consuming bait daily and does not appear to adversely affect those chicks that do hatch from parents fed nicarbazin (Avery et al. 2006, Avery et al. 2008). Nicarbazin has been characterized as a veterinary drug since 1955 by the FDA for use in broiler chickens to treat outbreaks of coccidiosis with no apparent ill effects to chickens. Based on current information, the use of nicarbazin would generally be considered humane based on current research.

Overall, the use of nicarbazin would have no effect on non-target wildlife that may consume bait or consume pigeons that have consumed bait, will not adversely affect human safety given the use restriction of the product that are found on the label, which if followed, will minimize human exposure to the product, will not adversely affect the aesthetic values of pigeons since pigeons are common in the State and the population decline would be gradual, and the product would likely be considered humane since only the hatching rate of eggs laid would be reduced after consumption with no apparent adverse affects to the pigeons consuming bait or the chicks that do hatch from eggs. WS' potential use of OvoControl® P under the proposed action would not adversely affect any aspect of the issues analyzed in detail in the EA and would allow for additional methods to be available for use in an integrated approach to managing damage caused by pigeons. As discussed previously, nicarbazin would only be used by WS to manage a localized pigeon population after receiving a permit from the NJDHSS or a local board of health.

XIII. MITIGATION AND STANDARD OPERATING PROCEDURES

Mitigation measures are any features of an action that serve to prevent, reduce, or compensate for effects that otherwise might result from that action. As appropriate, mitigation measures are incorporated in WS' SOPs. The current WS program, nationwide and in New Jersey, use many SOPs. SOPs are discussed in Chapter 3 (section 3.4) of the EA (USDA 2003) and Chapter 5 of WS' programmatic FEIS (USDA 1997).

The SOPs discussed in the EA remain appropriate for WS' wildlife damage management activities conducted in the State.

XIV. CUMULATIVE IMPACTS

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

WS' wildlife damage management activities would be the primary federal program with damage management responsibilities; however, other entities may conduct similar activities in New Jersey as permitted by the USFWS and the NJDFW. Through ongoing coordination with the USFWS and the NJDFW, WS is aware of such activities and may provide technical assistance in such efforts. WS does not normally conduct direct damage management activities concurrently with other entities in the same area, but may conduct activities at adjacent sites within the same timeframe. The potential cumulative impacts analyzed below could occur either as a result of WS' program activities over time or as a result of the aggregate effects of those activities combined with the activities of other agencies and individuals.

Cumulative Impacts on Wildlife Populations

Evaluation of WS' activities relative to wildlife populations indicated that program activities will likely have no cumulative adverse affects on populations in New Jersey. WS' actions would be occurring simultaneously, over time, with other natural processes and human-generated changes that are currently taking place. Those activities include, but are not limited to:

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

All those factors play a role in the dynamics of wildlife populations. In many circumstances, requests for assistance arise when some or all of those elements have contrived to elevate target species populations or place target species at a juncture to cause damage to resources. WS' actions taken to minimize or eliminate damage are constrained as to scope, duration and intensity, for the purpose of minimizing or avoiding impacts to the environment. WS evaluates damage occurring, including other affected elements and the dynamics of the damaging species; determines appropriate strategies to minimize effects on environmental elements; applies damage management actions; and subsequently monitors and adjusts/ceases damage management actions (Slate et al. 1992). This process allows WS to take into consideration other influences in the environment, such as those listed above, in order to avoid cumulative adverse impacts on target species.

No cumulative adverse impacts on wildlife populations are expected from WS' actions based on the following considerations:

Historical outcomes of WS' programs on wildlife

No cumulative adverse affects have been identified for wildlife as a result of program activities implemented over time based on analyses contained in the EA, from annual monitoring reports, or from analyses contained in the proposed supplement. WS continues to implement an integrated damage management program that adapts to the damage situation and the species involved with causing the

damage. WS only targets wildlife causing damage and only after a request for assistance is received. All program activities are coordinated with appropriate federal, state, and local entities to ensure WS' activities do not adversely impact the populations of any native wildlife species.

Since the completion of the EA, the number of species and the total number of bird species addressed by WS in New Jersey has increased annually which provides some indication that WS' activities are not cumulatively impacting populations. WS continues to implement an integrated program that employs primarily non-lethal dispersal and harassment methods. WS will continue to provide technical assistance to those persons requesting assistance to identify and alleviate damage.

SOPs and mitigation strategies built into WS' program

SOPs and mitigation measures are designed to reduce the potential negative effects of WS' actions on wildlife, and are tailored to respond to changes in wildlife populations which could result from unforeseen environmental changes. This would include those changes occurring from sources other than WS. Alterations in program activities are defined through SOPs and mitigation measures, and implementation is insured through monitoring, in accordance with WS' Decision Model (Slate et al. 1992).

Current status of potentially affected wildlife species

Natural and human-induced mortality patterns for wildlife are expected to remain essentially unchanged in New Jersey despite WS' activities. As a result, no cumulative adverse affects are expected from repetitive damage management programs over time in the fairly static set of conditions currently affecting wildlife in the State.

Migratory Bird Treaty Act, as amended

The Migratory Bird Treaty Act, as amended, places the protection of all bird species designated under the Act under the management authority of the USFWS. All take for damage management purposes is authorized by permit or order pursuant to the Act issued by the USFWS. Oversight of the allowed take of bird species by the USFWS ensures cumulative impacts are considered and addressed when determining the allowable take of bird species to ensure the viability of a population. The allowed take, including cumulative take, is analyzed and determine by the USFWS prior to the issuance of permits under the Act. Therefore, WS' allowed take, as authorized by the USFWS by permit, should not reach a level where cumulative take would adversely impact bird populations.

Cumulative Impact Potential from Chemical Components

Wildlife damage management which includes the use of pesticides as a lethal population management component may have the greatest potential for cumulative impacts on the environment. Potential impacts relate to the deposit of chemical residues in the physical environment causing environmental toxicosis.

DRC-1339 and Avitrol are the only chemicals potentially used by WS for the purpose of obtaining lethal effects on birds. Those chemicals have been evaluated for possible residual effects which might occur from buildup of the chemicals in soil, water, or other environmental sites.

DRC-1339 exhibits a low persistence in soil or water, and bioaccumulation of the chemical is unlikely (USDA 1997). Additionally, the relatively small quantity of DRC-1339 that has been or will be used to manage threats from birds, the chemical's instability which results in degradation of the product, and application protocol used in WS' activities further reduces the likelihood of any environmental

accumulation. DRC-1339 is restricted to use by USDA personnel only and is not used by any other entity in New Jersey.

Avitrol may be used or recommended by the WS' program in New Jersey. Most applications would not be in contact with soil and applications would not be in contact with surface or ground water. Uneaten baits will be recovered and disposed of according to EPA label specifications. Avitrol exhibits a high persistence in soil and water but, according to literature, does not bioaccumulate (USDA 1997, EXTOXNET 2000). Because of Avitrol's characteristic of binding to soils, it is not expected to be present in surface or ground water as a result of its use on land (EPA 1980). A combination of chemical characteristics and baiting procedures used by WS would reduce the likelihood of environmental accumulation of Avitrol. The EPA has not required studies on the fate of Avitrol in the soil because, based on use patterns, soil residues are expected to be low (EPA 1980).

Based on use patterns, the chemical and physical characteristics of DRC-1339 and Avitrol, and factors related to the environmental fate of those pesticides, no cumulative impacts are expected from the lethal chemical components used or recommended by WS to manage threats and damages associated with birds.

Non-lethal chemicals may also be used or recommended by the WS' program in New Jersey, including nicarbazin. Characteristics of those chemicals and use patterns indicate that no significant cumulative impacts related to environmental fate are expected from their use in reducing threats and damages in the State.

Cumulative Impact Potential from Non-chemical Components

Non-chemical methods used or recommended by the WS program may include exclusion through use of various barriers, minor habitat modification of structures or vegetation, live trapping and euthanasia of wildlife, harassment of wildlife, and shooting.

Some potential exists for cumulative impacts to human health and safety related to the harassment of roosting bird flocks such as blackbirds and European starlings in urban environments. If birds are dispersed from one site and relocate to another where human exposure to concentrations of bird droppings over time occurs, human health and safety could be threatened. If WS is providing direct operational assistance in relocating such birds, coordination with local authorities may be conducted to assure they do not re-establish in other undesirable locations.

XV. SUMMARY OF CUMULATIVE IMPACTS

No significant cumulative environmental impacts are expected from activities considered under the supplement to the EA. Likewise, no significant cumulative impacts have been identified from the implementation of the proposed action in the EA since FY 2003. Under the proposed action, the reduction of wildlife damage or threats using an integrated approach employing both non-lethal and lethal methods would not have significant impacts on wildlife populations in New Jersey or nationwide. WS continues to coordinate activities with federal, state, and local entities to ensure activities do not adversely impact wildlife populations. No risk to public safety is expected when WS' activities are conducted pursuant to the proposed action or the proposed supplement to the EA. The EA further describes and addresses cumulative impacts from the alternatives, including the proposed action.

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