

**DECISION AND
FINDING OF NO SIGNIFICANT IMPACT**

**ENVIRONMENTAL ASSESSMENT: BIRD DAMAGE MANAGEMENT IN THE KENTUCKY
WILDLIFE SERVICES PROGRAM**

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

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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 bird damage to property, agricultural resources, natural resources, and threats to human safety (USDA 2000)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. The EA addressed damage caused by European starlings (*Sturnus vulgaris*), blackbirds² (family Emberizidae, subfamily Icterinae), rock pigeons (*Columba livia*), American crows (*Corvus brachyrhynchos*), woodpeckers (family Picidae), geese (family Anatidae, subfamily Anserinae), ducks (family Anatidae, subfamily Anatinae), American coots (*Fulica americana*), swallows (family Hirundinidae), house sparrows (*Passer domesticus*), raptors (hawks, owls, and vultures; families Falconidae, Accipitridae, Titonidae, Strigidae, and Cathartidae), killdeer (*Charadrius vociferus*), mourning doves (*Zenaida macroura*), double-crested cormorants (*Phalacrocorax auritus*), great blue herons (*Ardea herodias*), and little blue herons (*Egretta caerulea*). The EA also evaluated the limited take of other bird species, primarily to reduce property damage and threats to human safety associated with aircraft strikes at airports. WS' proposed action in the EA implements an integrated damage management program in Kentucky to fully address the need for resolving damage caused by birds while minimizing impacts to the human environment.

The pre-decisional EA³ was made available to the public for review and comment during a 40-day public comment period (October 14, 2000-November 20, 2000) by a legal notice published on October 14, 2000 and October 15, 2000 in the *Louisville Courier Journal*. The pre-decisional EA was also mailed directly to organizations with probable interest in the proposed program and made available for public viewing at three locations in Kentucky. No comments on the pre-decisional EA were received during the public involvement process. After consideration of the analysis contained in the EA, a Decision and Finding of No Significant Impact (FONSI) for the EA was issued on December 7, 2000. The Decision and FONSI selected the proposed action which implemented an integrated approach in Kentucky using multiple methods to adequately address the need to manage damage caused by birds.

¹Copies of the EA and the 2000 Decision/FONSI, the supplement to the EA, and 2003 Decision/FONSI are available for review from the State Director, USDA/APHIS/WS, 537 Myatt Drive, Madison, Tennessee 37115 or by visiting the APHIS website at http://www.aphis.usda.gov/wildlife_damage/nepa.shtml.

²For the purposes of this document, the use of the term 'blackbird' will refer to red-winged blackbirds, tricolored blackbirds, rusty blackbirds, Brewer's blackbirds, yellow-headed blackbirds, brown-headed cowbirds, bronzed cowbirds, great-tailed grackles, and common grackles as described in the EA (USDA 2000) and in WS' programmatic FEIS (USDA 1997).

³After the development of the pre-decisional EA by WS and consulting agencies and after public involvement in identifying new issues and alternatives, WS issues a Decision on the EA. Based on the analyses in the pre-decisional EA after public involvement, a decision is made to either publish a Notice of Intent to prepare an Environmental Impact Statement or to publish a public notice of a Finding of No Significant Impact for the EA in accordance with the NEPA and the Council of Environmental Quality regulations.

II. SUPPLEMENT TO THE EA

After review of program activities conducted under the proposed action, a supplement⁴ to the EA was developed. The supplement to the EA evaluated the issues associated with an increment in the number of requests for assistance received by WS in Kentucky to address damage and threats associated with an increasing number of birds and bird species. The supplement evaluated WS' activities to address an increasing number of requests for assistance to manage damage caused by mourning doves, turkey vultures, black vultures, and purple martins in the State. In addition, the supplement evaluated the take of American robins to reduce threats of aircraft strikes in the State. The supplement to the EA also evaluated the limited take of bird species that were not directly addressed in the EA or the supplement to the EA. The take of bird species not directly addressed in the supplement would be taken in low numbers and would not reach a magnitude where WS' take would adversely affect populations of those species. The pre-decisional supplement was made available for public review and comment during a 36-day period (October 25, 2002 to November 29, 2002) through publication of a legal notice in the *Louisville Courier Journal* on October 25, 2002 and October 26, 2002. The pre-decisional supplement was also mailed to organizations identified as having an interest in bird damage management activities in Kentucky. No comments were received on the pre-decisional supplement during the public involvement process. Based on the analyses in the supplement, a new Decision and FONSI were signed on February 6, 2003.

III. PURPOSE OF THIS DOCUMENT

This new Decision and summary report will analyze WS' bird damage management activities in Kentucky since the 2003 Decision/FONSI was signed for the EA and supplement to: 1) facilitate planning and interagency coordination, 2) streamline program management, 3) ensure WS' activities remain within the scope of analyses contained in the EA and the supplement, and 4) clearly communicate to the public the analysis of individual and cumulative impacts of the proposed action since 2003. This new Decision/FONSI ensures WS' actions comply with NEPA, with the Council on Environmental Quality (40 CFR 1500), and with APHIS' NEPA implementing regulations (7 CFR 372). All damage management activities, including disposal requirements, are conducted consistent with: 1) the Endangered Species Act of 1973, 2) the Migratory Bird Treaty Act (MBTA), 3) the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), 4) Executive Order (EO) 12898⁵, 5) EO 13045⁶, 6) EO 13186⁷, 7) EO 13112⁸, and 8) federal, state, and local laws, regulations, and policies.

IV. ADDITIONAL PUBLIC INVOLVEMENT

This summary report and new Decision along with the EA, the 2000 Decision/FONSI, the supplement to the EA, and the 2003 Decision/FONSI will be made available for public review and comment through a legal notice announcing a minimum of a 30-day comment period. The legal notice will be published in

⁴The supplement to the EA was titled "*Amendment to the Environmental Assessment – Bird damage management in the Kentucky Wildlife Services program*". For the purposes of this document, the use of the term "supplement" will be synonymous to the use of the term "amendment" used in previous documents.

⁵Executive Order 12898 promotes the fair treatment of people of all races, income levels, and cultures with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.

⁶Executive Order 13045 ensures the protection of children from environmental health and safety risks since children may suffer disproportionately from those risks.

⁷Executive Order 13186 directs federal agencies to protect migratory birds and strengthen migratory bird conservation by identifying and implementing strategies that promote conservation and minimize the take of migratory birds through enhanced collaboration.

⁸Executive Order 13112 states that each Federal agency whose actions may affect the status of invasive species shall, to the extent practicable and permitted by law; 1) reduce invasion of exotic species and the associated damages, 2) monitor invasive species populations, provide for restoration of native species and habitats, 3) conduct research on invasive species and develop technologies to prevent introduction, and 4) provide for environmentally sound control, promote public education on invasive species.

The State Journal 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). This new Decision will also be directly mailed to agencies, organizations, and individuals with probable interest in WS' bird damage management activities. Comments received during the public involvement process will be fully considered for new, substantive issues and alternatives. Unless new substantive issues and/or new alternatives are brought to WS' attention, this new Decision will take effect upon the close of the comment period.

V. RELATIONSHIP OF THIS DOCUMENT TO OTHER ENVIRONMENTAL DOCUMENTS

WS' Programmatic Final Environmental Impact Statement: WS has developed a programmatic Final Environmental Impact Statement (FEIS)⁹ 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 and this Decision.

Resident Canada Goose Management Final Environmental Impact Statement: The United States Fish and Wildlife Service (USFWS) has issued a FEIS addressing the need for and potential environmental impacts associated with resident goose damage management activities titled "*Resident Canada Goose Management*" (USFWS 2005)¹⁰. The FEIS also contains detailed analyses of the issues and methods used to manage Canada goose damage. A Record of Decision (ROD) and Final Rule were published by the USFWS on August 10, 2006 (Federal Register Vol. 71, No. 154: 45964- 45993). On June 27, 2007, WS, as a cooperating agency, issued a Record of Decision and adopted the USFWS FEIS (Federal Register Vol. 72, No. 123: 35217).

Double-crested Cormorant Management in the United States Final Environmental Impact Statement: The USFWS has issued a FEIS on the management of double-crested cormorants (USFWS 2003)¹¹. 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 Federal Register 68020). Pertinent and current information available in the FEIS has been incorporated by reference into this document.

VI. AFFECTED ENVIRONMENT

Upon a request for assistance, the proposed action could be conducted on private, federal, state, tribal, and municipal lands in Kentucky to reduce damages and threats associated with birds to agricultural commodities, natural resources, property, and public health and safety. The affected environment includes, but is not necessarily limited to, areas in and around buildings and parks, bridges, industrial sites, urban/suburban woodlots, and airport hangars. Damage management activities may also be conducted at agricultural fields, vineyards, orchards, farmyards, grain mills, and grain handling areas (e.g., railroad yards) where birds destroy crops, feed on spilled grains, or contaminate food products for human or livestock consumption. Additionally, the area of the proposed action would include airports and surrounding property where birds represent a threat to aviation safety.

⁹Copies of WS' programmatic FEIS are available from USDA/APHIS/WS-Operational Support Staff, 4700 River Road, Unit 87, Riverdale, MD 20737-1234.

¹⁰The FEIS may be obtained by contacting the Division of Migratory Bird Management, U.S. 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/issues/cangeese/finaleis.htm>.

¹¹The FEIS may be obtained by contacting the Division of Migratory Bird Management, U.S. Fish and Wildlife Service, 4401 North Fairfax Drive, MBSP-4107, Arlington, Virginia 22203 or by downloading it from the USFWS website at <http://migratorybirds.fws.gov/issues/cormorant/cormorant.html>. WS' ROD may be viewed at http://www.aphis.usda.gov/wildlife_damage/nepa.shtml.

WS has reviewed the affected environment during evaluations of programs activities under the proposed action through annual monitoring reports and this summary report. The affected environment has not changed since the implementation of the proposed action and continues to be as addressed in the EA.

VII. MONITORING

The WS program in Kentucky annually reviews program activities to determine impacts on issues identified in the EA and other environmental documents (see Section V above) to ensure that program activities are within the scope of analysis contained in the EA. The annual monitoring reports document WS' activities while discussing any new information that becomes available since the completion of the EA and the last monitoring report. If WS' activities, as identified in the annual monitoring reports, are outside the scope of the analyses in the EA or if new issues are identified from available information, further analysis would occur and the EA would be supplemented to the degree as identified by those processes pursuant to NEPA or a notice of intent to prepare an Environmental Impact Statement (EIS) would occur.

This summary report and new Decision will evaluate WS' activities to resolve and prevent damage caused by birds in the State under the proposed action described in the EA since the 2003 Decision and FONSI were signed. WS will continue to coordinate activities to alleviate or prevent bird damage with the USFWS and the Kentucky Department of Fish and Wildlife Resources (KDFWR) to ensure WS' activities are considered as part of the management objectives for birds in the State. This new Decision ensures WS' actions comply with NEPA, with the Council on Environmental Quality (40 CFR 1500), and with APHIS' NEPA implementing regulations (7 CFR 372).

VIII. WS' ACTIVITIES TO MANAGE DAMAGE CAUSED BY BIRDS IN KENTUCKY

WS continued to provide both technical assistance and direct management activities to cooperators requesting assistance with damage caused by birds in Kentucky from the federal fiscal year (FY)¹² 2003 through FY 2008. Technical assistance provides those interested with information and recommendations on preventing wildlife damage and effective methods for resolving damage which are legally available for use. This information can then be employed by those persons experiencing wildlife damage to effectively resolve damage without WS' direct involvement.

Operational assistance occurs when WS is directly involved with employing methods to resolve, alleviate, or reduce threats associated with wildlife. As directed by the selected alternative, WS applies multiple methods as part of an integrated damage management program to resolve requests for assistance using the WS Decision Model (Slate et al. 1992, USDA 1997, USDA 2000). WS' technical assistance and direct operational programs are discussed in detail in the EA (USDA 2000) along with WS' programmatic FEIS (USDA 1997). WS' bird damage management activities conducted in Kentucky from FY 2003 through FY 2008 as addressed in the EA are summarized below by year.

WS' Bird Damage Management Activities in Kentucky 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 159 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 1). Requests for assistance involved damage and threats to a variety of resources and often involved multiple resources (e.g., geese can cause damage to property and pose a risk to human safety). WS conducted 28

¹²The federal fiscal year begins on October 1 and ends on September 30 the following year.

technical assistance projects involving European starlings in FY 2003 which was the highest of any bird species followed by 25 technical assistance projects involving Canada geese. WS provided technical assistance to those requesting assistance involving at least 26 species of birds in Kentucky in FY 2003. Requests for assistance associated with starlings arose primarily from concerns with disease risks and damage to property associated with accumulation of droppings that occur under starling roosting and loafing sites. Requests for assistance associated with Canada geese arose primarily from damage to property from feeding and threats to human safety associated 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 starlings and geese, WS conducted 20 technical assistance projects involving pigeons in the State. Over 37% of the requests for technical assistance involved damage or threats posed by non-native species in Kentucky. 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.

As shown in Table 2, 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 2000). A total of 671,656 birds were addressed using non-lethal methods in FY 2003. Over 98% of the birds dispersed were European starlings and blackbirds. Of those birds addressed in FY 2003, over 95% were dispersed using non-lethal harassing techniques.

Table 1 – The number of technical assistance projects by species conducted by WS during FY 2003.

Species	Projects	Species	Projects
Double Crested Cormorant	2	Pileated Woodpecker	1
Great Blue Heron	4	Woodpecker, other	8
Black Crowned Night Heron	8	Blue Jay	1
Turkey Vulture	1	American Crow	1
Vultures (mixed)	5	Purple Martin	1
Canada Goose	25	Northern Mockingbird	4
Mallards	12	European Starling	28
Red-tailed Hawks	14	Common Grackle	1
Rock Pigeon	20	Blackbirds (mixed)	7
Great Horned Owl	2	House Sparrow	6
Barred Owl	1	Passerines, other*	2
Common Nighthawk	1	Feral Geese	1
Downy Woodpecker	1	Feral Duck	2
		Total	159

*WS information management system in FY 2003 did not have a species entry for recording all bird species addressed but allowed for birds to be grouped by guild or common characteristics. WS' take was reported to the USFWS by species.

WS received requests for assistance to alleviate damage and reduce threats associated with at least 32 species of birds in Kentucky during FY 2003. WS addressed 7,255 mourning doves in FY 2003 at airports where the flocking behavior of doves during their spring and fall migrations can pose increased strike risks to aircraft at airports. Nearly 84% of the mourning doves addressed were non-lethally dispersed from airports using pyrotechnics and other noise-producing methods. WS also addressed 4,017 vultures in Kentucky at the request of cooperators during FY 2003. The large body size and soaring behavior of vultures can pose risks to aircraft when vultures are present near airports. Vultures also cause damage to property and agricultural resources in Kentucky. Over 95% of the vultures addressed in Kentucky 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 3, WS employed those methods described in the EA to lethally take 34,976 birds in FY 2003. Over 90% of those birds lethally taken were European starlings and rock pigeons both non-native species in North America. A total of 27,830 European starlings were lethally removed in Kentucky during FY 2003 using primarily the avicide DRC-1339. The number of starlings lethally taken by WS using DRC-1339 was estimated based on bait consumption. WS employed shooting, live-trapping followed by euthanasia, and the avicide DRC-1339 to take a total of 3,861 pigeons in Kentucky during FY 2003. Pigeons were euthanized using carbon dioxide or cervical dislocation which are euthanasia methods that are approved by the American Veterinary Medical Association (AVMA) for birds (AVMA 2007).

Table 2 – Number of birds dispersed and taken in Kentucky by WS during FY 2003.

Species	Dispersed	Take	Species	Dispersed	Take
Great Blue Heron	17	13	Wild Turkey	130	5
Great Egret	0	1	Killdeer	477	150
Black-crowned Night Heron	91	7	Ring-billed Gull	1,012	32
Black Vulture	401	60	Rock Pigeon	174	3,861
Turkey Vulture	1,019	94	Mourning Dove	6,062	1,193
Vultures (mixed)	2,420	23	Great Horned Owl	0	7
Canada Goose	952	101	American Crow	518	6
Wood Duck	1	1	Horned Lark	0	1
Mallard	592	206	Barn Swallow	0	12
Blue-winged Teal	8	1	American Robin	250	71
Greater Scaup	0	2	European Starling	345,684	27,830
Dabbling Duck*	1	6	Red-winged Blackbird	136	78
Kites – Other*	0	4	Eastern Meadowlark	0	45
Red-shouldered Hawk	0	3	Common Grackle	100	30
Red-tailed Hawk	15	63	Blackbirds (mixed)	311,269	952
Hawk – Other*	0	2	House Sparrow	310	96
American Kestrel	17	19	Feral Ducks	0	1
			TOTAL	671,656	34,976

*WS information management system in FY 2003 did not have a species entry for recording all bird species addressed but allowed for birds to be grouped by guild or common characteristics. WS' take was reported to the USFWS by species.

WS also used DRC-1339 to lethally take 922 blackbirds and 603 rock pigeons in FY 2003. Requests for use of lethal methods to address pigeon and 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 are stored or mixed. Large groups of starlings and pigeons can also pose strike hazards to aircraft when nesting, roosting, and loafing occurs near airports. The immobilizing chemical alpha-chloralose was also used by WS to live-capture nine mallards during FY 2003. Live-captured mallards were subsequently euthanized using carbon dioxide. WS also addressed damage and threats associated with a nesting colony of black-crowned night herons in a residential area of Kentucky during FY 2003. The nesting colony was killing vegetation under the roosting colony from an accumulation of dropping. The odor from the accumulations of droppings and the smell of rotting fish was aesthetically displeasing to property owners. To address those damages, WS lethally removed seven herons and destroyed 40 eggs/nests at the colony to discourage the herons from nesting at the location in subsequent years.

Table 3 – WS' Take of bird species in Kentucky by method during FY 2003

SPECIES	METHOD						TOTAL
	Firearm	Trap	AC	DRC-1339	Avitrol	Other ^a	
Great Blue Heron	13	0	0	0	0	0	13
Great Egret	1	0	0	0	0	0	1
Black-crowned Night Heron	7	0	0	0	0	0	7
Black Vulture	35	25	0	0	0	0	60
Turkey Vulture	93	1	0	0	0	0	94
Vultures (mixed)	21	2	0	0	0	0	23
Canada Goose	69	26	6	0	0	0	101
Wood Duck	1	0	0	0	0	0	1
Mallard	197	0	9	0	0	0	206
Blue-winged Teal	1	0	0	0	0	0	1
Greater Scaup	2	0	0	0	0	0	2
Dabbling Duck*	6	0	0	0	0	0	6
Kites – Other*	4	0	0	0	0	0	4
Red-shouldered Hawk	3	0	0	0	0	0	3
Red-tailed Hawk	37	26	0	0	0	0	63
Hawk – Other*	2	0	0	0	0	0	2
American Kestrel	15	4	0	0	0	0	19
Wild Turkey	5	0	0	0	0	0	5
Killdeer	150	0	0	0	0	0	150
Ring-billed Gull	32	0	0	0	0	0	32
Rock Pigeon	1,570	1,687	0	603	1	0	3,861
Mourning Dove	1,170	23	0	0	0	0	1,193
Great Horned Owl	0	7	0	0	0	0	7
American Crow	6	0	0	0	0	0	6
Horned Lark	1	0	0	0	0	0	1
Barn Swallow	12	0	0	0	0	0	12
American Robin	71	0	0	0	0	0	71
European Starling	3,451	1	0	24,338	26	14	27,830
Red-winged Blackbird	78	0	0	0	0	0	78
Eastern Meadowlark	45	0	0	0	0	0	45
Common Grackle	9	0	0	0	20	1	30
Blackbirds (mixed)	30	0	0	922	0	0	952
House Sparrow	19	0	0	0	77	0	96
Feral Duck	1	0	0	0	0	0	1

^aOther methods could include non-chemical methods such as hand-capture, rocket net, and/or cannon net. All methods employed were discussed in Appendix B of the EA.

*WS information management system in FY 2003 did not have a species entry for recording all bird species addressed but allowed for birds to be grouped by guild or common characteristics. WS' take was reported to the USFWS by species.

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 Kentucky to identify attractants to birds on airport properties and to reduce threats of aircraft being struck by birds. All take by WS in Kentucky 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 706,632 birds in FY 2003 that were identified as posing threats to agricultural resources, natural resources, property, and posing threats to human safety in Kentucky using an integrated approach addressed in the proposed action. Over 95% of those birds addressed were non-lethally harassed and dispersed from areas where damages or threats were occurring.

WS' Bird Damage Management Activities in Kentucky during FY 2004

WS continued to provide technical assistance and direct operational damage management to those 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 4 provides the number of technical assistance projects conducted in Kentucky by WS. As shown in Table 4, WS conducted 216 technical assistance projects in FY 2004 involving damage to agricultural resources, natural resources, property, and threats to human safety. Over 62% of the technical assistance projects conducted by WS in FY 2004 involved bird damage to property, primarily caused by Canada geese, European starlings, and rock pigeons. WS received 55 requests for technical assistance involving Canada geese in FY 2004 which was the highest of all bird species.

WS provided technical assistance on resolving and preventing damage involving at least 25 species of birds in FY 2004. Over 68% of the requests for technical assistance involved damage or threats associated with Canada geese, European starlings, vultures, and rock pigeons. Many of the requests for assistance involved damage to multiple resources. For example, starlings can pose a threat to property from damage occurring from an aircraft strike which can also threaten human safety. Over 36% of the requests for assistance involved damage or threats associated with non-native bird species during FY 2004.

Table 4 – Technical assistance projects conducted by WS during FY 2004 by species and resource

Species	Resource ^a				Total	Species	Resource				Total
	A	N	P	H			A	N	P	H	
Great Blue Heron	6	0	1	0	7	Rock Pigeon	0	0	16	5	21
Great Egret	1	0	0	0	1	Mourning Dove	1	0	0	1	2
Black-crowned Night Heron	0	0	4	1	5	Downy Woodpecker	0	0	1	0	1
Black Vulture	1	0	0	0	1	Pileated Woodpecker	0	0	1	0	1
Turkey Vulture	1	0	1	0	2	Woodpecker (other)*	0	0	5	0	5
Vultures (mixed)	8	0	14	0	22	Purple Martin	0	0	2	0	2
Canada Goose	3	0	39	13	55	Swallows*	0	0	1	0	1
Mallard	0	0	9	1	10	Northern Mockingbird	0	0	0	2	2
Red-tailed Hawk	4	0	5	3	12	European Starling	1	0	24	21	46
Hawks (other)*	0	1	0	0	1	Blackbirds (mixed)	0	0	1	3	4
Gulls (other)*	0	0	0	1	1	House Sparrow	0	0	3	1	4
Eastern Screech Owl	0	0	0	1	1	Feral Ducks	0	0	5	0	5
Great Horned Owl	2	0	0	0	2	Feral Geese	0	0	2	0	2
						TOTAL	25	1	134	53	216

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

*WS information management system in FY 2003 did not have a species entry for recording all bird species addressed but allowed for birds to be grouped by guild or common characteristics. WS' take was reported to the USFWS by species.

Bird species addressed in Kentucky by WS during direct operational assistance are shown in Table 5. WS addressed at least 36 species of birds during operational assistance in Kentucky during FY 2004. Mixed species flocks of blackbirds and European starlings were the two bird groups most often addressed in FY 2004. 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 2000). 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 1,241,388 birds were addressed using non-lethal methods to alleviate damage or reduce threats in FY 2004. At least 29 species of birds were non-lethally harassed or dispersed in Kentucky in FY 2004. Of the total number of birds addressed in FY 2004, nearly 99% were non-lethally dispersed or harassed to alleviate damage or to reduce threats in the State. WS used non-lethal methods to address over 900,000 blackbirds in FY 2004 and over 285,000 starlings.

Table 5 – Number of birds dispersed and taken in Kentucky by WS during FY 2004

Species	Dispersed	Take	Species	Dispersed	Take
Horned Grebe	1	2	Killdeer	130	153
Great Blue Heron	89	34	Ring-billed Gull	743	30
Great Egret	24	9	Gulls (other)*	1	0
Green Heron	13	5	Rock Pigeon	368	2,427
Black-crowned Night Heron	0	13	Mourning Dove	23,934	2,221
Black Vulture	562	24	Barn Owl	0	30
Turkey Vulture	1,498	62	Great Horned Owl	1	11
Vultures (mixed)	2,459	104	American Crow	389	14
Canada Goose	609	559	Purple Martin	18,050	0
Mallard	515	156	Barn Swallow	100	45
Blue-winged Teal	12	5	American Robin	2,410	88
Diving Duck	14	8	European Starling	285,252	9,624
Cooper's Hawk	0	1	Red-winged Blackbird	100	89
Red-tailed Hawk	109	236	Eastern Meadowlark	200	41
Red-shouldered Hawk	0	4	Common Grackle	170	3
American Kestrel	96	92	Brown-headed Cowbird	0	317
Hawks (other)*	0	1	Blackbirds (mixed)	900,560	556
Wild Turkey	29	6	House Sparrow	0	33
American Coot	2,950	1	Feral Ducks	0	26
			TOTAL	1,241,388	17,030

*WS information management system in FY 2004 did not have a species entry for recording all bird species addressed but allowed for birds to be grouped by guild or common characteristics. WS' take was reported to the USFWS by species.

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 6). European starlings, rock pigeons, and mourning doves were the three species with the highest take levels in FY 2004. Those three species comprised nearly 84% of the lethal take of birds in Kentucky during FY 2004. Of the starlings addressed, nearly 97% were non-lethally harassed using auditory dispersal techniques. Pigeons and starlings are considered an invasive species in the United States that compete with native species for nesting sites and food resources. Pigeons and starlings are gregarious species that increase hazards to aircraft at airports and pose threats of disease transmission where fecal matter accumulates under roosts. Pigeons and starlings are afforded no protection under the MBTA.

Table 6 – WS' Take of bird species in Kentucky by method during FY 2004

SPECIES	METHOD						TOTAL
	Firearm	Trap	AC	DRC-1339	Avitrol	Other ^a	
Horned Grebe	2	0	0	0	0	0	2
Great Blue Heron	34	0	0	0	0	0	34
Great Egret	9	0	0	0	0	0	9
Green Heron	5	0	0	0	0	0	5
Black-crowned Night Heron	13	0	0	0	0	0	13
Black Vulture	24	0	0	0	0	0	24
Turkey Vulture	62	0	0	0	0	0	62
Vultures (mixed)	104	0	0	0	0	0	104
Canada Goose	57	453	49	0	0	0	559
Mallard	142	14	0	0	0	0	156
Blue-winged Teal	5	0	0	0	0	0	5
Diving Duck	8	0	0	0	0	0	8
Cooper's Hawk	1	0	0	0	0	0	1
Red-tailed Hawk	169	67	0	0	0	0	236
Red-shouldered Hawk	2	2	0	0	0	0	4
American Kestrel	78	0	0	0	0	14	92
Hawk (other)*	1	0	0	0	0	0	1
Wild Turkey	6	0	0	0	0	0	6
American Coot	1	0	0	0	0	0	1
Killdeer	153	0	0	0	0	0	153
Ring-billed Gull	30	0	0	0	0	0	30
Rock Pigeon	757	1,429	0	236	3	2	2,427
Mourning Dove	2,209	12	0	0	0	0	2,221
Barn Owl	30	0	0	0	0	0	30
Great Horned Owl	3	8	0	0	0	0	11
American Crow	14	0	0	0	0	0	14
Barn Swallow	45	0	0	0	0	0	45
American Robin	88	0	0	0	0	0	88
European Starling	5,909	0	0	3,675	0	40	9,624
Red-winged Blackbird	89	0	0	0	0	0	89
Eastern Meadowlark	41	0	0	0	0	0	41
Common Grackle	2	0	0	0	1	0	3
Brown-headed Cowbird	315	0	0	2	0	0	317
Blackbirds (mixed)	376	0	0	180	0	0	556
House Sparrow	0	0	0	0	33	0	33
Feral Ducks	0	17	9	0	0	0	26

^aOther methods could include non-chemical methods such as hand-capture, rocket net, and/or cannon net. All methods employed were discussed in Appendix B of the EA.

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

All take of native bird species was conducted under a depredation permit issued by the USFWS or a depredation order pursuant to the MBTA. Similar to starlings, nearly 92% of the mourning doves addressed were dispersed using non-lethal methods. The number of morning doves addressed in FY 2004 increased over 260% compared to the number of doves addressed in FY 2003. WS addressed 18,050 purple martins in FY 2004 while no martins were addressed in FY 2003. The martins addressed in FY 2004 were non-lethally harassed from areas near airports in Kentucky to reduce the threats to property and human safety from aircraft strikes.

WS also employed chemical methods during FY 2004 to resolve damage in Kentucky when requested by a cooperator. Alpha-chloralose was used to immobilize and live-capture 49 Canada geese in FY 2004 which were subsequently euthanized by carbon dioxide or cervical dislocation at the request of the cooperator. WS also used the avicide DRC-1339 to take blackbirds, pigeons, and starlings in FY 2004. The use of DRC-1339 by WS in FY 2004 resulted in the lethal take of 180 blackbirds, two cowbirds, 236 pigeons, and 3,675 starlings. Nearly 38% of the total take of starlings in FY 2004 occurred from the use of DRC-1339. Avitrol was also used by WS in FY 2004 to take one common grackle, three pigeons, and 33 house sparrows in Kentucky. Appendix B in the EA (USDA 2000) contains a detailed description of the methods available for use to resolve bird damage in Kentucky, including the chemical methods employed in FY 2004 by WS.

WS' Bird Damage Management Activities in Kentucky during FY 2005

WS' activities continued in FY 2005 with the use of an integrated approach to managing bird damage and threats. WS provided 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 7). 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 \$1.5 million in damage associated with birds in Kentucky during FY 2005.

Table 7 – 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	Mourning Dove	0	0	3	3	6
Great Blue Heron	8	2	0	0	10	Owls (other)	0	0	3	0	3
Great Egret	1	0	0	0	1	Red-headed Woodpecker	0	0	2	0	2
Green Heron	1	0	0	0	1	Downy Woodpecker	0	0	5	0	5
Black-crowned Night Heron	0	0	8	1	9	American Crow	0	0	1	0	1
Black Vulture	1	0	5	0	6	Purple Martin	0	0	2	0	2
Turkey Vulture	1	0	3	0	4	Barn Swallow	0	0	1	0	1
Vultures (mixed)	3	0	7	3	13	American Robin	0	0	3	2	5
Canada Goose	10	2	45	23	80	Northern Mockingbird	0	0	0	2	2
Mallard	0	0	19	3	22	European Starling	2	0	32	33	67
Cooper's Hawk	1	0	0	1	2	Blackbirds (mixed)	5	0	26	32	63
Red-tailed Hawk	5	4	22	5	36	House Finch	0	0	1	0	1
Sharp-shinned Hawk	1	0	0	0	1	House Sparrow	0	0	7	7	14
American Kestrel	0	0	0	1	1	Pea Fowl	1	0	0	0	1
Hawk (other)	0	0	2	3	5	Feral Ducks	0	0	33	0	33
Ring-billed Gull	1	0	0	0	1	Feral Geese	0	0	3	0	3
Rock Pigeon	0	0	20	12	32	TOTAL	41	10	253	131	435

^aA=agricultural resources, N=Natural Resources, P=Property, H=Human Safety

*WS information management system in FY 2005 did not have a species entry for recording all bird species addressed but allowed for birds to be grouped by guild or common characteristics. WS' take was reported to the USFWS by species.

WS conducted 435 technical assistance projects involving birds in Kentucky during FY 2005. A total of 80 projects were conducted by WS that involved providing information on resolving damage caused by Canada geese, primarily damage to property and threats to human safety. In addition, WS conducted 67 technical assistance projects involving European starlings and 63 projects providing information on reducing damage caused by blackbirds. Over 88% of the technical assistance projects conducted by WS

involved damage to property and threats to human safety. WS conducted 41 projects involving damage to agricultural resources caused primarily by great blue herons and Canada geese. In addition, ten technical assistance projects were conducted to alleviate damage or threats to natural resources associated with cormorants, great blue herons, geese, and red-tailed hawks. Over 34% of the technical assistance projects conducted by WS in FY 2005 involved non-native species.

Table 8 provides the number of birds dispersed and taken by WS during FY 2005 as part of direct operational management activities. As part of an integrated damage management approach, WS employed both lethal and non-lethal methods to resolve damage and reduce threats. A total of 646,352 birds were dispersed using non-lethal methods in FY 2005. Similar to FY 2004, blackbirds and European starlings were the two species of birds most often addressed in the State. A total of 265,324 blackbirds (mixed species) and 338,803 starlings were dispersed by WS using non-lethal methods which comprised nearly 94% of the birds harassed in the State. The number of birds harassed and dispersed in the State during FY 2005 decreased 48% when compared to the number of birds addressed in FY 2004 but was similar to the number of birds addressed using non-lethal methods in FY 2003. The number of mixed species flocks of blackbirds addressed in FY 2005 using non-lethal decreased nearly 71% compared to the number of blackbirds addressed using non-lethal methods in FY 2004. Nearly 98% of the birds addressed in the State during FY 2005 were non-lethally harassed and dispersed.

Table 8 – Number of birds dispersed and taken in Kentucky by WS during FY 2005

Species	Dispersed	Take	Species	Dispersed	Take
Double-crested Cormorant	400	10	Killdeer	122	100
Horned Grebe	1	0	Ring-billed Gull	701	28
Great Blue Heron	38	9	Rock Pigeon	194	1,698
Great Egret	13	0	Mourning Dove	10,189	598
Green-backed Heron	2	0	American Crow	4,738	59
Black Vulture	1,436	120	American Robin	40	2
Turkey Vulture	2,130	118	European Starling	338,803	9,350
Vultures (mixed)	3,579	0	Northern Cardinal	0	1
Canada Goose	1,636	101	Red-winged Blackbird	597	157
Wood Duck	8	0	Eastern Meadowlark	0	2
Mallard	758	103	Common Grackle	47	3
Blue-winged Teal	8	0	Brown-headed Cowbird	13,258	627
Dabbling Duck	0	1	Blackbirds (mixed)	265,324	1,533
Cooper's Hawk	1	2	Blackbird (other)	2,000	3
Red-tailed Hawk	203	73	House Sparrow	10	26
Red-shouldered Hawk	0	1	Feral Duck	0	1
American Kestrel	31	29	Feral Goose	16	4
Wild Turkey	69	4	TOTAL	646,352	14,763

*WS information management system in FY 2005 did not have a species entry for recording all bird species addressed but allowed for birds to be grouped by guild or common characteristics. WS' take was reported to the USFWS by species.

No purple martins were addressed in FY 2005 compared to over 18,000 addressed in FY 2004. The number of morning doves addressed at airports in FY 2005 decreased over 58% compared to the number addressed in FY 2004. The number of vultures addressed in Kentucky however increased by over 58% in FY 2005. The number of crows addressed in urban roosts increased from 403 crows addressed in FY 2004 to nearly 4,800 crows addressed in FY 2005. The number of cowbirds addressed in FY 2005 also increased from 317 addressed in FY 2004 to nearly 14,000 addressed in FY 2005.

WS also employed lethal methods to reinforce non-lethal methods in FY 2005 in an integrated approach to resolving requests for assistance. A total of 14,763 birds were lethally removed in the State during FY 2005 compared to 17,059 removed in FY 2004. WS employed firearms, traps, DRC-1339, and Avitrol to take 9,350 starlings in FY 2005 which was the highest number of birds taken for any species. Starlings were primarily taken with firearms and DRC-1339 (see Table 9). WS also used firearms, traps, and DRC-1339 to take 1,698 pigeons in FY 2005. Of those pigeons taken, 61% were taken using walk-in traps where pigeons are live-captured and euthanized by cervical dislocation or carbon dioxide. Chemical methods described in the EA were also employed by WS in FY 2005. DRC-1339 was used to take 78 blackbirds, including American crows, 146 rock pigeons, and 5,373 starlings to alleviate damage. To capture waterfowl, WS used alpha-chloralose to live-capture and euthanize one feral duck, four feral geese, 55 Canada geese, and 21 mallards in FY 2005. Avitrol was also used by WS in FY 2005 that resulted in the take of five house sparrows and ten starlings.

Table 9 – WS’ Take of bird species in Kentucky by method during FY 2005

SPECIES	METHOD						TOTAL
	Firearm	Trap	AC	DRC-1339	Avitrol	Other ^a	
Double-crested Cormorant	10	0	0	0	0	0	10
Great Blue Heron	9	0	0	0	0	0	9
Black Vulture	120	0	0	0	0	0	120
Turkey Vulture	118	0	0	0	0	0	118
Canada Goose	42	0	55	0	0	4	101
Mallard	82	0	21	0	0	0	103
Dabbling Duck	1	0	0	0	0	0	1
Cooper’s Hawk	0	2	0	0	0	0	2
Red-tailed Hawk	61	11	0	0	0	1	73
Red-shouldered Hawk	0	1	0	0	0	0	1
American Kestrel	24	5	0	0	0	0	29
Wild Turkey	4	0	0	0	0	0	4
Killdeer	100	0	0	0	0	0	100
Ring-billed Gull	28	0	0	0	0	0	28
Rock Pigeon	514	1,036	0	146	0	2	1,698
Mourning Dove	598	0	0	0	0	0	598
American Crow	34	0	0	25	0	0	59
American Robin	2	0	0	0	0	0	2
European Starling	3,964	3	0	5,373	10	0	9,350
Northern Cardinal	1	0	0	0	0	0	1
Red-winged Blackbird	157	0	0	0	0	0	157
Eastern Meadowlark	2	0	0	0	0	0	2
Common Grackle	3	0	0	0	0	0	3
Brown-headed Cowbird	627	0	0	0	0	0	627
Blackbirds (mixed)	1,483	0	0	50	0	0	1,533
Blackbirds (other)	0	0	0	3	0	0	3
House Sparrow	21	0	0	0	5	0	26
Feral Duck	0	0	1	0	0	0	1
Feral Goose	0	0	4	0	0	0	4

^aOther methods could include non-chemical methods such as hand-capture, rocket net, and/or cannon net.

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

Birds were primarily lethally taken in FY 2005 to reduce threats of birds being struck by aircraft which can cause damage to aircraft and threaten human safety. However, requests were also received in FY

2005 to resolve damage and threats occurring to agricultural resources, to property, and to natural resources in Kentucky as well as threats to human safety. Over 75% of the birds lethally taken are non-native to North America. Non-native bird species often compete with native wildlife for nesting and food resources. Many of the non-native bird species are closely associated with human activities and exhibit flocking behavior. Large flocks of birds can cause damage to property and pose risks to human safety when large concentrations of fecal matter accumulates under areas where birds roost, loaf, and/or nest. Fecal matter, if not cleaned daily, can be aesthetically displeasing, can often smell, and when accumulations occur in areas with human activity can pose a threat to human safety. All take occurred in FY 2005 pursuant to a depredation permit issued by the USFWS in accordance with the MBTA or under depredation orders.

WS' Bird Damage Management Activities in Kentucky 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 42 species of birds in FY 2006 which is an increase compared to the 31 species of birds that WS conducted technical assistance projects for in FY 2005 (see Table 10).

Table 10 – 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	2	2	0	0	4	Owls (other)*	0	0	1	0	1
Great Blue Heron	4	3	3	0	10	Common Nighthawk	0	0	1	0	1
Great Egret	1	0	0	0	1	Swift*	0	0	1	0	1
Green Heron	1	0	0	0	1	Red-headed woodpecker	0	0	2	0	2
Black-crowned Night Heron	0	0	4	0	4	Downy Woodpecker	0	0	2	0	2
Black Vulture	18	0	8	2	28	Pileated Woodpecker	0	0	1	0	1
Turkey Vulture	1	0	15	0	16	Woodpecker (other)	0	0	2	0	2
Vultures (mixed)	1	0	9	3	13	Blue Jay	0	0	1	0	1
Canada Goose	2	1	54	21	78	American Crow	0	0	1	0	1
Mute Swan	0	0	1	0	1	American Robin	2	0	2	0	4
Mallard	0	0	18	6	24	Northern Mockingbird	0	3	4	0	7
Sharp-shinned Hawk	1	0	0	0	1	European Starling	8	0	13	16	37
Cooper's Hawk	1	0	0	0	1	Northern Cardinal	0	0	2	0	2
Red-tailed Hawk	7	3	15	3	28	Red-winged Blackbird	0	0	2	0	2
American Kestrel	0	0	1	0	1	Blackbirds (mixed)	2	0	14	23	39
Peregrine Falcon	0	0	1	0	1	Blackbird (other)*	0	0	3	0	3
Hawk (other)*	1	3	2	0	6	House Sparrow	0	0	3	2	5
Wild Turkey	0	0	1	2	3	Eurasian Tree Sparrow	0	0	1	0	1
Ring-billed Gull	0	1	1	0	2	Unknown Bird	0	0	1	1	2
Rock Pigeon	0	0	18	7	25	Pea Fowl	0	0	1	0	1
Mourning Dove	1	0	1	0	2	Feral Ducks	0	0	13	2	15
Great Horned Owl	0	0	2	1	3	Feral Geese	0	0	1	1	2
						TOTAL	53	16	226	90	385

^aA=agricultural resources, N=Natural Resources, P=Property, H=Human Safety

*WS information management system in FY 2006 did not have a species entry for recording all bird species addressed but allowed for birds to be grouped by guild or common characteristics.

WS conducted a total of 385 technical assistance projects in FY 2006. WS conducted 78 technical assistance projects involving Canada geese which were the highest of any bird species. WS conducted 57 technical assistance projects involving vultures in FY 2006 in Kentucky compared to 23 technical assistance projects conducted for vultures in FY 2005. WS verified or cooperators reported bird damage to property, agricultural resources, and natural resources totaling \$2,203,275 in FY 2006. Damages occurred primarily to property during FY 2006.

WS continue to provide direct operational assistance in Kentucky during FY 2006 to those requesting assistance with reducing or preventing damage caused by at least 31 species of birds (see Table 11). 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 in FY 2006. As part of the integrated approach to managing damage and threats, WS used non-lethal harassment techniques to disperse 1,471,953 birds in the State. At least 25 species of birds were addressed using non-lethal methods during FY 2006. Over 96% of the birds addressed in Kentucky during FY 2006 using non-lethal dispersal methods were blackbirds and starlings. WS also captured and relocated 440 Canada geese in FY 2006 using walk-in traps, alpha-chloralose, and hand capture. Geese were relocated to areas identified as having suitable habitat in Kentucky.

Table 11 – Number of birds dispersed and taken in Kentucky by WS during FY 2006

Species	Dispersed	Take	Species	Dispersed	Take
Double-crested Cormorant	660	60	Rock Pigeon	194	1,475
Great Blue Heron	12	9	Mourning Dove	10,821	1,042
Cattle Egret	2	1	Common Nighthawk	1	0
Green Heron	0	8	American Crow	1,100	12
Black Vulture	1,509	60	Barn Swallow	0	3
Turkey Vulture	1,403	122	American Robin	1,150	165
Vultures (mixed)	1,607	0	European Starling	538,315	6,130
Canada Goose	1,271	92	Northern Cardinal	0	1
Mallard	141	63	Red-winged Blackbird	640	57
Northern Harrier	2	0	Eastern Meadowlark	0	3
Cooper's Hawk	1	0	Common Grackle	700	1
Red-tailed Hawk	136	41	Brown-headed Cowbird	31,975	1,850
American Kestrel	70	39	Blackbirds (mixed)	879,973	1,217
Killdeer	45	47	House Sparrow	0	18
Semipalmated Plover	4	0	Feral Chickens	0	2
Least Sandpiper	29	0	Feral Duck	0	1
Ring-billed Gull	192	2	TOTAL	1,471,953	12,521

WS continued to employ lethal methods that resulted in the take of 12,521 birds in Kentucky during FY 2006. Nearly 74% of those birds lethally taken were blackbirds and starlings in FY 2006. Of the 916,824 blackbirds addressed in FY 2006, over 99% were non-lethally dispersed using non-lethal methods. Nearly 99% of the starlings addressed in FY 2006 were non-lethally harassed using pyrotechnics and other noise producing methods. To reduce threats of aircraft strikes, WS employed lethal methods to take 1,042 morning doves in FY 2006. However, over 91% of the doves addressed by WS were non-lethally harassed and dispersed from airports in Kentucky to reduce threats of aircraft strikes. Over 99% of the birds addressed by WS during FY 2006 were non-lethally harassed to resolve damage and reduce threats in Kentucky.

As shown in Table 12, WS' lethal take of birds occurred primarily from the use of firearms in FY 2006 to alleviate damages and threats. A total of 825 pigeons were live-captured in walk-in traps and

subsequently euthanized by carbon dioxide or cervical dislocation. Alpha-chloralose was also used to live-capture 13 Canada geese in FY 2006. Geese live-captured by alpha-chloralose were subsequently euthanized by carbon dioxide. The avicide DRC-1339 was used to take 82 rock pigeons and 1,698 starlings to alleviate damage and threats in Kentucky. Avitrol was also used by WS to take 92 starlings in FY 2006.

Table 12 – WS' Take of bird species in Kentucky by method during FY 2006

SPECIES	METHOD						TOTAL
	Firearm	Trap	AC	DRC-1339	Avitrol	Other	
Double-crested Cormorant	60	0	0	0	0	0	60
Great Blue Heron	9	0	0	0	0	0	9
Cattle Egret	1	0	0	0	0	0	1
Green Heron	8	0	0	0	0	0	8
Black Vulture	60	0	0	0	0	0	60
Turkey Vulture	122	0	0	0	0	0	122
Canada Goose	78	0	13	0	0	1	92
Mallard	63	0	0	0	0	0	63
Red-tailed Hawk	38	2	0	0	0	1	41
American Kestrel	39	0	0	0	0	0	39
Killdeer	47	0	0	0	0	0	47
Ring-billed Gull	2	0	0	0	0	0	2
Rock Pigeon	568	825	0	82	0	0	1,475
Mourning Dove	1,042	0	0	0	0	0	1,042
American Crow	12	0	0	0	0	0	12
Barn Swallow	3	0	0	0	0	0	3
American Robin	165	0	0	0	0	0	165
European Starling	4,285	5	0	1,698	92	50	6,130
Northern Cardinal	1	0	0	0	0	0	1
Red-winged Blackbird	57	0	0	0	0	0	57
Eastern Meadowlark	3	0	0	0	0	0	3
Common Grackle	1	0	0	0	0	0	1
Brown-headed Cowbird	1,850	0	0	0	0	0	1,850
Blackbirds (mixed)	1,217	0	0	0	0	0	1,217
House Sparrow	18	0	0	0	0	0	18
Feral Chickens	1	1	0	0	0	0	2
Feral Duck	0	0	0	0	0	1	1

^aOther methods could include non-chemical methods such as hand-capture, rocket net, and/or cannon net. All methods employed were discussed in Appendix B of the EA.

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

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 wildlife that are habitually identified as causing damage or posing a threat to human safety.

WS' Bird Damage Management Activities in Kentucky 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 from several bird species in Kentucky. WS received requests for technical assistance involving at least 31 species of birds in FY 2007 while requests for direct operational assistance by WS involved at least 25 species of birds. Requests for technical assistance received by WS during FY 2007 are shown in Table 13 by resource category.

Table 13 – 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	
Great Blue Heron	6	0	2	0	8	Great Horned Owl	2	0	2	1	5
Cattle Egret	0	0	0	1	1	Red-headed Woodpecker	0	0	3	0	3
Black-crowned night heron	0	0	8	0	8	Downy Woodpecker	0	0	4	0	4
Black Vulture	13	0	17	3	33	Pileated Woodpecker	0	0	1	0	1
Turkey Vulture	0	0	18	3	21	Cliff Swallow	0	0	1	0	1
Canada Goose	8	10	75	16	109	Barn Swallow	0	0	2	1	3
Mute Swan	0	0	1	1	2	American Robin	0	0	2	0	2
Wood Duck	0	0	0	1	1	Northern Mockingbird	0	0	2	1	3
Mallard	0	2	21	11	34	European Starling	4	0	23	10	37
Cooper's Hawk	2	0	0	0	2	Cedar Waxwing	0	0	0	1	1
Red-shouldered Hawk	0	0	0	1	1	Red-winged Blackbird	3	0	0	0	3
Red-tailed Hawk	3	2	18	10	33	Common Grackle	0	0	0	1	1
Wild Turkey	0	0	1	0	1	Blackbirds (mixed)	0	0	2	2	4
Ring-billed Gull	0	0	0	2	2	House Sparrow	0	0	2	3	5
Herring Gull	0	0	0	1	1	Feral Ducks	0	0	3	0	3
Rock Pigeon	0	0	15	12	27	Bird (Unknown)	0	0	0	2	2
Mourning Dove	0	0	0	5	5	TOTAL	41	14	223	89	367

^aA=agricultural resources, N=Natural Resources, P=Property, H=Human Safety

As shown in Table 13, a total of 367 technical assistance projects were conducted by WS in Kentucky 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 Canada geese. WS conducted 109 technical assistance projects involving geese in FY 2007 which was an increase of nearly 40% compared to the number of projects conducted in FY 2006 involving geese. WS conducted four technical assistance projects in FY 2007 involving flocks of mixed blackbird species compared to 39 projects conducted in FY 2006. The number of requests for assistance to reduce or prevent damage or threats associated with mallards increased nearly 42% in FY 2007 compared to the number of projects conducted for mallards in FY 2006.

WS continued to receive requests to conduct direct operational assistance in FY 2007 involving damage and threats associated with birds in Kentucky. WS addressed at least 25 bird species during direct operational assistance activities in FY 2007 (see Table 14). Similar to previous years, European starlings and flocks of mixed blackbird species were the two bird species most often addressed. WS addressed over 1.1 million starlings in FY 2007 using non-lethal dispersal methods which was an increase of 112% when compared to the number of starlings addressed using non-lethal methods in FY 2006. WS also employed pyrotechnics and other noise producing methods to disperse 15,680 blackbirds in FY 2007 compared to 879,973 blackbirds addressed in FY 2006. Overall, WS dispersed 1,169,296 birds in FY 2007 using non-lethal harassment methods, primarily pyrotechnics and other noise producing methods.

WS also used lethal methods to take 8,425 birds in FY 2007 which was a decrease of nearly 33% when compared to the number of birds taken by WS in FY 2006.

Table 14 – Number of birds dispersed and taken in Kentucky by WS during FY 2007

Species	Dispersed	Take	Species	Dispersed	Take
Great Blue Heron	5	2	Herring Gull	152	0
Great Egret	8	3	Rock Pigeon	52	2,449
Black Vulture	174	23	Mourning Dove	7,725	340
Turkey Vulture	1,099	82	Common Nighthawk	2	0
Canada Goose	177	144	American Crow	907	6
Mallard	210	32	American Robin	50	0
Osprey	0	3	European Starling	1,142,279	4,462
Cooper's Hawk	1	4	Red-winged Blackbird	110	61
Red-tailed Hawk	89	36	Eastern Meadowlark	12	10
American Kestrel	11	7	Brown-headed Cowbird	300	135
Killdeer	56	54	Blackbirds (mixed)	15,680	405
Common Snipe	8	0	House Sparrow	0	144
Ring-billed Gull	189	22	Feral Duck	0	1
			TOTAL	1,169,296	8,425

In FY 2007, WS used lethal methods to take 4,462 starlings and 2,449 pigeons to alleviate damage and reduce threats which accounted for 82% of the birds taken in FY 2007. Starlings and pigeons are non-native species in Kentucky 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 Kentucky during their migration. To reduce threats of aircraft strikes, WS employed an integrated approach to resolving those threats that included dispersing 7,725 doves and lethally removing 340. Of the doves addressed by WS in FY 2007, 92% were non-lethal dispersed from airfields using harassment methods. Despite the take of 4,462 starlings by WS, an integrated approach employed non-lethal methods to disperse 1,142,279 starlings in the State. Nearly 84% of the birds lethally taken by WS in FY 2007 were non-native bird species in Kentucky.

Table 15 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 were the primary method used to lethally take birds in Kentucky. Firearms are selective for target species since targets are identified prior to application. WS also employed live-traps to capture 2,045 pigeons, ten geese, and one Cooper's hawk in FY 2007.

Chemical methods employed included the use of DRC-1339 which resulted in the take of 2,737 starlings and 177 pigeons. Avitrol was also used by WS to take 11 starlings in FY 2007. Alpha-chloralose was used to live capture 102 geese and one feral duck during FY 2007. Geese live-captured using alpha-chloralose and the feral duck were euthanized using carbon dioxide or cervical dislocation which are euthanasia methods considered acceptable by the AVMA. All chemical methods employed by WS were registered for use in Kentucky by the EPA and by the Kentucky Department of Agriculture. WS use of alpha-chloralose occurs under an Investigational New Animal Drug permit issued to WS by the United States Food and Drug Administration for the live-capture of waterfowl and pigeons.

Table 15 – WS' Take of bird species in Kentucky by method during FY 2007

SPECIES	METHOD						TOTAL
	Firearm	Trap	AC	DRC-1339	Avitrol	Other ^a	
Great Blue Heron	2	0	0	0	0	0	2
Great Egret	3	0	0	0	0	0	3
Black Vulture	23	0	0	0	0	0	23
Turkey Vulture	82	0	0	0	0	0	82
Canada Goose	22	10	102	0	0	10	144
Mallard	32	0	0	0	0	0	32
Osprey	0	0	0	0	0	3	3
Cooper's Hawk	3	1	0	0	0	0	4
Red-tailed Hawk	36	0	0	0	0	0	36
American Kestrel	7	0	0	0	0	0	7
Killdeer	54	0	0	0	0	0	54
Ring-billed Gull	22	0	0	0	0	0	22
Rock Pigeon	219	2,045	0	177	0	8	2,449
Mourning Dove	340	0	0	0	0	0	340
American Crow	6	0	0	0	0	0	6
European Starling	1,696	0	0	2,737	11	18	4,462
Red-winged Blackbird	61	0	0	0	0	0	61
Eastern Meadowlark	10	0	0	0	0	0	10
Brown-headed Cowbird	135	0	0	0	0	0	135
Blackbirds (mixed)	405	0	0	0	0	0	405
House Sparrow	103	0	0	0	0	41	144
Feral Duck	0	0	1	0	0	0	1

^aOther methods could include non-chemical methods such as mist nets, hand-capture, rocket net, and/or cannon net.

WS' Bird Damage Management Activities in Kentucky during FY 2008

WS continued to receive requests for assistance to manage damage and threats associated with birds in Kentucky during FY 2008. To respond to those requests for assistance, WS provided both technical assistance and direct operational assistance through the recommendation or direct use of damage management methods. To effectively resolve requests for assistance, WS continued to employ methods in an integrated approach using both lethal and non-lethal methods to resolve or prevent damages and threats associated with birds.

WS conducted a total of 363 technical assistance projects in FY 2008 by providing information on damage management activities that could be employed by those requesting assistance without WS' direct involvement in resolving the damage or threat. Similar to FY 2006 and FY 2007, the highest number of technical assistance projects conducted by WS in FY 2008 involved providing information on resolving damage and threats associated with Canada geese (see Table 16). WS conducted 89 technical assistance projects in FY 2008 involving damages or threats associated with geese. WS also conducted 70 technical assistance projects involving damage or threats associated with European starlings. The number of technical assistance projects conducted in FY 2008 involving starlings increased over 89% compared to the number of projects conducted in FY 2007. Technical assistance projects were conducted for at least 28 species of birds in FY 2008. Similar to previous years, requests for assistance were received primarily to resolve damage to property and to reduce threats to human safety in FY 2008 accounting for over 89% of the technical assistance requests received.

Table 16 – Technical assistance projects conducted by WS during FY 2008 by species and resource

Species	A	N	P	H	Total	Species	A	N	P	H	Total
Common Loon	0	0	0	1	1	Downy Woodpecker	0	0	4	0	4
American White Pelican	0	0	1	0	1	Pileated Woodpecker	0	0	3	0	3
Great Blue Heron	3	0	0	0	3	American Crow	0	0	4	3	7
Black-crowned Night Heron	0	0	10	10	20	Purple Martin	0	0	1	0	1
Black Vulture	11	0	15	4	30	American Robin	0	0	1	0	1
Turkey Vulture	4	0	8	4	16	Northern Mockingbird	0	0	1	1	2
Canada Goose	11	0	55	23	89	European Starling	2	0	40	28	70
Mallard	0	0	28	4	32	Red-winged Blackbird	1	0	0	0	1
Cooper's Hawk	0	0	1	2	3	Common Grackle	0	0	2	0	2
Red-tailed Hawk	5	0	18	11	34	Brown-headed Cowbird	1	0	0	0	1
Wild Turkey	0	0	1	1	2	Blackbirds (mixed)	1	0	1	2	4
Rock Pigeons	0	0	15	7	22	House Sparrow	0	0	2	1	3
Mourning Dove	0	0	0	1	1	Feral Ducks	0	0	3	0	3
Great Horned Owl	0	0	2	1	3	Feral Geese	0	0	3	0	3
Red-headed Woodpecker	0	0	1	0	1	TOTAL	39	0	220	104	363

^aA=agricultural resources, N=Natural Resources, P=Property, H=Human Safety

Table 17 shows the number of birds addressed by WS as part of an integrated approach to resolving requests to manage damage or threats in Kentucky during FY 2008 through direct operational assistance. WS addressed at least 24 species of birds during FY 2008 through direct operational assistance which was similar to the number of species addressed in FY 2007. WS employed non-lethal methods to disperse 930,652 birds in FY 2008 using pyrotechnics and other noise producing methods. WS used non-lethal methods to disperse 508,835 starlings in FY 2008 compared to over 1.1 million addressed with non-lethal methods in FY 2007. The number of blackbird flocks with mixed species addressed in FY 2008 using non-lethal methods increased to 145,725 blackbirds compared to 15,680 blackbirds addressed in FY 2007.

Table 17 - Number of birds dispersed and taken in Kentucky by WS during FY 2008

Species	Dispersed	Take	Species	Dispersed	Take
Double-Crested Cormorant	2,000	30	Rock Pigeon	71	2,017
Great Blue Heron	2	3	Mourning Dove	14,112	548
Black Vulture	744	41	American Crow	880	4
Turkey Vulture	1,239	37	Horned Lark	50	0
Canada Goose	271	170	Purple Martin	255,655	0
Mallard	66	29	Barn Swallow	0	2
Northern Harrier	0	1	American Robin	10	0
Cooper's Hawk	0	1	European Starling	508,835	6,637
Red-tailed Hawk	22	16	Red-winged Blackbird	10	53
American Kestrel	0	4	Eastern Meadowlark	0	3
Wild Turkey	22	0	Blackbirds (mixed)	145,725	35
Killdeer	38	74	House Sparrow	0	1
Ring-billed Gull	900	56	TOTAL	930,652	9,762

WS also dispersed 255,655 purple martins in FY 2008 to reduce threats to aircraft from bird strikes. WS did not receive requests for martins in FY 2007. Martins were not addressed in previous years except in FY 2004 when 18,050 martins were non-lethally harassed. WS continued to receive requests for

assistance to reduce threats to aircraft associated with large flocks of mourning doves in FY 2008. WS used pyrotechnics and other noise-producing methods to disperse 14,112 doves in Kentucky.

Of the birds addressed in Kentucky during FY 2008 by WS, 99% were non-lethally harassed to resolve requests for assistance. To reinforce non-lethal methods to reduce habituation and to address birds identified as posing a consist threat or identified as repeatedly causing damage, WS employed lethal methods that resulted in the take of 9,762 birds in FY 2008. Nearly 89% of those birds were European starlings and rock pigeons which are both non-native bird species to North America. Firearms and the avicide DRC-1339 were the methods primarily used to take starlings to resolve requests for assistance (see Table 18). A total of 6,637 starlings and 2,017 pigeons were lethally taken in Kentucky during FY 2008.

Firearms were the primary methods employed to lethally take birds in FY 2008. Firearms can reinforce non-lethal methods and the noise produce can effectively disperse additional birds when employed. Traps were also employed in FY 2008 to live-capture birds, primarily pigeons. Canada geese were also live-captured in walk-in traps during their primary feather molt. A total of 90 Canada geese were live-captured and subsequently euthanized by carbon dioxide or cervical dislocation during FY 2008. In addition, 797 pigeons were live-captured and subsequently euthanized by carbon dioxide or cervical dislocation to resolve damages and threats. The immobilizing drug alpha-chloralose was also employed in FY 2008 by WS to live-capture 50 geese which were subsequently euthanized by carbon dioxide. The avicide DRC-1339 was employed according to label requirements by WS in FY 2008 to take 131 pigeons and 4,498 starlings. Avitrol was also employed in FY 2008 which resulted in the lethal take of 56 ring-billed gulls and five starlings.

Table 18 – WS’ Take of bird species in Kentucky by method during FY 2008

SPECIES	METHOD						TOTAL
	Firearm	Trap	AC	DRC-1339	Avitrol	Other	
Double-Crested Cormorant	30	0	0	0	0	0	30
Great Blue Heron	3	0	0	0	0	0	3
Black Vulture	41	0	0	0	0	0	41
Turkey Vulture	37	0	0	0	0	0	37
Canada Goose	24	90	50	0	0	6	170
Mallard	29	0	0	0	0	0	29
Northern Harrier	1	0	0	0	0	0	1
Cooper’s Hawk	1	0	0	0	0	0	1
Red-tailed Hawk	16	0	0	0	0	0	16
American Kestrel	4	0	0	0	0	0	4
Killdeer	74	0	0	0	0	0	74
Ring-billed Gull	0	0	0	0	56	0	56
Rock Pigeon	1,077	797	0	131	0	12	2,017
Mourning Dove	548	0	0	0	0	0	548
American Crow	4	0	0	0	0	0	4
Barn Swallow	2	0	0	0	0	0	2
European Starling	2,133	0	0	4,498	5	1	6,637
Red-winged Blackbird	53	0	0	0	0	0	53
Eastern Meadowlark	3	0	0	0	0	0	3
Blackbirds (mixed)	35	0	0	0	0	0	35
House Sparrow	1	0	0	0	0	0	1

^aOther methods could include non-chemical methods such as hand-capture, rocket net, and/or cannon net. All methods employed were discussed in Appendix B of the EA.

IX. 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 Kentucky were developed by WS in consultation with the USFWS, the KDFWR, and the Kentucky Department of Agriculture.

The EA fully describes the issues identified during the scoping process for WS' programmatic FEIS and during the development of the EA. The following issues were identified as important to the scope of the analysis (40 CFR 1508.25):

Issue 1 - Effects on Wildlife

A common concern when addressing damage associated with a wildlife species is the effects on the populations of those species from methods used to manage damage associated with target species. The integrated approach of managing damage associated with birds 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, no adverse affects are 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).

Breeding Bird Survey

Bird populations can be monitored by using trend data from the Breeding Bird Surveys (BBS) which are conducted annually in the U.S., across a large geographical area, under standardized survey guidelines. The BBS is a large-scale inventory of North American birds coordinated by the U.S. Geological Survey, Patuxent Wildlife Research Center (Sauer et al. 2008). The BBS is a combined set of over 3,700 roadside survey routes primarily covering the continental U.S. and southern Canada. The BBS was started in 1966 with routes surveyed in June by experienced birders. The primary objective of the BBS has been to generate an estimate of population change for all breeding birds. Populations of birds tend to fluctuate, especially locally, as a result of variable local habitat and climatic conditions. Trends can be determined using different population equations and statistically tested to determine if a trend is statistically significant.

Estimates of population trends from BBS data are derived primarily from route-regression analysis (Geissler and Sauer 1990) and are dependent upon a variety of assumptions (Link and Sauer 1998). The statistical significance of a trend for a given species is reflected in the calculated P-value (i.e., the

probability of obtaining the observed data or more extreme data given that a hypothesis of no change is true). The level of statistical significance (e.g. 0.01, 0.05, 0.10) can vary and is often set by those conducting the analysis. Often BBS or other geographically large survey (e.g., Christmas Bird Count, Breeding Plot Survey) data is not statistically significant at the local level because of relatively smaller sample size (i.e., fewer routes surveyed), more routes with zero observations of a particular bird species which results in larger statistical variance, and low P-values set for statistical significance. The BBS has a statistical level of significance set at $P < 0.01$.

The BBS data is best used to monitor population trends. To use these population trends the following assumptions would need to be accepted:

- All birds within a quarter mile of the observer are seen at all stops on a BBS route; this assumption is faulty because observers often cannot see a quarter mile in radius at all stops due to obstructions such as hills, trees, and brush and because some bird species can be very elusive. Therefore, the number of birds seen per route would provide a conservative estimate of the population.
- The chosen survey routes are totally random and are fully representative of available habitats. When BBS routes are established, survey rules allow the observers to make stops for surveys based on better quality habitat or convenient parking areas, even though the survey sites are supposed to be spaced a half-mile apart. Therefore, if survey areas had stops with excellent food availability, the count survey could be biased. This would tend to overestimate the population. However, if these sites were not on a route at all, the population could be underestimated.
- Birds are equally distributed throughout the survey area and routes were randomly selected. Routes are randomly picked throughout the state, but are placed on the nearest available road. Therefore, the starting point is picked for accessibility by vehicle. However, a variety of habitat types are typically covered since most BBS routes are selected because they are away from large concentrations of human habitation to allow observers to hear birds without interruption from vehicular noise.

Christmas Bird Count

The Christmas Bird Count (CBC) is conducted during a single 24-hour day between December 14 and January 5 annually by numerous volunteers under the guidance of the National Audubon Society (NAS). A count occurs within a 15-mile diameter circle from a center point where the number and species of birds are recorded. The CBC reflects the number of birds frequenting the state during the winter months. The CBC data does not provide a population estimate, but can be used as an indicator of trends in the population. Researchers have found that population trends reflected in CBC data tend to correlate well with those from censuses taken by more stringent means (NAS 2002).

Bird Population Trends and Estimates

BBS trend data (Sauer et al. 2008), CBC trend data (NAS 2002), and population estimates from the Partners in Flight landbird population database (Rich et al. 2004) which were derived from several sources are presented in Table 19 for those species that were lethally taken during WS' damage management activities from FY 2003 to FY 2008 in Kentucky. As shown in Table, BBS data reflects trends from 1966 through the 2007 survey, the CBC data reflects trend data from 1966 through the 2007-2008 survey, and the population estimates in Kentucky which were derived from BBS data based on guidelines published in Rich et al. (2004).

Table 19 – Population data for bird species lethally taken in Kentucky by WS

Species	KY BBS	Eastern U.S. BBS	U.S. BBS	KY CBC	U.S. CBC	Population Estimate in Kentucky
Horned Grebe	N/A*	N/A	-2.3%	Increasing	Decreasing	N/A
Double-crested Cormorant	N/A	4.3%	5.1%	Increasing	Increasing	N/A
Great Blue Heron	7.4%	2.0%	2.1%	Increasing	Increasing	N/A
Great Egret	15.4%	2.3%	2.3%	N/A	Increasing	N/A
Green Heron	-2.8%	-1.6%	-1.4%	N/A	Increasing	N/A
Black-crowned Night Heron	N/A	-5.7%	1.7%	Increasing	Stable	N/A
Black Vulture	4.5%	2.9%	3.2%	Increasing	Increasing	3,000
Turkey Vulture	1.4%	3.4%	1.6%	Increasing	Increasing	22,000
Canada Goose	34.6%	15.0%	6.9%	Stable	Stable	N/A
Wood Duck	5.2%	3.7%	3.2%	Stable	Increasing	N/A
Mallard	11.1%	2.3%	2.0%	Stable	Decreasing	N/A
Blue-winged Teal	N/A	-3.4%	-0.3%	Stable	Increasing	N/A
Greater Scaup	N/A	N/A	N/A	Stable	Decreasing	N/A
Osprey	N/A	4.8%	5.7%	N/A	Increasing	500
Northern Harrier	N/A	0.8%	-1.1%	Cyclical	Stable	N/A
Cooper's Hawk	11.2%	8.4%	6.9%	Increasing	Increasing	30,000
Red-shouldered Hawk	6.2%	2.3%	3.2%	Cyclical	Increasing	8,000
Red-tailed Hawk	2.9%	2.9%	2.4%	Increasing	Increasing	13,000
American Kestrel	-0.6%	-0.2%	-0.3%	Increasing	Stable	77,000
Wild Turkey	18.3%	13.9%	12.6%	Increasing	Increasing	9,000
American Coot	N/A	-4.8%	0.9%	Cyclical	Stable	N/A
Killdeer	0.8%	0.1%	0.0%	Increasing	Stable	N/A
Ring-billed Gull	N/A	1.8%	2.6%	Increasing	Increasing	N/A
Rock Pigeon	-2.1%	-0.4%	-0.5%	Increasing	Stable	200,000
Mourning Dove	0.4%	0.5%	-0.1%	Increasing	Increasing	1,600,000
Barn Owl	N/A	-16.9%	-2.2%	Cyclical	Increasing	N/A
Great-horned Owl	-0.7%	-1.4%	0.0%	Increasing	Decreasing	15,000
American Crow	0.5%	0.8%	0.8%	Decreasing	Increasing	460,000
Horned Lark	-5.9%	-1.8%	-1.8%	Stable	Cyclical	18,000
Barn Swallow	-0.6%	-0.9%	-0.3%	N/A	Increasing	1,000,000
American Robin	1.9%	0.5%	0.6%	Cyclical	Cyclical	4,200,000
European Starling	0.4%	-0.9%	-0.6%	Decreasing	Decreasing	3,300,000
Northern Cardinal	0.0%	0.0%	0.2%	Stable	Decreasing	3,100,000
Red-winged Blackbird	-0.4%	-1.4%	-0.9%	Decreasing	Decreasing	2,100,000
Eastern Meadowlark	-2.2%	-3.2%	-2.9%	Decreasing	Decreasing	350,000
Common Grackle	-2.1%	-1.0%	-1.0%	Decreasing	Decreasing	3,100,000
Brown-headed Cowbird	-0.4%	-1.8%	0.8%	Decreasing	Decreasing	630,000
House Sparrow	-2.9%	-2.8%	-2.6%	Decreasing	Decreasing	1,100,000

*N/A=Information is unavailable due to timing of surveys and the absence of individuals of those species during surveys in the state or region (e.g., horned grebes do not breed in Kentucky and therefore, would not appear on the BBS).

Target Species Population Impact Analysis

The EA and the supplement to the EA concluded that the effects of WS' damage management activities in Kentucky would not negatively impact the overall survival of those populations of bird species addressed in the EA and the supplement when damage management activities occurred within the scope analyzed. WS' lethal take of bird species to alleviate damage and threats to human safety were within the estimated level of lethal take analyzed in the EA and the supplement to the EA from FY 2003 through FY 2008, except for the take of Canada geese that occurred in FY 2004 and FY 2008, the lethal take of black-

crowned night herons in FY 2003 and FY 2004, the lethal take of red-tailed hawks, and the lethal take of American kestrels in FY 2004. Take occurred above the levels analyzed in the EA but were within limits of the depredation permits issued to WS' or permits issued to WS' cooperators by the USFWS. The USFWS is the federal agency with responsibility for managing migratory birds which was authorized by the MBTA (16 U.S.C. 703 et seq.). The lethal take of birds can only occur after a depredation permit has been issued by the USFWS pursuant to the MBTA under Part 21 of title 50 of the Code of Federal Regulations or under subpart D which allows the take of certain bird species to occur under certain circumstance without a depredation permit and are referred to as depredation orders. Therefore, the issuance of depredation permits by the USFWS facilitates that take of bird species and would not occur without the issuance of a permit and unless appropriate analysis of take occurred to ensure the viability of those bird species.

Analyses conducted during the annual monitoring of WS' activities determined that WS' increased take of Canada geese, red-tailed hawks, American kestrels, and black-crowned night herons were not negatively impacting populations based on the best available information on those species' populations. The USFWS permitting the take of those species 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 State.

WS' damage management activities were site specific, and although local populations of target bird 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 target bird species have not changed from those analyzed in the EA. All take occurred under a depredation permit issued by the USFWS pursuant to the MBTA. Since take for damage management purposes can only occur when permitted by the USFWS and take must be reported to the USFWS annually, all known sources of take are considered when establishing population objectives for birds by the USFWS. Program activities and their potential impact on target bird species have not changed from those analyzed in the EA. The effects on this issue are expected to remain insignificant.

Non-target Wildlife Impact Analysis

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. 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 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).

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. In FY 2003 and FY 2004, no non-target species were live-captured or lethally taken during WS' bird damage management activities in Kentucky. In FY 2005, two mourning doves were live-captured in a walk-in cage trap and were subsequently released unharmed. During FY 2006, one great horned owl and one passerine¹³ (Order Passeriformes) were live-captured in walk-in cage traps and were subsequently released unharmed. A total of five mourning doves and one common grackle were unintentionally live-captured in walk-in traps in FY 2007 and were released unharmed. Two mourning doves were unintentionally lethally taken in cage traps and one mallard was unintentionally taken with alpha-chloralose in FY 2007. During FY 2008, five mourning doves, three Cooper's hawk, and one broad-winged hawk were live-captured in cage traps and were subsequently released unharmed.

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. As previously discussed, cage traps were the primary method in which non-targets were unintentional captured. Since cage traps live-capture wildlife, non-targets can be freed unharmed. The continued use of cage traps is expected to have minimal impacts on populations of non-target wildlife that may be unintentionally live-captured since non-target wildlife can be released unharmed.

Threatened and Endangered Species Analysis

A review of threatened and endangered (T&E) species listed by the USFWS and the KDFWR showed that additional listings of T&E species has occurred since the completion of the EA in October 2000 and the completion of the supplement to the EA in February 2003. Additional mammal species listed as threatened and endangered in Kentucky since the Decision/FONSI was signed for the supplement to the EA in 2003 include the eastern cougar (*Felis concolor cougar*) and the gray wolf (*Canis lupus*). Other

¹³WS current information management systems currently does not allow for documenting birds by species for all passerine birds.

species include the Eskimo curlew (*Numenius borealis*) and the scaleshell mussel (*Leptodea leptodon*). The gray wolf, Eskimo curlew, and scaleshell mussel are listed in Kentucky 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 conducted in the State will have no effect on those species listed in the State since completion of the EA and the supplement that are not known to occur in the State. After review of bird damage management activities, WS has also determine that activities conducted pursuant to the EA and the supplement to the EA will have no effect on the eastern cougar.

WS' program activities in Kentucky to manage damage caused by birds has not changed from those described in the EA and the supplement to the EA. Thus, WS' determination of that bird damage management activities will have no effect on those species addressed in the EA and the supplement that were not addressed in the Biological Opinion issued by the USFWS on WS' programmatic activities is still valid and appropriate for the proposed action. A review of those species listed in Kentucky and discussed in the EA and supplement that were addressed in the Biological Opinion by the USFWS indicates that WS' bird damage management activities will continue to have no adverse affects on those species addressed in the Biological Opinion. 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.

Issue 2 - Effects on Human Health and Safety

Based on the analyses in the EA, the supplement to the EA, and WS' programmatic FEIS, when those activities are conducted according to WS' directives and standard operating procedures, according to federal, state, and local laws, and to label requirements, those activities pose minimal risks to human safety (USDA 1997, USDA 2000, USDA 2003). The analyses in the EA and the supplement to 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. Aircraft striking birds can lead to extensive damage to aircraft and can threaten passenger safety.

WS' activities to reduce or alleviate bird damage in Kentucky did not cause any adverse impacts to human health and safety. Program activities and methods, and their potential impacts on human health and safety have not changed from those analyzed in the EA. Impacts of the program on this issue are expected to remain insignificant.

Issue 3 – Effects on Aesthetics

As described in the EA and the supplement, 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 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.

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 Kentucky will still remain if a reasonable effort is made to locate birds outside the area in which damage management activities occurred.

The EA concluded the effects 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 Kentucky 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.

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.

Program activities and methods, and their potential impacts to stakeholders and aesthetics have not changed from those analyzed in the EA. Impacts of the program on this issue are expected to remain insignificant.

Issue 4 - Humaneness of Lethal Bird Control Methods

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 minimizes 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. Methods used in bird damage management activities in Kentucky since the completion of the EA and their potential impacts on humaneness and animal welfare have not changed from those analyzed in the EA. 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 have not changed from those analyzed in the EA.

X. ISSUES NOT CONSIDERED IN DETAIL

WS has reviewed the issues not considered in detail as described in the EA and has determined that the analysis provided in the EA has not changed and is still appropriate. Effects on those issues continue to be insignificant.

XI. ALTERNATIVES ANALYZED IN DETAIL

The EA contains a detailed description and discussion of the alternatives and the effects of the alternatives on the issues identified (USDA 2000, 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. WS has reviewed the alternatives analyzed and determined the analyses in the EA are still appropriate for those alternatives.

The following four alternatives were developed to respond to the issues:

Alternative 1: Continue the Current Federal Bird Damage Management Program (No Action/Proposed Action)

Alternative 2: Non-lethal Bird Damage Management Only By WS

Alternative 3: Technical Assistance Only

Alternative 4: No Federal WS Bird Damage Management

XII. ALTERNATIVES CONSIDERED BUT NOT ANALYZED IN DETAIL

Several alternatives were also considered to address the issues but were not analyzed in detail with the rationale discussed in the EA (USDA 2000). WS has reviewed the alternatives analyzed but not in detail and determined the analyses in the EA are still appropriate for those alternatives considered.

XIII. PIGEON DAMAGE MANAGEMENT METHODS

Since the completion of the EA, a product with the reproductive inhibitor known as nicarbazin has been registered for use in Kentucky 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 coccidiosis¹⁴ 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 FIFRA under the trade name OvoControl[®] P (Innolytics, LLC, Rancho Sante Fe, CA). OvoControl[®] P (EPA Reg. No. 80224-1) is a restricted use pesticide

¹⁴Coccidiosis 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 2000).

registered for use in Kentucky 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.

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 Kentucky since WS' activities will not be additive to those activities that could occur in the absence of WS' use of the product. 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-target 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 Kentucky 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 to enjoy 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.

XIV. ANALYSIS

WS has reviewed the potential environmental impacts and the scope of analysis contained in the EA and the supplement to the EA. The EA, the supplement to the EA, and the associated Decisions/FONSI's determined that activities conducted pursuant to and within the scope of analyses would not have significant impacts on the quality of the human environment. After review of the EA and the supplement, the associated Decisions/FONSI's, and information contained in this summary report, WS has determined that the environmental impacts on the quality of the human environment from those activities conducted pursuant to the EA and the supplement to the EA and the associated Decisions/FONSI's will continue to be insignificant and that no substantive changes in the analyses are necessary.

WS' activities in Kentucky, based on the information found within this report, fall within the scope of analysis in the EA and all take has occurred pursuant to the MBTA. No substantive changes have occurred in activities conducted or methods used since implementing the EA decision and the decision for the supplement to the EA during the reporting period. Program activities have not changed from those described and analyzed in the EA. WS will continue to conduct bird damage management activities according to those program procedures, protection measures, and mitigation factors discussed in the EA (USDA 2000).

XV. DECISION AND RATIONALE

I have carefully reviewed the EA, the comments received during the public involvement process for the pre-decisional EA, the 2000 Decision/FONSI, the supplement to the EA and the associated Decision/FONSI, and the information provided in this summary and new Decision document. I find the proposed program to be environmentally acceptable, addressing the issues and needs while balancing the environmental concerns of management agencies, landowners, advocacy groups, and the public. The analyses in the EA adequately addresses the identified issues which reasonably confirm that no significant impact, individually or cumulatively, to wildlife populations or the quality of the human environment are likely to occur from the proposed action, nor does the proposed action constitute a major federal action that would warrant the development of an EIS. Therefore, the analysis in the EA remains valid and does not warrant the completion of an EIS.

Based on the EA and the supplement to the EA, the issues identified are best addressed by continuing Alternative 1 (Proposed Action/No Action) and applying the associated mitigation measures discussed in

Chapter 4 of the EA. Alternative 1 successfully addresses (1) bird damage management using a combination of the most effective methods and does not adversely impact the environment, property, and/or non-target species, including T&E species; (2) it offers the greatest chance at maximizing effectiveness and benefits to resource owners and managers while minimizing cumulative impacts on the quality of the human environment that might result from the program's effect on target and non-target species populations; (3) it presents the greatest chance of maximizing net benefits while minimizing adverse impacts to public health and safety; and (4) it offers a balanced approach to the issues of humaneness and aesthetics when all facets of those issues are considered. Further analysis would be triggered if changes occur that broaden the scope of bird damage management activities, that affect the natural or human environment, or from the issuance of new environmental regulations.

The rationale for my decision is based on several considerations. This decision takes into account public comments, social/political and economic concerns, public health and safety, the best available science, and program activities conducted since the selected alternative was implemented. The foremost considerations are that: 1) bird damage management will only be conducted by WS at the request of landowners/managers, 2) management actions are consistent with applicable laws, regulations, policies and orders, and 3) no adverse impacts to the environment were identified in the analysis. As a part of this new Decision, the WS program in Kentucky will continue to provide effective and practical technical assistance and direct management techniques that reduce damage.

The WS program in Kentucky will implement the proposed action in compliance with all applicable standard operating procedures and minimization measures described in the EA. If no substantive issues or alternatives are identified during the public comment period, this new Decision will take effect upon the close of the public comment period after publication of a legal notice making the EA, the 2000 Decision/FONSI, the supplement to the EA, the 2003 Decision/FONSI, and this Decision available to the public for review and comment. New issues or alternatives raised after publication of public notices will be fully considered to determine whether the EA and this Decision should be revisited and, if appropriate, revised, or if a Notice of Intent to prepare an EIS should be issued.

FINDING OF NO SIGNIFICANT IMPACT

The analysis in the EA, the 2000 Decision/FONSI, the supplement to the EA, and the 2003 Decision/FONSI, and this summary report indicates that there will not be a significant impact, individually or cumulatively, on the quality of the human environment as a result of this proposed action. I agree with this conclusion and therefore find that an EIS need not be prepared. This determination is based on the following factors:

1. Bird damage management, as conducted by WS in the State of Kentucky, is not regional or national in scope. Although bird damage management projects may occur anywhere in the State, individual activities will occur at localized small-area sites.
2. Based on the analysis documented in the EA and the supplement to the EA, the proposed action would pose minimal risk to public health and safety. The proposed action is expected to result in an indirect beneficial impact on public health and safety by reducing the potential risk of transmission of disease and reduction of safety risks posed by birds, and bird droppings deposited at sites occupied by humans. Risks to the public from WS' methods were determined to be low in a formal risk assessment (USDA 1997).
3. The proposed action will not have a significant impact on unique characteristics such as park lands, prime farm lands, wetlands, wild and scenic areas, or ecologically critical areas. Built-in mitigation measures that are part of WS' standard operating procedures and adherence to laws

and regulations that govern impacts on elements of the human environment will assure that significant impacts are avoided.

4. The effects on the quality of the human environment are not highly controversial. Although there may be opposition to killing birds, this action is not controversial in relation to size, nature, or effects. Based on consultations with federal and state wildlife management authorities, the proposed action is not likely to cause a controversial disagreement among the appropriate resource professionals.
5. Mitigation measures adopted and/or described as "part of the proposed action" minimize risks to the public, prevent adverse effects on the human environment, and reduce uncertainty and risks. Effects of methods and activities, as proposed, are known and do not involve uncertain or unique risks.
6. The proposed action does not establish a precedent for future actions with significant effects. This action would not set a precedent for future bird damage management actions that may be implemented or planned within the State. Effects of the proposed action are minor and short-term in nature and similar actions have occurred previously in the State without significant effects.
7. No significant commutative effects were identified in the EA, the supplement to the EA, or this summary report. The EA and supplement to the EA discussed cumulative effects of WS' actions on target and non-target species populations and concluded that such impacts were not significant for this or other anticipated actions to be implemented or planned within the State.
8. The proposed action would not affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places and will not cause loss or destruction of significant scientific, cultural, or historic resources. Wildlife damage management would not disturb soils or any structures and therefore would not be considered a "Federal undertaking" as defined by the National Historic Preservation Act.
9. WS determined that the proposed action would not result in any adverse effects on federal or state listed threatened or endangered species.
10. The proposed action is consistent with local, state, and federal laws that provide for or restrict WS' wildlife damage management. Therefore, WS concludes that this project is in compliance with federal, state and local laws for environmental protection.



Charles S. Brown, Eastern Regional Director
USDA/APHIS/WS
Raleigh, North Carolina

4/20/09
Date

LITERATURE CITED:

Avery, M. L., K. L. Keacher, and E. A. Tillman. 2006. Development of nicarbazin bait for managing rock pigeon populations. Pp 116-120 *in* R.M. Timm and J. M. O'Brien eds. Proceedings of the 22nd Vertebrate Pest Conference. University of California-Davis, Davis California 95616.

- Avery, M. L., K. L. Keacher, and E. A. Tillman. 2008. Nicarbazin bait reduces reproduction in pigeons (*Columba livia*). *Wildlife Research* 35:80-85.
- AVMA. 2007. AVMA guidelines on euthanasia. American Veterinary Medical Association. http://www.avma.org/issues/animal_welfare/euthanasia.pdf. Accessed on March 17, 2009.
- California Department of Pesticide Regulation. 2007. California Department of Pesticide Regulation Public Report 2007-8. <http://www.cdpr.ca.gov/docs/registration/ais/publicreports/5944.pdf>. Accessed November 20, 2008.
- EPA. 2005. Pesticide Fact Sheet: Nicarbazin – Conditional Registration. United States Environmental Protection Agency, Office of Prevention, Pesticides, and Toxic Substances, Washington, DC 20460.
- Geissler, P. H. and J. R. Sauer. 1990. Topics in route-regression analysis. Pp. 54-57. *In* Survey Designs and Statistical Methods for the Estimation of Avian Population Trends. USFWS, Biol. Rep. 90(1).
- Giunchi, D., N. E. Baldaccini, G. Sbragia, and C. Soldatini. 2007. On the use of pharmacological sterilisation to control feral pigeon populations. *Wildlife Research* 34:306-318.
- Johnston, R. F. 1992. Rock Pigeon (*Columba livia*), *The Birds of North America Online* (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: <http://bna.birds.cornell.edu/bna/species/013doi:10.2173/bna.13>. Accessed on November 20, 2008.
- Link, W. A., and J. R. Sauer 1998. Estimating population change from count data: application to the North American Breeding Bird Survey. *Ecol. Applic.* 8:258-268.
- National Audubon Society. 2002. The Christmas Bird Count Historical Results [Online]. Available <http://www.audubon.org/bird/cbc>. Accessed November 20, 2008.
- Rich, T. D., C. J. Beardmore, H. Berlanga, P. J. Blancher, M. S. W. Bradstreet, G. S. Butcher, D. W. Demarest, E. H. Dunn, W. C. Hunter, E. E. Iñigo-Elias, J. A. Kennedy, A. M. Martell, A. O. Panjabi, D. N. Pashley, K. V. Rosenberg, C. M. Rustay, J. S. Wendt, T. C. Will. 2004. Partners in Flight North American Landbird Conservation Plan. Cornell Lab of Ornithology. Ithaca, NY. Partners in Flight website. http://www.partnersinflight.org/cont_plan/ (VERSION: March 2005). Accessed November 20, 2008.
- Sauer, J. R., J. E. Hines, and J. Fallon. 2008. The North American Breeding Bird Survey, Results and Analysis 1966 - 2007. Version 5.15.2008. USGS Patuxent Wildlife Research Center, Laurel, MD. Accessed November 20, 2008.
- Slate, D. A., R. Owens, G. Connolly, and G. Simmons. 1992. Decision making for wildlife damage management. *Transactions of the North American Wildlife and Natural Resources Conference* 57:51-62.
- The Wildlife Society. 1992. Conservation policies of The Wildlife Society: A stand on issues important to wildlife conservation. The Wildlife Society, Bethesda, Md. 24pp.

- USDA. 1997. Animal Damage Control Program - Final Environmental Impact Statement (revised). USDA, APHIS, WS-Operational Support Staff, 4700 River Road, Unit 87, Riverdale, MD 20737-1234.
- USDA. 2000. Environmental Assessment (EA) – Bird damage management in the Kentucky Wildlife Services Program. USDA-APHIS-WS, 537 Myatt Drive, Madison, TN 37115.
- USDA. 2003. Supplement (amendment) to the Environmental Assessment (EA) – Bird damage management in the Kentucky Wildlife Services Program. USDA-APHIS-WS, 537 Myatt Drive, Madison, TN 37115.
- USFWS. 2003. Final Environmental Impact Statement: Double-crested Cormorant Management. U.S. Dept. of the Interior, USFWS, Div. of Migratory Bird Management, 4401 N. Fairfax Drive MS 634, Arlington, VA 22203.
- USFWS. 2005. Final Environmental Impact Statement: Resident Canada Goose Management. United States Fish and Wildlife Service, Division of Migratory Birds. Arlington, VA.
<http://www.fws.gov/migratorybirds/issues/cangeese/finaleis.htm>.
- World Health Organization. 1998. Toxicological evaluation of certain veterinary drug residues in foods. World Health Organization, International Programme on Chemical Safety.
<http://www.inchem.org/documents/jecfa/jecmono/v041je10.htm>. Accessed November 20, 2008.
- Yoder, C. A., L. A. Miller, and K. S. Bynum. 2005. Comparison of Nicarbazin absorption in chickens, mallards, and Canada geese. Poultry Science 84:1491-1494.